لائحة البرامج المميزه بكلية العلوم بجامعه اسوان

بنظام الساعات المعتمدة



م	اسم البرنامج	القسم	النوع	بالانجليزيه	درجه البكالوريوس
1	الذكاء الاصطناعى وعلوم البيانات	الرياضيات	منفرد	Artificial Intelligence and Data Science	B. Sc. In Artificial Intelligence and Data Science
2	الرياضيات ودعم اتخاذ القرار	الرياضيات	منفرد	Mathematics and Decision Making Support	B. Sc. In Mathematics and Decision Making Support
3	جيولوجيا الثروات المعدنية والبترول	الجيولوجيا	منفرد	Mineral Resources and Petroleum Geology	B.Sc. In Mineral Resources and Petroleum Geology
4	بكالوريوس العلوم في الجيولوجيا الهندسية والبيئية	الجيولوجيا	منفرد	Engineering and Environmental Geology	B.Sc. In Engineering and Environmental Geology

المحتوى

المحتوى	رقم الصفحة
الفصل الأول: المقدمة (نبذة عن الكلية)	4
رؤية كلية العلوم جامعة أسوان	6
رسالة كلية العلوم- جامعة أسوان	6
الأهداف الإستراتيجية لكلية العلوم	6
مواصفات خريج كلية العلوم	7
الفصل الثاني: أحكام عامة	8
الفصل الثالث: البرامج الدراسية	30
أولا: برامج قسم الرياضيات	34
1-برنامج الذكاء الاصطناعى وعلوم البيانات	28
المحتوى العلمي لمقررات برنامج الذكاء الاصطناعى وعلوم البيانات	33
2- برنامج الرياضيات ودعم اتخاذ القرار	75
المحتوى العلمي لمقررات برنامج الرياضيات ودعم اتخاذ القرار	80
ثانيا: برامج قسم الجيولوجيا	114
1- برنامج جيولوجيا الثروات المعدنية والبترول	114
المحتوى العلمي لمقررات برنامج جيولوجيا الثروات المعدنية والبترول	119
2- برنامج بكالوريوس العلوم في الجيولوجيا الهندسية والبيئية	179
المحتوى العلمي لمقررات برنامج الجيولوجيا الهندسية والبيئية	184

الفصل الأول
مقدمـــــة
(نبذة عن الكلية)

مقدمـــــــة (نبذة عن الكلية)

- أنشئت كلية العلوم بأسوان كفرع لجامعة أسيوط بأسوان سنة ١٩٧٥.
- بدأت الدراسة في كلية العلوم بأسوان في العام الجامعي ١٩٧٦/١٩٧٧.
- بدأ التسجيل لدرجتي الماجيستير و الدكتوراه في العام الجامعي ١٩٧٧/١٩٧٨ .
- بدأ القيد في الدبلومات التطبيقية عام ١٩٨٤.
- منحت أول درجة علمية (البكالوريوس) عام ١٩٧٩.
- استحدثت الكلية دبلومة في الميكروبيولوجيا التطبيقية ودبلومة تكميلي للمعلمين في التاريخ الطبيعي وذلك تلبية لاحتياجات سوق العمل وخدمة المجتمع.
- استمرت الكلية في ريادتها الإدارية والعلمية لفرع جامعة أسيوط بأسوان حيث اعتمدت كلية التربية بالفرع وبصفة أساسية علي الأقسام العلمية لكلية العلوم.
- أصبحت كلية العلوم بأسوان منذ إنشاء جامعة جنوب الوادي عام ١٩٩٥ الحاضن والراعي الرئيسي لكليات فرع الجامعة أسوان حيث ساهمت الكلية في تشكيل الهيكل الادارى المدرب لكليات الهندسة والآداب والخدمة الاجتماعية.
- تقوم الكلية بالدور الرئيسي في تدريس مقررات العلوم الأساسية والحاسب الآلى للكليات الأخرى "التربية، الهندسة، هندسة الطاقة، الزراعة، الآثار، وغيرها" علاوة علي معهد التمريض التابع لمديرية الصحة بأسون، و كليتي الهندسة والآثار بفرع الأكاديمية البحرية بأسوان، وذلك طبقا للبرامج التعليمية بهذه الكليات والمعاهد.
- حصلت الكلية على مشروع إنشاء نظام داخلي للجودة في مايو ٢٠٠٥. ومن ثم، تم إنشاء وحدة لضمان جودة التعليم والتأهيل للإعتماد وتم اعتماد لائحتها الداخلية بمجلس الكلية بتاريخ 2008/12/2 وبقرار مجلس الجامعة بجلسته المنعقدة بتاريخ ٢٠٠٨/٨/٢٥.
- حصلت الكلية ونفذت مشروع تطوير برنامج الحاسب الآلي وبرنامج الذكاء الاصطناعى بقسم الرياضيات بالكلية في العام 2010/10/12 بدعم من وحدة إدارة المشروعات بوزارة التعليم العالي.
- سعت الكلية لإعتماد بعض الحزم البرامجية بها وقد حصل برنامج الجيولوجيا الخاص علي الإعتماد بتاريخ 2020/12/7.
- تشارك الكلية في جميع قضايا تنمية البيئة وخدمة المجتمع من خلال علاقاتها المتعددة مع ديوان عام محافظة أسوان، مكتب السيد المحافظ، جهاز شئون البيئة بأسوان، الشركة المصرية للصناعات الكيماوية "كيما" بأسوان، الشركة القابضة لمياه الشرب والصرف الصحي بأسوان ومراكزها، شركة السكر

والصناعات التكاملية المصرية بمراكز محافظة أسوان، الشركة المصرية للصناعات والسبائك الحديدية "الفيروسيليكون" بادفو، وذلك عن طريق الرسائل العلمية المقيدة بأسماء منسوبي هذه الجهات تحت إشراف أساتذة الكلية أو بإقامة الندوات والمؤتمرات وورش العمل وتقديم الإستشارات والتقارير العلمية المتخصصة.

رؤية الكلية

كلية معتمدة تقدم خريجاً مؤهلاً ومسلحاً بكافة سبل العلم الحديث من خلال برامج محدَّثة تواكب مستجدات العلم وتلبي حاجات سوق العمل، قادراً علي خدمة بيئته وتنمية مجتمعه، وراغباً في استكمال دراسته العليا بشغف ودافعية بمعونة كوكبة من هيئة التدريس ذوي التخصصات التي تغطي كافة المدارس العلمية ولهم باع واسع في الساحة العلمية المحلية والإقليمية والعالمية.

رسالة الكلية

تلتزم كلية العلوم بأسوان جامعة أسوان بمواكبة كل حديث في مجالات العلوم المختلفة وتأهيل مفردات العملية التعليمية من برامج دراسية، بنية تحتية، بنية تكنولوجية وبشرية بما يحقق رؤيتها التي تتطلع إليها مع حرصها لتكون بيت الخبرة الوافي الكافي لتلبية حاجات المجتمع رغبة في تنميته وبما يخدم المجتمع الصناعي ويحقق نهضته لخدمة الوطن.

الأهداف الأستراتيجية للكلية

1) تطوير وتعزيز الفاعلية التعليمية لكلية العلوم لتصبح مركزا علميا متميزا في مجال التعليم العالي ولديها القدرة و الإمكانيات لإعداد الكوادر البشرية التي تستطيع المنافسة إقليميا و عالمياً.
2) تطوير البيئة التعليمية بالكلية في ظل مناخ تعليمي موجه بالقيم والأخلاق السليمة وتسوده العدالة والمساواة والحرية والديمقراطية والتعاون وعدم التمييز وتتوفر فيه مبادئ الجودة والشفافية والمصداقية والتميز في الأداء.
3) تطوير ورفع كفاءة وفاعلية العملية البحثية بكلية العلوم لتصبح الكلية مركزا بحثيا متميزا يعمل على تفعيل وتنمية المشاركة والتعاون مع المؤسسات والمراكز البحثية الأخرى على المستوى المحلى والإقليمي والعالمي.

4) تعزيز القدرة المؤسسية للكلية (الإدارية والتنظيمية) وتطويرها بما يتفق مع رؤية ورسالة الكلية وغاياتها الإستراتيجية.
5) تفعيل دور الكلية في مجال المشاركة المجتمعية وتنمية البيئة وزيادة قدرتها على تسويق خدماتها التعليمية والبحثية والاستشارية.

مواصفات خريج كلية العلوم

- ✓ يستخدم تكنولوجيا المعلومات بكفاءة.
- ✓ يحدد الادوار والمسئوليات واسلوبها الأدائي المناسب.
- ✓ يفكر باستقلالية و يقدم حل المشكلات على أسس علمية سليمه.
- ✓ العمل في فريق و يحسن تنظيم الوقت و يتعاون ويتواصل مع الاخرين بإيجابية.
- ✓ يأخذ في الاعتبار المشكلات المتعلقة بالمجتمع والعادات والتقاليد.
- ✓ يكتسب مهارة التعلم و البحث المستمر.
- ✓ يستخدم الانظمة والأدوات والنماذج بطريقة فعالة.
- ✓ يسوق براءات الاختراع ويحافظ على حقوق الملكية.
- ✓ يظهر الدقة والحس الجمالي.

الفصل الثاني
أحكام عامة

الفصل الثانى

مواد لائحة البرامج الدراسيه

مادة (1): النظام الدراسي

(أ) تعتمد الدراسة بكلية العلوم جامعة أســــــــــــوان على نظام الساعات المعتمدة وتمنح جامعة أســــوان بناء على طلب مجلس كلية العلوم درجة بكالوريوس العلوم في:

1- الذكاء الاصطناعي وعلوم البيانات B.Sc. Artificial Intelligence and Data Science-

تخصص مفرد :**Single Major** : تخصص فيه كل الساعات العلمية لتخصص علمي واحد.

2- الرياضيات ودعم اتخاذ القرار B. Sc. "Mathematics and Decision-Making Support - **تخصص مفرد**: **Single Major**: تخصص فيه كل الساعات العلمية لتخصص علمي واحد.

3- جيولوجيا الثروات المعدنية والبترول B.Sc. In Mineral Resources and Petroleum Geology - **تخصص مفرد**: Single Major: تخصص فيه كل الساعات العلمية لتخصص علمي واحد.

4- الجيولوجيا الهندسية والبيئية B.Sc. In Engineering and Environmental Geology - **تخصص مفرد** :**Single Major** : تخصص فيه كل الساعات العلمية لتخصص علمي واحد.

مادة (2): معيار الساعة المعتمدة

- **تحتسب الساعة المعتمدة خلال الفصل الدراس ي الواحد على النحو التالي :**

1- كل محاضرة نظرية مدتها ساعة واحدة أسبوعيًا تكافئ ساعة واحدة معتمدة.

2- كل فترة دراسة عملية، أو تمارين، أو تدريب صيفي، أو رحلات علمية، أو دراسة حقلية، أو أنشطة أخرى طبقا للائحة الكلية المعنية مدتها 2 أو 3 ساعات اتصال أسبوعيًا تكافئ ساعة واحدة معتمدة .

3- يسقط من حساب الساعات المعتمدة الدراسة العملية أو التمارين التي مدتها ساعة واحدة .

4- يمكن أن تكون الساعات المعتمدة في مقرر ما أن تكون نظرية فقط أو عملية فقط أو مزيج بين نظري وعملي .

5- يخصص لكل ساعة معتمدة ساعة للامتحان التحريري.

مادة (3): مدة الدراسة ومستويات الدراسة

مدة الدراسة لنيل درجة البكالوريوس في كليات العلوم هي أربع سنوات جامعية أو متى استكمل الطالب عدد الساعات المعتمدة المطلوبة للتخرج (136 ساعة) بنجاح، وتقسم هذه المدة إلى أربعة مستويات دراسية وفصل دراسي صيفي كل عام، ويشمل المستوى الواحد فصلين دراسيين يفصل بينهما عطلة نصف العام وتحدد مستويات الدارسة بعدد الساعات التي اجتازها الطالب بنجاح كما يلي:

تحدد مستويات الفرق الدراسية كما يلي :

1- **المستوى الأول (Freshman)** : الطالب الذي أكتسب صفر حتى أقل من 34 ساعة معتمدة يعتبر في المستوى الأول .
2- **المستوى الثاني (Sophomore)** :الطالب الذي أكتسب 34 حتى أقل من 68 ساعة معتمدة يعتبر في المستوى الثاني .
3- **المستوى الثالث (Junior)** : الطالب الذي أكتسب 68 حتى أقل من 102 ساعة معتمدة يعتبر في المستوى الثالث .
4- **المستوى الرابع (Senior)**: الطالب الذي أكتسب 102 حتى 136ساعة معتمدة فأكثر يعتبر في المستوى الرابع.

مادة (4): العام الأكاديمي والفصول الدراسية

أ- لنيل درجة البكالوريوس في كلية العلوم بنظام الساعات المعتمدة هي متي استكمل الطالب عدد الساعات المعتمدة المطلوبة للتخرج (136 ساعة) بنجاح وتقسم هذه المدة الي أربعة مستويات دراسية ويشمل المستوي الواحد فصلين دراسيين إلزاميين يفصل بينهما عطلة نصف العام. ويسمي الفصلين بالفصل الأول (فصل الخريف) والفصل الثاني (فصل الربيع) ومدة كل منهما سبعة عشر أسبوع ويجوز طرح فصل ثالث مكثف خلال فترة الصيف (فصل صيفي) لمدة ثمانية أسابيع ويشمل الفصل كافة أنواع ومبررات التسجيل خلال الفصل الدراسي الصيفي والمبينة في مادة (8) من اللائحة .

ب- يشمل كل فصل دراسي اول او ثاني مجموعة من الأنشطة الإدارية والتعليمية توزع على النحو التالي:

1. تجري اعمال التسجيل الأكاديمي الكترونيا في الأسبوع رقم صفر (الأسبوع الذي يسبق الفصل الدراسي) او خلال الأسبوع الأول من الفصل ويجوز اجراء تسجيل مبكر في نهاية الفصل السابق.
2. يخصص أربعة عشر أسبوعا للدراسة من كل فصل دراسي وهي الأسابيع 1-7 ورقم 9-15 2
3. يخصص الأسبوع رقم 8 لأجراء امتحانات منتصف الترم.

4. يخصص الأسبوعين رقم 16-17 لأجراء الامتحانات النهائية.
5. ويراعي تعديل هذه الأنشطة بالنسبة للفصل الصيفي في حال طرحه.

مادة (5): الفصل الدراسي الصيفي

1- يجوز لمجلس الكلية الموافقة على فتح فصل دراسي صيفي مكثف مدته 8 أسابيع شاملة الامتحانات ويسجل الطلاب المقررات الدراسية المؤجلة ومقررات الرسوب، بحد أقصى 9 ساعات معتمدة وفقا لقواعد ورسوم يحددها مجلس الكلية، بحيث يكون التسجيل في هذا الفصل اختياريا للطالب وكذلك يكون أداء هيئة التدريس المنوط به التدريس المقرر اختياريا.

2- يتم تحصيل رسوم إضافية لتسجيل مقررات الفصل الصيفي، ورسوم لإعادة الامتحان في مواد الرسوب يحدد قيمتها لكل ساعة معتمدة مجلس الكلية، يصرف منها مكافأت أعضاء هيئة التدريس والعاملين تبعا لضوابط في لائحة تنظيم أعمال الامتحانات بالجامعة.

مادة (6) شروط القبول والالتحاق

1. يشترط لقبول الطلاب بالكلية الحصول على الثانوية العامة بكافة شعبها، العلوم أو الرياضيات او الشعبة العلمية في حال دمجهما او ما يعادل ذلك من الشهادات العربية والاجنبية. ويكون القبول عن طريق مكتب التنسيق.
2. اجتياز الطالب للكشف الطبي الذي يؤكد لياقته للدراسة بالكلية.
3. يجوز قبول الطلاب الحاصلين على درجة البكالوريوس بعد موافقة مجلس الكلية ووفقا للقواعد واللوائح المنظمة لذلك.
4. يجوز لمجلس الكلية بعد موافقة مجلس القسم المختص، أن يقبل طلاباً من خريجي الكلية الراغبين في الحصول على درجة البكالوريوس في تخصص مُغاير لتخصصه الأول على أن يُقيد الطالب فى هذه الحالة بالمستوي الثاني متى كان مستوفيا لشروط القيد به كما يُشترط تفرغ الطالب للدراسة وانتظامه فيها وفقا للجدول الذي تحدده الكلية والقسم العلمي المختص.

مادة (7): متطلبات الكلية ومسار الطلاب

جدول (1): توزيع متطلبات الكلية على المستوى الأول للشعبه

شعبة : العلوم الطبيعية					
رياضيات	رياضيات	رياضيات	رياضيات	رياضيات	رياضيات
8 ساعات	8 ساعات	8 ساعات	8 ساعات	8 ساعات	8 ساعات
شعبة : العلوم الجيولوجية					
9 ساعات	5 ساعات	6 ساعات	4 ساعات	2 ساعات	2 ساعات
جيولوجيا	فيزياء	كيمياء	بيولوجي	رياضيات	حاسب

جدول (2): تحديد مسار الطلاب بالبرنامج

	القسم	التخصص/ البرنامج		English
		عربي	English	
العلوم الطبيعية	الرياضيات	الرياضيات	mathematics	Math
		الرياضيات- الحاسب الالي	Computer science	CS
		الذكاء الاصطناعي وعلوم البيانات	Ai and data science	AI&DS
		الرياضيات ودعم اتخاذ القرار	Mathematics and Decision-Making Support	MDMS
العلوم الجيولوجية	الجيولوجيا	الجيولوجيا	Geology	Geo
		الجيوفيزياء	Geophysics	Gph
		جيولوجيا وكيمياء	Geology and Chemistry	GeoChm
		جيولوجيا الثروات المعدنية والبترول	Mineral Resources and Petroleum Geology	Mrp
		الجيولوجيا الهندسية والبيئية	Engineering and Environmental Geology	Gen

في حال ضم الرياضيات والعلوم في شهادة الثانوية العامة يتم توزيع طلاب المستوى الاول حسب تنسيق داخلي يعتمد على درجات الطلاب يحدده مجلس الكلية ويعتمده مجلس الجامعة.

مادة (8) متطلبات التخرج

لاستيفاء متطلبات التخرج اللازمة لنيل درجة بكالوريوس العلوم في أي برنامج أكاديمي ذو تخصص منفرد او " رئيسي وفرعي" او مزدوج يجب علي الطالب ان يجتاز بنجاح عدد 136 ساعة معتمدة من المقررات الدراسية طبقا لتوصيات اللائحة الموحدة الصادرة من لجنة قطاع العلوم الأساسية موزعة على النحو التالي:

اولا: متطلبات الجامعة (Uni) 8 ساعات معتمدة كالتالي:

- 4 ساعات اجبارية: لدراسة اللغة الانجليزية للعلوم وتكنولوجيا المعلومات:
  1) 2 ساعة معتمدة في دراسة اللغة الإنجليزية (Uni108).
  2) 2 ساعة معتمدة في دراسة تكنولوجيا المعلومات (Uni109).
- يدرس الطالب مقرر القضايا المجتمعية (Uni107) بمعدل 2 ساعة معتمدة ويكون التقييم فيها ناجح / راسب ولا تحسب ضمن المعدل التراكمي.
- 4 ساعة اختيارية من المقررات كما موضحة بالجدول (5).

جدول (2): متطلبات الجامعة الاجباري والاختياري بالمستويات المختلفة

اولا: متطلبات الجامعه:-

مقررات المستوى الاول (الاجباري)	
Uni107 القضايا المجتمعية - Uni108 اللغة الإنجليزي للعلوم - Uni109 تكنولوجيا المعلومات	
مقررات المستوى الثاني (الاختياري) يتم اختيار مقررين بأربع ساعات فقط	
Uni 209 التغيرات المناخية.	Uni210 الابتكار وريادة الاعمال.
Uni211 تاريخ مصر القديم.	Uni218 تاريخ مصر الحديث.
Uni212 علم النفس ولاجتماع.	Uni219 الثقافة البيئية.
Uni213 تاريخ وفلسفة العلوم.	Uni220 الفلسفة والتفكير النقدي.
Uni214 مهارات البحث العلمي.	Uni221 مهارات التواصل.
Uni215 الامان المعملي.	Uni222 الصحة واللياقة.
Uni216 كتابة ونشر البحوث العلمية.	Uni223 التنوع الحيوي والتنمية المستدامة.
Uni223 أخلاقيات البحث العلمي.	Uni224 العلوم السياسية والعلاقات الدولية.

على أن يحدد مجلس الكلية في كل عام دراسي بعض المقررات الاختيارية التي يختار منها الطالب طبقا للتخصصات المتاحة ويجوز لمجلس الكلية طرح مقررات اختيارية اخرى بعد موافقة مجلس الجامعة.

ثانيا متطلبات الكلية:

مقررات علوم أساسية مساعدة او مساندة لفهم التخصص 28 ساعة اجبارية تشارك في تقديمها كل اقسام الكلية.

جدول (3): الساعات الإجبارية والاختيارية لكل نوع من البرامج المختلفة

م	نوع البرنامج	متطلبات التخصص (اجباري + اختياري)	عدد الساعات الاجبارية	عدد الساعات الاختيارية
1	منفرد	88 ساعة	60 ساعة	28 ساعة

* يضاف الى الساعات الاجبارية لجميع البرامج السابقة:

أ- (6) ساعات اختيار حر من خارج تخصص البرنامج.

ب- (3) ساعات تدريب ميداني بالمستوى الرابع بالفصل الدراسي الاول داخل مؤسسات انتاجية او أحد المراكز البحثية او الاقسام العلمية بالجامعة.

ج- مشروع تخرج (3) ساعة معتمد بالمستوى الرابع.

ح- تدريب صيفي خارجي لمده 4أسابيع بعد المستوى الاول او الثاني في أحد الاماكن التي لها علاقة بالدراسة والعمل بعد التخرج.

لا يحصل الطالب على شهادة البكالوريوس إلا إذا أدى بنجاح التدريب الميداني والصيفي.

جدول (4): بيان متطلبات الساعات المختلفة لنيل درجة البكالوريوس في العلوم في أي نوع من البرامج.

م	المتطلب	عدد الساعات			تعريف بالمتطلب	النسبة المئوية
		اجباري	اختياري	مجموع		
1	متطلبات الجامعة	4	4	8	في المستوي الأول غالبا	5.88
2	متطلبات الكلية	28	--	28	في المستوي الأول غالبا	20.59
3	متطلبات التخصص المنفرد	60	28	88	يبدأ الطالب دراستها اعتبارا من المستوي الثاني	64.71
4	متطلبات التخصص الرئيسي	46	20	66	يبدأ الطالب دراستها اعتبارا من المستوي الثاني	48.53
5	متطلبات التخصص الفرعي	16	6	22	يبدأ الطالب دراستها اعتبارا من المستوي الثاني	16.17
6	متطلبات التخصص المزدوج	30	14	44	يبدأ الطالب دراستها اعتبارا من المستوي الثاني	32.35
7	تدريب ميداني	3	--	3	تدريبات تطبيقية 8 أسابيع خلال الفصل الدراسي الاول من المستوى الرابع	2.21
8	مشروع تخرج	3	--	3	مقال او بحث معملي	2.21
9	تدريب صيفي				بعد المستوى الاول والثاني والثالث لمدة 4 اسابيع	

مادة (9): النظام الكودي للمقررات الدراسية

يتكون الرمز الكودي من 3 ارقام تســـبقها رمز القســـم العلمي الوارد في المادة 26 الذي يقدم المقرر و تراعي الدلالات الاتية في هذه الاعداد كما يلي:

أ- خانة الاحاد:

1- تدل الأرقام الفردية على المقررات الي تطرح في الفصل الدراسي الأول.

2- تدل الأرقام الزوجية على المقررات التي تطرح في الفصل الدراسي الثاني.

ويجوز للجنة شئون الطلاب طرح المقررات الزوجية او الفردية في أكثر من فصل بناء على اقتراح الاقسام .

ب-خانة الاحاد والعشرات :

- تدل على رقم المقرر.

ج-خانة المئات:

- تدل على رقم المستوى.

مادة (10) : النظام الأكاديمي والسجل الأكاديمي

1. يخصص لكل طالب مرشد أكاديمي من بين أعضاء هيئة التدريس لتوجيه الطالب دراسيا ومساعدته على اختيار المقررات الدراسية وعدد الساعات التي يسجل بها وفقا لقدراته واستعداده وظروفه.

2. يحدد القسم العلمي بالكلية لكل طالب مرشدًا أكاديميًا ويُفضل أن يكون من أعضاء هيئة التدريس من نفس التخصص كلما أمكن وذلك لتقديم النصح والارشاد خلال فترة دراسته ولمساعدته في اختيار المقررات الدراسية الاجبارية والاختيارية والحرة اللازمة لمجال تخصصه للطالب وذلك حتى نهاية دراسة الطالب للمقررات الدراسية ويجوز للطالب حرية اختيار المرشد كلما كان ذلك ممكنا.

3. يكون لكل طالب سجل بيانات لدى المرشد الأكاديمي يسجل فيه المقررات التى درسها الطالب يسمى السجل الأكاديمي وهو بيان يوضح البيانات الشخصية والمقررات الدراسية التى درسها فى كل فصل دراسى ورموزها وأرقامها والدرجات والنقاط والتقديرات التى حصل عليها ورموز التقديرات والمعدل الفصلي والتراكمي والتقديرات الفصلية ورموزها والتقدير العام حتى تخرج الطالب من الكلية والمهارات المكتسبة من مخرجات التعليم.

4. لا تقبل بطاقات التسجيل أو الإضافة أو الانسحاب إلا باعتماد المرشد الأكاديمي، وعلى الطالب الرجوع إليه لاستشارته في أموره الدراسية وتقديم النصح له لحل المشكلات التي قد تعتريه.

مادة (11): التسجيل والنقل للمستوى

أ- يتم توزيع طلاب المستوى الأول على الشعب التي تضمها اللائحة في مادة 6 طبقا لرغباتهم وفق شروط يضعها مجلس الكلية قبل بداية الدراسة.

ب- يتم تسجيل الطلاب الكترونيا قبل بداية الفصل الدراس ى ويتم الانتهاء من تسجيل المقررات في الأسبوع الأول من الدراسة ويجوز في حالة وجود أعذار قهرية أن يتم التسجيل حتى نهاية الأسبوع الرابع (الحذف والإضافة)، وفى جميع الأحوال يراعى عند تسجيل الطالب لمقرر ما، ضرورة دراسته للمتطلب السابق (مقرر أساسي لفهم محتوى المقرر الجديد تحدده اللائحة الداخلية للكلية) ان وجد.

ج- ينقل الطالب إلى المستوى الثاني إذا اجتاز 30ساعة معتمدة ويسجل في المستوى الثالث إذا اجتاز 64 ساعة معتمدة ويسجل في المستوى الرابع إذا اجتاز 100ساعة معتمدة.

مادة (12) : العبء الدراسي

يسمح لكل طالب بالتسجيل في ساعات تتراوح بين 16 و18 ساعة معتمدة لكل فصل دراسي ويستثني من ذلك الحالات الاتية: -

أ- يجوز للطالب المتفوق الحاصل على تقدير ممتاز (معدل تركمي = 3.667 على الأقل) بعد المستوي الأول ان يسجل 20 ساعة معتمدة في الفصل الدراسي الواحد.

ب- يجوز لمجلس الكلية زيادة الحد الأقصى للعبء الدراسي الي 22 ساعة معتمدة لمرة واحدة للطالب الذي اجتاز 100 ساعة معتمدة بغرض إتمام متطلبات التخرج اللازمة له.

ج- لا يسمح للطالب الذي لا يحقق معدل تراكمي 2.00 (60% من الحد الاقصى لمجموع درجات المقرر التي درسها) بالتسجيل في أكثر من 12 ساعة معتمدة بالفصل الدراسي الواحد.

د- يجوز لمجلس الكلية ان يعفي الطالب المحول من كلية مناظرة من بعض لمقررات إذا ثبت انه قد درس ونجح في مقررات تعادلها في الكلية المحول منها كما يجوز للطالب دراسة مقررات مناظرة في كلية من كليات العلوم الأخرى بجمهورية مصر العربية او الخارج لظروف يقبلها مجلس الكلية بعد اخذ راي مجلس القسم المختص.

مادة (13): الحذف والإضافة والانسحاب

أ- الإضافة او الحذف لمقرر: يجوز للطالب بتوصية من المرشد الأكاديمي ان يحذف او يضيف مقررا او أكثر

حتى نهاية الأسبوع الرابع من الدراسة (الأسبوع الثاني من الفصل الصيفي) وذلك بما لا يخل بالعبء الدراسي المنصوص عليه في المادة (10) وبما لا يزيد عن 6ساعات معتمدة في الفصل الدراسي الواحد (3 ساعات في الفصل الصيفي).

ب- يجوز ان ينسحب الطالب من دراسة أي مقرر حتى نهاية الأسبوع الثامن من بدء التسجيل للفصل الدراسي ويسجل هذا المقرر في سجل الطالب الأكاديمي بتقدير "منسحب W" بشرط ان لا يكون الطالب قد تجاوز نسبة الغياب المقررة قبل الانسحاب وتعرض حالات الانسحاب الاضطرارية بعد هذا الميعاد على لجنة شؤون التعليم والطلاب بالكلية للنظر فيها وإقرارها من مجلس الكلية على الا يخل الانسحاب بالعبء الدراسي للطالب وفقا للمادة (8).

مادة (14): تغيير او تعديل البرنامج الدراسي

أ- يجوز للطالب تغيير او تعديل برنامجه الدراسي خلال المستوي الأول والثاني بعد موافقة المرشد الأكاديمي ولجنة شؤون التعليم والطلاب ومجلس الكلية بشرط توافر أماكن شاغرة وشروط القبول في برنامج التخصص الذي يرغب في التحويل اليه.

ب- يدرس الطالب مقررات التخصص الجديد ولا تحتسب مقررات البرنامج المحول منه ضمن متطلبات التخرج ما لم تكن ضمن مقررات البرنامج الجديد.

ت- تشطب من سجل الطالب جميع المقررات التي اجتازها الطالب ما لم تكن من متطلبات البرنامج الجديد ولا يتم احتسابها في المعدل التراكمي ويجوز لمجلس الكلية فرض رسوم إضافية عن هذا التحويل.

مادة (15): المواظبة

يتولى أستاذ المقرر ومساعدوه تسجيل حضور الطلاب في بدء كل محاضرة نظرية او فترة عملية في سجل معد لذلك من قبل شؤون الطلاب مع مراعاة ما يلي:

أ- الحد المسموح به لغياب الطالب بدون عذر مقبول هو 25% من مجموع ساعات المقرر ويتولى أستاذ المقرر اخطار إدارة شؤون الطلاب لإنذار الطالب مرتين الإنذار الأول بعد تجاوز نسبة غياب 10% من ساعات المقرر والإنذار الثاني بعد تجاوز نسبة 25% وتعرض حالة الطالب علي لجنة شؤون التعليم والطلاب ويعتمد من مجلس الكلية لحرمانه من استكمال المقرر او قبول عذره ان وجد واعتباره غائب بعذر.

ب-إذا زادت نسبة الغياب عن 25% في المقرر وكان غياب الطالب بدون عذر تقبله لجنة شؤون التعليم والطلاب ويعتمد في مجلس الكلية يسجل للطالب تقدير "محروم" في المقرر وتدخل نتيجة تقدير "محروم" في حساب المعدل الفصلي والمعدل التراكمي للطالب.

ج- إذا زادت نسبة غياب الطالب عن 25% وكان غياب الطالب بعذر تقبله لجنة شؤون التعليم والطلاب ويعتمده مجلس الكلية يسجل للطالب تقدير "غائب بعذر" ولا تدخل نتيجة التقدير "غائب بعذر" في المعدل الفصلي او المعدل التراكمي العام للطالب.

مادة (16): التأجيل وعدم الاكتمال وتكرار الرسوب

1. يسمح للطالب فى بعض الحالات الخاصة وبناء على طلب منه باستكمال مقرر او أكثر بعد انتهاء الامتحانات النهائية للفصل الدراس ي وُيمنح تقدير (غير مكتمل) في هذا المقرر مع الاخذ في الاعتبار ما يلي:
2. ان يكون الطالب قد أستكمل ما لا يقل عن نسبة حضور 75%من عدد الساعات الدراسية للمقرر ويتبقى له الامتحان التحريري النهائي فقط.
3. ان يقوم الطالب بتقديم ما يثبت ويبرر طلبه في الحصول على تقدير (غير مكتمل)" I "مثل شهادة مرضية معتمدة او شهادة وفاة أحد الاقرباء من الدرجة الاولى او اية اسباب قهرية أخرى
4. ان يقوم الطالب بتقديم طلب (مقرر غير مكتمل) قبل بداية الامتحان محددا فيه سبب طلبه في الحصول على هذا التقدير ويقوم بالتوقيع على هذا الطلب كل من الطالب واستاذ المقرر والمرشد الأكاديمي ويعتمد من عميد الكلية قبل تسليمه الى قسم شئون الطلاب.
5. يعتبر التقدير (غير مكتمل)"I "تقديرا مؤقتا ولا يدخل في حساب متوسط نقاط التقدير التراكمي.
6. يتم حجب متوسط نقاط التقدير التراكمي من بيان حالة الطالب في حالة حصوله على تقدير (غير مكتمل)"I "في أي مقرر ولا يسمح له بالتسجيل في الفصل الدراس ي التالي (باستثناء الفصل الدراس ي الصيفي) الا إذا تم الغاء هذا التقدير من بيان الحالة.
7. يجب على الطالب حضور امتحان (بديل) عن الامتحان التحريري النهائي وذلك خلال اسبوعين من الفصل الدراسي التالي على ان يتم بعد ذلك تسجيل التقدير الفعلي الذي حصل عليه الطالب بدلا من التقدير (غير مكتمل)"I "وفى حالة عدم استكمال الطالب للمقرر يتم تسجيل التقدير" F "تلقائيا في بيان الحالة ونسبة مئوية تساوى 0.00% .
8. إذا تكرر رسوب الطالب في مقرر ما، تسجل عدد المرات التي درس فيها هذا المقرر في سجله الأكاديمي، وتحسب له درجة النجاح التي حصل عليها عند اجتياز الامتحان بحد أقصى B+ .

مادة (17): التقويم والدرجات

يتم تقييم الطالب بناء على العناصر التالية:

أ- التقييم المستمر ويشمل الاختبارات القصيرة الشفهية والتحريرية والتطبيقية والمقالات، والبحوث، والرحلات العلمية، والحقلية.

ب- اختبار منتصف الفصل ويعقد خلال الأسبوع الثامن من الفصل الدراسي ولمدة زمنية يحددها أستاذ المقرر ولا تزيد عن نصف زمن الساعات النظرية لهذا المقرر.

ج- الاختبار العملي النهائي ويعقد في اخر جلسة عملية.

د- الامتحان التحريري النهائي ويعقد في الأسبوعين الاخيرين من الفصل الدراسي.

ه- الزمن المخصص للامتحان التحريري النهائي لكل مقرر يساوي عدد الساعات النظرية المعتمدة وبحد أقصى ساعتين.

و- إذا اشتمل المقرر على دراسة نظرية ودراسة عملية فلابد ان يتضمن اختبار منتصف الفصل والاختبار النهائي امتحانات نظرية وعملية.

ز- يتم تقييم امتحان كل مقرر من 100 درجة بدون أي كسور ويتم تقييم الطالب في المقررات النظرية والعملية بناء على العناصر الواردة في الجدول التالي:

جدول (5):- عناصر تقيم الطالب في المقررات

نوع الامتحان	المقرر نظري وعملي	المقرر نظري فقط	المقرر عملي فقط	المقرر نظري وتمارين
امتحان نظري نهائي	**%40**	**%50**	-	**%50**
امتحان عملي نهائي	**%20**	**-**	%20	**-**
امتحان شفوي نهائي	**%10**	**%10**	%10	**%10**
امتحان منتصف الفصل	**%10**	**%20**	-	**%20**
تقييم مستمر (اختبارات دورية وتمارين .... الخ)	**%20**	**%20**	%70	**%20**
مجموع درجات الامتحان	**100**	**100**	100	**100**

1. بالنسبة للمقال المرجعي او مشروع التخرج بالمستوي الأخير والمخصص له 3 ساعات معتمدة توزع درجاته بواقع 60% علي جودة المقال (التميز العلمي للموضوع، مواكبة مستحدثات العلم، الإعداد الجيد

للبحث المعروض من حيث اللغة والتنسيق ودقة المعلومة، العرض الجيد للطالب بما يحقق ويُظهر للجنة مهارة العرض لديه) و20% للمناقشة الشفهية و20% للمشرف العلمي.

2. بالنسبة للتدريب الميداني يخصص له 3 ساعات معتمدة توزع درجاته بواقع 40% غلي جودة تقرير الطالب و40% لتقرير مشرف التدريب و20% للمناقشة. وتشكل لجنة لمناقشة الطالب تتكون من مشرف الطالب من القسم واثنان آخران من اعضاء هيئة التدريس بالقسم.
3. تتم الامتحانات الشفهية والتحريرية بواسطة لجنة من اثنين او ثلاثة من أعضاء هيئة التدريس من بينهم القائم على تدريس المقرر ويعتبر الطالب الغائب في الامتحان العملي النهائي او الامتحان التحريري النهائي غائبا في المقرر ويعتبر الطالب الحاصل علي صفر الى اقل من60% من درجة الامتحان النهائي راسبا في المقرر.

مادة (18): الدلالات الرقمية والرمزية للدرجات والتقديرات

1- يتم حساب نقاط المقرر والرموز المقابلة للدرجات الحاصل عليها في كل مقرر من الجدول التالي:

جدول (6): تحويل الدرجات الي نقاط وتقديرات ورموزها

النسبة المئوية للدرجة	رمز التقدير	عدد النقاط	التقدير Grade	
97% حتى 100%	A+	4.000	ممتاز	Excellent
93% إلى أقل من 97%	A			
89% إلى أقل من 93%	A-	3.667		
84% إلى أقل من 89%	B+	3.333	جيد جدا	Very Good
80% إلى أقل من 84%	B	3.000		
76% إلى أقل من 80%	B-	2.667		
73% إلى أقل من 76%	C+	2.333	جيد	Good
70% إلى أقل من 73%	C	2.000		
67% إلى أقل من 70%	C-	1.667		
64% إلى أقل من 67%	D+	1.333	مقبول	Pass
60% إلى أقل من 64%	D	1.000		
أقل من 60%	F	0.0	راسب	Fail

2- عند حساب معدلات الطالب التراكمية يعتد بالكسور العشرية لرقمين فقط بعد الفاصلة العشرية. وتسجل المعدلات وتحفظ لرقمين عشريين فقط. وعند حساب المعدل التراكمي للطالب عند التخرج يظهر أيضا لرقمين عشريين. ويحسب المعدل التراكمي لأوائل الدفعة لأقرب أربعة ارقام عشرية بعد الفاصلة وذلك لتحديد ترتيب الأوائل.

3- عند حساب معدلات الطالب التراكمية يعتد بالكسور العشرية لرقمين فقط بعد الفاصلة العشرية وتسجل المعدلات وتحفظ لرقمين عشرين فقط. وعند حساب المعدل التراكمي للطالب عند التخرج يظهر أيضا لرقمين عشرين. يضاف " ويحسب المعدل التراكمي لأوائل الدفعة لأقرب أربعة ارقام عشرية بعد الفاصلة وذلك لتحديد ترتيب الأوائل "

4- عند قبول العذر عن عدم دخول الامتحان النهائي لمقرر ما بموافقة مجلس الكلية يحتسب المقرر غير مكتمل ويوضع للطالب وفقا لإطار اللائحة تقدير (I) مع الاحتفاظ بدرجة اعمال السنة ويؤدي الطالب الاختبار النهائي فقط في بداية الفصل التالي ثم يوضع له التقدير النهائي بناء على مجموع درجات اعمال السنة والامتحان النهائي. وفي حالة عدم دخول الطالب الامتحان في خلال الشهر الأول من الفصل الدراسي التالي يعتبر راسب بتقدير (F).

5- المقررات ذات الطبيعة الخاصة التي تستلزم فترة زمنية أطول من فصل دراسي واحد تؤجل تقديراتها لمدة لا تتجاوز عن فصل دراسي تالي للفصل الدراسي الذي سجلت فيه ويرصد في سجل الطالب (مستمر) وعند اجتياز المقرر تعطي للطالب الدرجة المستحقة.

6- الطالب الذي يرسب في أي مقرر اجباري عليه إعادة دراسة ذلك المقرر والامتحان فيه وفي حالة رسوبه في مقرر اختياري فعليه إعادة دراسة ذلك المقرر او اختيار مقرر اخر بديل له لاستكمال متطلبات التخرج.

مادة (19): المعدل الفصلي والمعدل التراكمي

1- المعدل الفصلي: Grade Point Average (GPA)

2- هو كمتوسط ما يحصل عليه الطالب من نقاط خلال الفصل الدراسي الواحد ويحسب ويسجل لأقرب ثلاث أرقام عشرية ويتم حسابه كما يلي:

المعدل الفصلي = مجموع (نقاط كل مقرر × عدد الساعات المعتمدة للمقرر) ÷ مجموع الساعات المعتمدة المسجلة خلال الفصل الدراسي.

3- المعدل التراكمي: Cumulative Grade Point Average (CGPA)

4- هو متوسط ما حصل عليه الطالب من نقاط خلال الفترة الدراسية السابقة للحساب ويحسب ويسجل CGPA للرقم العشري الثالث ويتم حسابه كما يلي:

المعدل التراكمي = مجموع (نقاط كل مقرر × عدد الساعات المعتمدة للمقرر) ÷ مجموع عدد الساعات المعتمدة المسجلة خلال الفترة الدراسية السابقة.

الحد الأدنى للنجاح في المقرر هو حصول الطالب علي معدل 2.00 على الأقل.

الحد الأدنى للتخرج هو حصول الطالب علي معدل تراكمي 2.00 على الأقل.

مادة (20): مرتبة الشرف

تمنح مرتبة الشرف للطالب الذي ينهى دراسته بالكلية في مدة لاتزيد عن 8 فصول دراسية أساسية بتقدير ممتاز بحد أدنى 89% من المجموع الكلى للدرجات بما يحقق معدل تراكمى من النقاط قدره 3.667 أو أكثر وبشرط ألا يقل معدله التراكمى فى أى فصل دراسى عن 2.667 (76% من مجموع الدرجات) وألا يكون قد رسب فى أى مقرر دراسى خلال دراسته فى الكلية أو فى الكلية المحول منها إذا كان قد قضى مدة دراسة لا تزيد عن عامين فى كلية أخرى.

مادة (21): الانذار والمراقبة الاكاديمية

1. إذا حصل الطالب في المستوي الاول على معدل تراكمي أقل من 2 ينذر إنذارًا أول من مجلس الكلية.
2. إذا تكرر تدنى المعدل التراكمي للطالب عن 2 لفصل دراس ى ثان، ينذر إنذارا ثان ويعتبر الطالب مراقب أكاديمي ولا يسمح له بالتسجيل الا الحد الادنى للساعات وهو 12 ساعة معتمدة.
3. الطالب الذي لا يحقق معدل تراكمي 2 أو أكثر عند إتمامه متطلبات التخرج يجب عليه إعادة التسجيل في عدد من المقررات الدراسية بحد أقصى 12 ساعة معتمدة في فصل دراسي واحد ويحصل على كامل الدرجة في هذه المقررات حتى يحقق المعدل المطلوب للتخرج، ويحسب له التقدير الأعلى للمقررات التي نجح فيها ويضاف في سجله الأكاديمي بحد أقصى بتقدير +B .
4. إذا حصل الطالب على معدل تراكمي أقل من 1.7 بعد نهاية الفصل الدراسي الثاني للمستوى المقيد بها الطالب أصبح يعامل معاملة الطالب الباقي للإعادة ويجب عليه إعادة التسجيل في المقررات الدراسية التي رسب بها حتى يحقق المعدل المطلوب للنجاح في المستوى المقيد به.

مادة (22) إعادة مقرر دراسي رسب فيه الطالب

1. عند إعادة دراسة مقرر سبق أن رسب فيه الطالب، يجب علية دراسته مرة أخرى ويتم إعادة تقييم أداؤه بشكل كامل.
2. إذا نجح الطالب في المقرر بعد إعادته، يتم احتساب التقدير الجديد فقط في المعدل التراكمي بحد أقص ى بتقديرB+ ، بينما سيظهر التقدير الاقل الذي حصل عليه سابقا في سجل الدرجات الخاص بالطالب، ولكن لا يتم احتسابه في المعدل التراكمي.

3. إذا تكرر رسوب الطالب في مقرر ما، تسجل عدد المرات التي أدى فيها امتحان هذا المقرر في سجله الأكاديمي وسيظهر السجل الأكاديمي جميع محاولات إعادة دراسة المقرر. وعند نجاح الطالب في المقرر بعد هذه المحاولات، يتم احتساب التقدير الجديد فقط في المعدل التراكمي بحد أقص بتقدير **B+.**

مادة (23): إعادة دراسة مقرر دراسي لتحسين المعدل التراكمي

1. إذا رغب الطالب في إعادة دراسة مقرر دراسي سبق أن نجح فيه لتحسين المعدل التراكمي سيتم احتساب أعلى درجة حصل عليها الطالب.
2. يقوم الطالب بإعادة دراسة مقرر دراسي سبق أن نجح فيه مرة واحدة ويسمح للطالب بالتحسين بحد أقصى 5 مقررات (15 ساعة معتمدة) في خلال فترة دراسته.
3. سيتم احتساب المعدل التراكمي على هذا الاساس مع احتساب الساعات المعتمدة للمقرر مرة واحدة فقط.
4. ستظهر محاولات الاعادة والتقديرات التي حصل عليها الطالب في كل محاولة في السجل الأكاديمي الخاص بالطالب.
5. يسمح بإعادة دراسة المقررات لتحسين المعدل التراكمي على الا يؤخذ بها في احتساب قوائم الشرف أو التميز الأكاديمي، وتدرج جميع المحاولات في السجل الأكاديمي للطالب.

مادة (24): الانقطاع عن الدراسة وإلغاء القيد و الفصل

1- يجوز للطالب ان يطلب تأجيل دراسته (وقف قيده) لمدة لا تزيد عن أربعة فصول دراسية منفصلة او متصلة خلال مدة دراسته بالكلية على ان تقدم طلبات التأجيل في موعد أقصاه نهاية الأسبوع الرابع من الفصل الدراسي ويكون التأجيل نافذا بعد اخذ راي المرشد الأكاديمي ولجنة شؤون التعليم والطلاب وموافقة مجلس الكلية ومجلس الجامعة.

2- إذا انقطع الطالب الدراسة عن الكلية لمدة لا تتجاوز فصلين دراسيين لأسباب قهرية وافقت عليها لجنة شؤون التعليم والطلاب ومجلس الكلية يتاح للطالب فرصة اخري للتسجيل ويستأنف دراسته في الفصل الدراسي التالي وتحتسب مدة الانقطاع ضمن فرص التأجيل للطالب.

3- ينقل الطالب الى المستوى الثاني إذا اجتاز 30 ساعة معتمده ويسجل في المستوى الثالث إذا اجتاز 64 ساعة معتمده ويسجل في المستوى الرابع إذا اجتاز 100 ساعة معتمده.

4- يتعرض الطالب للفصل من الكلية طبقا لعدد مرات الرسوب على النحو التالي:

- يفصل طالب المستوي الأول إذا لم يجتز 30 ساعة معتمدة من المقررات التي سجل فيها وادي فيها الامتحان خلال أربعة فصول دراسية.

- يفصل طالب المستوي الثاني إذا لم يجتز 64 ساعة معتمدة من المقررات التي سجل فيها وادي فيها الامتحان خلال ثمانية فصول دراسية مع إعطاء الطالب فرصة امتحان من الخارج بعد فصل دراسي تاسع بمصروفات يحددها مجلس الكلية ولمرة واحدة.
- يفصل طالب المستوي الثالث إذا لم يجتز 100 ساعة معتمدة من المقررات التي سجل فيها وادي فيها الامتحان خلال عشرة فصول دراسية مع إعطاء الطالب فرصة امتحان من الخارج بعد فصل دراسي حادي عشر بمصروفات يحددها مجلس الكلية ولمرة واحدة.

مادة (25): نظام الاستماع والطالب الزائر

1- يجوز لمجلس الكلية بعد اخذ رأي مجالس الأقسام العلمية المختصة ان يقبل طلاب من كليات الجامعة او الجامعات الأخرى كمستمعين لبعض مقررات بالكلية وفقا لقواعد يحددها مجلس الكلية ويوافق عليها مجلس الجامعة وتمنح الكلية افادة حضور هذه المقررات للطالب.

2- كما يجوز قبول طلاب زائرين من كليات اخري لمدة عام لدراسة مقررات دراسية بحد أقصى 36 ساعة معتمدة كما يجوز زيارة طلاب الكلية لجامعة اخري لدراسة مقررات يتضمنها برنامجهم الدراسي بحد أقصى 36 ساعة معتمدة وتسجل المواد التي درسها في سجله الدراسي بالتقديرات والدرجات والنقاط التي حصل عليها الطالب.

مادة (26): تطبيق أحكام قانون تنظيم الجامعات

1. تطبق هذه اللائحة اعتبارا من العام الجامعي التالي لتاريخ صدورها على الطلاب المستجدين بالمستوى الاول بالكلية، أما الطلاب الباقون للإعادة بالمستوى الاول والطلاب المنقولون للمستويات الاعلى فتنطبق عليهم أحكام اللائحة الداخلية التي التحقوا في ظلها حتى تخرجهم.
2. تطبق أحكام قانون تنظيم الجامعات ولائحته التنفيذية فيما لم يرد فيه نص في هذه اللائحة.
3. يلغى الالتحاق بالبرامج الاخرى الموجودة باللائحة السابقة للكلية والتي لا تضمها هذه اللائحة وذلك اعتبارا من تاريخ قرار صدورها.

مادة (27): تطبيق المعدلات المرجعية للجودة والاعتماد

تلتزم الكلية بضرورة توافق المضمون العلمي لبرامجها مع معايير الجودة في التعليم الجامعي كما حددتها الهيئة القومية لضمان جودة التعليم والاعتماد، وخاصة عدد أعضاء هيئة التدريس على رأس العمل بالكلية أو بالجامعة وملائمة التخصص العلمي لهم معا التدريس للمقررات التي سوف يشاركون

في تدريسها بناء على المقررات الدراسية المرفقة بلائحة الدراسة ومحتواها العلمي، وكذلك توفر الامكانيات المعملية الكافية لاكتساب الطلاب المهارات والمعارف المستهدفة لحصولهم على درجة البكالوريوس في العلوم.

مادة (28): توصيف البرامج والمقررات

يقوم كل قسم من أقسام الكلية بإعداد توصيف كامل لمحتويات البرنامج والمقررات التي يقوم بتدريسها في ضوء مقترحات البرامج والمقررات التي وضعتها لجان علمية متخصصة لنماذج توصيف المقررات الصادرة من هيئة ضمان الجودة والاعتماد و التي أقرتها لجنة قطاع العلوم الاساسية ووافق عليها المجلس الاعلى للجامعات، وبعد اعتمادها من لجنة القطاع تصبح محتويات المقررات ملزمة لأعضاء هيئة التدريس القائمين على التدريس بما لا يقل عن نسبة 80% من المحتوى الدراسي للمقررات، ويجوز لمجلس الكلية بناء على اقتراح مجالسا الاقسام المختصة، تعديل المحتوى العلمي لأي مقرر من المقررات الدراسية بعد أخذ رأى لجنة قطاع العلوم الاساسية .

مادة (29): إنشاء مجلس استشاري للبرامج

يلتزم كل برنامج بإنشاء مجلس استشاري يضم أعضاء من رجال من الصناعة وقطاع الاعمال ويكون لهم دور أساسي في تصميم المناهج وتطويرها ويمكن الاستعانة بهم بالمشاركة في تدريس بعض المقررات التي لها طبيعة تطبيقية أو صناعية. ويمكن لهذا المجلس أن يجتمع أربع مرات على (الاقل) في السنة.

مادة (30): التعليم الهجين

لمجلس الكلية بعد أخذ رأي مجلس القسم المختص وحسب طبيعة المقررات الدراسية أن:

1- يقرر تدريس مقرر أو أكثر بنمط التعليم الهجين بحيث يتم تحديد نسبة التدريس في المقرر وجهاً لوجه بنسبة 70 % وبنظام التعليم عن بعد بنسبة 30 % حسب ظروف الأقسام وعدد الطلاب .

2- لمجلس الكلية بعد أخذ رأي مجلس القسم المختص وحسب طبيعة المقررات الدراسية أن يقرر الامتحان إلكترونياً، أو بأي وسيلة يقترحها مجلس الكلية ويقررها مجلس الجامعة أو المجلس الأعلى للجامعات بما يتناسب مع ظروف تطبيق نظام التعليم الهجين أو بتقديم ورقة بحثية في مقرر أو أكثر. كما يجوز عقد الامتحان في كل المقرر أو جزء منه بما يسمح بتصحيحه إلكترونياً أو تغيير زمن الامتحان بما يتوافق مع طبيعته.

مادة (31): الرموز الواردة باللائحة ومدلولاتها

تستخدم هذه اللائحة مجموعة الرموز ذات دلالات محددة تشير الي متطلبات الجامعة والكلية والأقسام وغيرها وبيان ذلك في الجدول التالي :

جدول (7): الرموز الواردة باللائحة ومدلولاتها.

الرمز	دلالته	الرمز اللاتيني
(م ج)	متطلبات الجامعة	Uni
(ريض)	الرياضيات	Mat
(حسب) (احص)	علوم الحاسب احصاء	Com Sta
(فيز)	الفيزياء	Phy
(افز)	الالكترونيات	Eph
(رفز)	الطاقة المتجددة	Rph
(فيح)	الفيزياء الحيوية	Biop
(كيم)	الكيمياء	Chm
(ط كيم)	الكيمياء التطبيقية الصناعية	AppChm
(كمح)	الكيمياء الحيوية	Bch
(نبت)	النبات	Bot
(ميك)	ميكروبيولوجي	Mic
(ميك كيم)	ميكروبيولوجي وكيمياء	MicChm
(نبت كيم)	نبات وكيمياء	BotChm
(حين)	علم الحيوان	Zoo
(حشر)	حشرات	Ent
(حين كيم)	علم الحيوان وكيمياء	(ZooChm)
(حشر كيم)	حشرات وكيمياء	EntChm
(جيو)	الجيولوجيا	Geo
(جفز)	جيوفيزياء	Gph
(جيو كيم)	جيولوجيا وكيمياء	GeoChm
(ثمب)	جيولوجيا الثروات المعدنية والبترول	Mrp
(جيوه)	الجيولوجيا الهندسية والبيئية	Gen
(بيوتك)	التكنولوجيا الحيوية الجزيئية	Btc

مادة (32): اللائحة المالية

يكون للبرنامج لائحة مالية تحددها اللجنة التنفيذية للبرنامج وتوافق عليها اللجنة العليا ويعتمدها مجلس الجامعة.

تتكون اللجنة التنفيذية من عميد الكلية وكيل الكلية لشـــئون التعليم والطلاب ورئيس القســـم - منســـق البرنامج.

مادة (33): سريان اللائحة

تسري أحكام هذه اللائحة اعتبارا من بداية العام الجامعي التالي لإقرارها بقرار وزاري من وزير التعليم العالي وتطبق فور سريانها على الطلاب المستجدين بالمستوى الاول بالكلية.

البرامج الدراسيه

أولا: قسم الرياضيات

1-البرنامج الدراسي لبرنامج

الذكاء الاصطناعى وعلوم البيانات

(برنامج منفرد بمصروفات)

برنامج العلوم فى الذكاء الاصطناعى وعلوم البيانات

First Level- Courses of Artificial Intelligence and Data Science program

Semester	Course code	Course name	Prerequisites	Hours				Grades					
				Theoretical	Practical	Exercises	Credit Hours	Midterm	Ongoing evaluation	Oral exam	Practical exam	Final exam	Total
Compulsory Courses (11 Credit Hours)													
First	Mat 103	Pure Mathematics (I)	-	2	-	1	2	20	20	10	-	50	100
	Mat 105	Applied Mathematics (I)	-	2	-	1	2	20	20	10	-	50	100
	Chm101	General chemistry (I)	-	2	2	-	3	10	20	10	20	40	100
	Bot 101	General Botany	-	1	2	-	2	10	20	10	20	40	100
	Phy 101	General Physics (I)		1	2	-	2	10	20	10	20	40	100
	Com 101	Computer Fundamentals (I)	-	1	2	-	2	10	20	10	20	40	100
	Uni 107	Societal issues	-	2	-	-	2	25	متطلب جامعه ماده رسوب او نجاح فقط			25	50
	Uni 109	Information technology	-	2	-	-	2	20	20	10	-	50	100
Total							15						700
Second	Mat102	Pure Mathematics (II)	-	2	-	2	3	20	20	10	-	50	100
	Mat104	Applied Mathematics (II)	-	2	-	2	3	20	20	10	-	50	100
	Chm 102	General Chemistry (II)	-	2	2	-	3	10	20	10	20	40	100
	Phy102	General Physics (II)	-	2	2	-	3	10	20	10	20	40	100
	Zoo 101	General Zoology	-	2	-	2	3	10	20	10	20	40	100
	Com 102	Computer Fundamentals (II)	-	1	2	-	2	10	20	10	20	40	100
	Uni 108	English for Science	-	2	-	-	2	20	20	10	-	50	100
Total							19						700
Total for both semesters							34						1400

برنامج العلوم فى الذكاء الاصطناعى وعلوم البيانات

Second level -Artificial Intelligence and Data Science Program

Semester	Course code	Course name	Prerequisites	Hours				Grades					
				Theoretical	Practical	Exercises	Credit Hours	Midterm	Ongoing evaluation	Oral exam	Practical exam	Final exam	Total
Compulsory Courses (13 Credit Hours)													
First	Mat 213	Linear Algebra and Geometry	Mat103	2	-	1	2	20	20	10	-	50	100
	Com 261	Programming Language	Com101	2	2	-	3	10	20	10	20	40	100
	Com 263	Guided Programming		2	2	-	3	10	20	10	20	40	100
	Mat 215	Mathematical Analysis (I)	-	2	-	1	2	20	20	10	-	50	100
	Mat 205	Discrete Mathematics		2	-	2	3	20	20	10	-	50	100
	Optional Courses(students should choose 4 credit Hours including 2 hrs. of university requirements)												
	Mat 207	Vector Analysis	Mat102	2	-	-	2	20	20	10	-	50	100
	Com 271	Neural Networks		2	-	1	2	10	20	10	20	40	100
	Uni 209	University requirement		2	-	-	2	20	20	10	-	50	100
Total							17						700
	Compulsory Courses (13 Credit Hours)												
Second	Com 250	Operation Research	-	2	-	1	2	10	20	10	20	40	100
	Mat 208	Mathematical Analysis (II)		2	-	2	3	20	20	10	-	50	100
	Mat 232	Statistics and Probabilities		2	-	2	3	20	20	10	-	50	100
	Mat 210	Ordinary Differential Equations		2	-	2	3	20	20	10	-	50	100
	Com 280	Internet Technology	-	2	-	1	2	10	20	10	20	40	100
	Optional Courses(students should choose 4 credit Hours including 2 hrs. of university requirements)												
	Mat 218	Statistical inference		2	-	-	2	20	20	10	-	50	100
	Com 274	Simulation and Modeling	-	2	-	1	2	20	10	10	20	40	100
	Uni 210	University requirement		2	-	-	2	20	20	10	-	50	100
Total							17						700
Total for both semesters							34						1400

برنامج العلوم فى الذكاء الاصطناعى وعلوم البيانات

Third level-Courses of Artificial Intelligence and Data Science program

Semester	Course code	Course name	Prerequisites	Hours				Grades					
				Theoretical	Practical	Exercises	Credit Hours	Midterm	Ongoing evaluation	Oral exam	Practical exam	Final exam	Total
Compulsory Courses (14 Credit Hours)													
First	Com 373	Distributed Systems	Com 250	2	-	2	3	10	20	10	20	40	100
	Com 386	Artificial Intelligence	--	2	-	1	2	10	20	10	20	40	100
	Com 387	Data Science	-	2	-	2	3	10	20	10	20	40	100
	Mat 315	Numerical Analysis and computing	Mat 213	2	-	2	3	20	20	10	-	50	100
	Com 388	Machine learning	--	2	2	-	3	10	20	10	20	40	100
	Optional Courses (3 Credit Hours)												
	Mat 313	Numerical Analysis (1)		2	2	-	3	20	20	10	-	50	100
	Com 367	Database Design		2	-	2	3	10	20	10	20	40	100
	Com 379	Queue Theory	Com 261	2	-	2	3	10	20	10	20	40	100
Total							17						600
	Compulsory Courses (13 Credit Hours)												
Second	Com 362	Computer Systems	Com 373	2	-	2	3	10	20	10	20	40	100
	Com 389	Intelligent Agents	Com 386	2	-	1	2	10	20	10	20	40	100
	Com 368	Data Mining		2	-	2	3	10	20	10	20	40	100
	Com 390	Big Data analytics		2	-	2	3	10	20	10	20	40	100
	Com 370	Operating Systems	Com 329	2	-	1	2	10	20	10	20	40	100
	Optional Courses (3 Credit Hours)												
	Com 364	Data structures	Com 377	2	-	2	3	10	20	10	20	40	100
	Mat302	Mathematical Logic		2	2	-	3	20	20	10	-	50	100
Total							17						600
Total for both semesters							34						1200

برنامج العلوم فى الذكاء الاصطناعى وعلوم البيانات

Fourth level - Courses of Artificial Intelligence and Data Science program

Semester	Course code	Course name	Prerequisites	Hours				Grades					
				Theoretical	Practical	Exercises	Credit Hours	Midterm	Ongoing evaluation	Oral exam	Practical exam	Final exam	Total
Compulsory Courses (14 Credit Hours)													
First	Com 461	Computer Networks	Com 362	2	-	1	2	10	20	10	20	40	100
	Com 493	Computer Vision	--	2	-	1	2	10	20	10	20	40	100
	Com 494	Data Analytics Programming	--	2	-	1	2	10	20	10	20	40	100
	Mat 411	Quantum Mechanics (1)	-	2	-	1	2	20	20	10	-	50	100
	Com 495	Natural Language Processing	-	2	-	2	3	10	20	10	20	40	100
	Com 417	Field Training		3	40% Report - 40% Supervision-20% Discussion								100
	Com 490	Scientific Research Course	-		Continuous								
	Optional Courses (3 Credit Hours)												
	Com 485	Elective Course (1)	-	2	-	2	3	10	20	10	20	40	100
	Com 471	Automation and formal languages	-	2	-	2	3	10	20	10	20	40	100
Total							18						700
	Compulsory Courses (12 Credit Hours)												
Second	Com 496	Web & Social Media Analytics	--	2	-	1	2	10	20	10	20	40	100
	Mat 420	Mathematical Modeling	-	2	-	1	2	10	20	10	20	40	100
	Com 497	Robotics		2	-	1	2	10	20	10	20	40	100
	Com 498	Neural network and deep learning	Com 386	2	-	2	3	10	20	10	20	40	100
	Com 490	Scientific Research Course	-	3	20% Report-20% Supervision- 60% Discussion								100
	Optional Courses (3 Credit Hours)												
	Com 486	Elective Course (2)	-	2	-	2	3	10	20	10	20	40	100
	Com 462	Design Web Pages	Com 373	2	-	2	3	10	20	10	20	40	100
Total							17						600
Total for both semesters							35						1300

قسم الرياضيات

المحتوى الدراسي لبرنامج

بكلوريوس العلوم فى

الذكاء الاصطناعى وعلوم البيانات

(برنامج منفرد بمصروفات)

المواصفات الأساسية لمقررات الفرقة الاولى الترم الاول

Compulsory Courses (17 Credit Hours)

Mat 103	Pure Mathematics (I)		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	0	
Required SWL	100	Equivalent ECTS	3
Course Content			
Functions and Models. Limits and Derivatives. Differentiation Rules. Applications of Differentiation			

Taught in Program(s)					
As major in Program(s) Code(s)					
Math, Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		20%		10%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Mat105	Applied Mathematics (I)		3 CH
Prerequisites	Mat105		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	0	
Required SWL	100	Equivalent ECTS	4
Course Content			
Statics: vector algebra - forces - moments - couplings - equilibrium of forces - center of gravity.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and

		Infrastructure			Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		20%		10%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Chm 101	General chemistry (I)		3 CH
Prerequisites	Chm101		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	0	
Required SWL	100	Equivalent ECTS	4

Course Content

Matter, atomic structure and the periodic table, chemical bonding, Lewis structure of metal - compounds, Molecular geometry, VSEPR, molecular orbital theory, Fullerenes, Carbon nanotubes, carbon Nano balls. An introduction to qualitative analyses.

Practical: -

1-Simple salts (detection of acidic and basic radicals).

2-Mixtures (detection of basic radicals).

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science and Artificial Intelligence and Data Science
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		10%		30%		40%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Bot101	General Botany	3 CH

Prerequisites	Bot101		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	0	
Required SWL	100	Equivalent ECTS	4

Course Content

Plant Kingdom: Plant Classification System, Viruses, Bacteria, Cyanobacteria, Algae, Fungi, Lichen, Embryophytes, Bryophyta, Pteridophyte, Gymnosperms, Angiosperm, General Characteristics and Life Cycle of Each Group.
Plant Morphology: Introduction to plant morphology, Seeds (definition, structure, function), Seed germination, types of germination, Root morphology (General Characters, functions of root, regions of root), Types of roots, modification of roots, Stem morphology (General Characters, functions), Buds, Types of buds according to (location, status, morphology, function), Type of Stems, Plant branching, Underground Stems, Modifications, Leaf morphology (parts of the leaf, stipules, petioles, leaf arrangement on a stem, simple and compound leaves, venation, lamina (blade) shape, leaf margin, leaf apex, leaf base), Special types of leaves (Leaf modifications).

Taught in Program(s)

As major in Program(s) Code(s)

Math, Computer Science and Artificial Intelligence and Data Science

As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		10%		30%		40%	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Phy101	General Physics (I)		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	0	
Required SWL	100	Equivalent ECTS	4

Course Content

Coulomb's Law; The Electric Field; Electric Flux; Gauss's Law; Application Of Gauss's Law; Electric Potential and Potential Difference; Applications of Electrostatics; Capacitors; Combinations of Capacitors; Capacitance and Dielectrics; Electric Current; Ohm' Law; Electrical Power; Electromotive Force; Combinations of Resistors; Kirchhoff's Rules & Direct-Current Circuits' Analysis; Magnetic Fields and Forces; Applications Involving Charged Particles Moving in Magnetic Field; The Biot–Savart Law; Ampère's Law; Gauss's Law in Magnetism; Faraday's Law of Induction; Lenz's Law; Energy in Magnetic Field; Light under reflection (Specular reflection, Diffuse reflection, Law of reflection); Light Under Refraction (Index of Refraction, Snell's law of refraction, Light passing through a glass slab, Light passing through a glass prism); Huygens's Principle; Images Formed by: 1) Flat Mirrors, 2) Spherical Mirrors (Concave mirror, Convex mirrors, Parabolic mirrors), 3) Refraction at a spherical surface and 4) Thin Lenses.

Taught in Program(s)											
As major in Program(s) Code(s)											
Computer Science and Artificial Intelligence and Data Science											
As minor in Program(s) Code(s)											
Targeted Sustainable Development Goals											
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger		☒ GOAL 3: Good Health and Well-being		☒ GOAL 4: Quality Education		☒ GOAL 5: Gender Equality		☐ GOAL 6: Clean Water and Sanitation		
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth		☒ GOAL 9: Industry, Innovation and Infrastructure		☐ GOAL 10: Reduced Inequality		☒ GOAL 11: Sustainable Cities and Communities		☒ GOAL 12: Responsible Consumption and Production		
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water		☒ GOAL 15: Life on Land		☐ GOAL 16: Peace and Justice Strong Institutions		☐ GOAL 17: Partnerships to achieve the Goal				
Assessment Weights											
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)				
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam			
0%	20%		10%		30%		40%				
Student Activities Breakdown (Distribution for Study Blocks)											
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)						
0%	0%		0%		0%						

Optional Courses (students should choose 4 credit Hours including 2 hrs. of university requirements)

Com101	Computer Fundamentals (I)		3 CH
Prerequisites	Com101		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	0	0	
Required SWL	100	Equivalent ECTS	4
Course Content			
Numerical systems, Algorithms, Flow Maps, Variables and Sentences Control Structures: Conditional Statements, Arrays, Pointers, Scripts and Structures.			

Taught in Program(s)											
As major in Program(s) Code(s)											
Computer Science and Artificial Intelligence and Data Science											
As minor in Program(s) Code(s)											
Targeted Sustainable Development Goals											
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger		☒ GOAL 3: Good Health and Well-being		☒ GOAL 4: Quality Education		☒ GOAL 5: Gender Equality		☐ GOAL 6: Clean Water and Sanitation		
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth		☒ GOAL 9: Industry, Innovation and Infrastructure		☐ GOAL 10: Reduced Inequality		☒ GOAL 11: Sustainable Cities and Communities		☒ GOAL 12: Responsible Consumption and Production		
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water		☒ GOAL 15: Life on Land		☐ GOAL 16: Peace and Justice Strong Institutions		☐ GOAL 17: Partnerships to achieve the Goal				
Assessment Weights											
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)				
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam			

0%	20%	10%	30%	40%
Student Activities Breakdown (Distribution for Study Blocks)				
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)	
0%	0%	0%	0%	

Uni 107	Societal issues	2 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	0	0
Required SWL	50	Equivalent ECTS 2
Course Content		

المحتوى: يتكون هذا المقرر من بابين الأول اجباري ويحتوي على اربعه فصول كلاتي:

الفصل الأول: المشكلات المترتبه على الزياده السكانية واثرها على الصحه الإنجابية.

الفصل الثاني : حقوق الانسان

الفصل الثالث: الشفافيه ومكافحة الفساد.

الفصل الرابع: سماحة الأديان واداب الحوار مع الاخر.

والباب الثاني اختياري ويتكون من فصلين:

الفصل الخامس: التربيه الاعلاميه الرقمية

الفصل السادس: يحدده مجلس الكلية.

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
0%	50%		0		0		50%	
Student Activities Breakdown (Distribution for Study Blocks)								
Seminar-based (SB)	Self-learning-based (SL)				Project-based (PB)		Industry-based (IB)	
0%	0%				0%		0%	

Uni 109	Information technology	2 CH

Prerequisites			
Number of weekly Contact Hours			
Lecture		Tutorial	Laboratory
2		0	0
Required SWL	100	Equivalent ECTS	2
Course Content			
The syllabus consists of five major modules: 1- Information Systems: To give students a broad foundation of basic computing/data is processing knowledge and skills. 2: Human communication and Business Organization: To provide students with the necessary written and verbal communication skills to enable them to relate to others on computing and non-computing matters- To give the student an understanding of the information needs of organizations, the various types of organization and the various ways that Information-Technology permeates within organizations. 3: Software: To become familiar with the various types of software categories and their capabilities- Students will develop skills to use generic software especially of database and spreadsheet nature. 4: Programming Techniques and System Development: To give students knowledge of the necessary techniques needed to implement algorithmic design using a high-level language, which is object oriented (Java), as well as creating, testing and maintaining the implemented systems. (A working knowledge of a high levelprogramming language at SEC level is recommended.) 5: Exercises: To give students the opportunity to put into practice concepts learnt during the course.			

Taught in Program(s)											
As major in Program(s) Code(s)											
All programs in second level											
As minor in Program(s) Code(s)											
Targeted Sustainable Development Goals											
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger		☒ GOAL 3: Good Health and Well-being		☒ GOAL 4: Quality Education		☒ GOAL 5: Gender Equality		☐ GOAL 6: Clean Water and Sanitation		
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth		☒ GOAL 9: Industry, Innovation and Infrastructure		☐ GOAL 10: Reduced Inequality		☒ GOAL 11: Sustainable Cities and Communities		☒ GOAL 12: Responsible Consumption and Production		
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water		☒ GOAL 15: Life on Land		☐ GOAL 16: Peace and Justice Strong Institutions		☐ GOAL 17: Partnerships to achieve the Goal				
Assessment Weights											
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)				
	☐ Assessment	☒ Exam	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam			
0%	20%		20%		10%		50%				
Student Activities Breakdown (Distribution for Study Blocks)											
Seminar-based (SB)		Self-learning-based (SL)			Project-based (PB)			Industry-based (IB)			
0%		0%			0%			0%			

المواصفات الأساسية لمقررات المستوي الاول الترم الثاني

Compulsory Courses (18 Credit Hours)

Mat 102	Pure Mathematics (II)		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial		Laboratory
2	2		0
Required SWL	100	Equivalent ECTS	2
Course Content			
Definite and indefinite integrals, techniques of integration, improper integrals, infinite series, applications.			

Taught in Program(s)
As major in Program(s) Code(s)

Math, Computer Science and Artificial Intelligence and Data Science											
As minor in Program(s) Code(s)											
Targeted Sustainable Development Goals											
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger		☒ GOAL 3: Good Health and Well-being		☒ GOAL 4: Quality Education		☒ GOAL 5: Gender Equality		☐ GOAL 6: Clean Water and Sanitation		
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth		☒ GOAL 9: Industry, Innovation and Infrastructure		☐ GOAL 10: Reduced Inequality		☒ GOAL 11: Sustainable Cities and Communities		☒ GOAL 12: Responsible Consumption and Production		
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water		☒ GOAL 15: Life on Land		☐ GOAL 16: Peace and Justice Strong Institutions		☐ GOAL 17: Partnerships to achieve the Goal				
Assessment Weights											
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)				
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam			
0%	20%		20%		10%		50%				
Student Activities Breakdown (Distribution for Study Blocks)											
Seminar-based (SB)			Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)				
0%			0%		0%		0%				

Mat104	Applied Mathematics (II)		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	0	
Required SWL	100	Equivalent ECTS	2
Course Content			
Statics: Dynamics: movement of a material point in a straight line - projectiles - simple harmonic motion - impulse and collision.			

Taught in Program(s)											
As major in Program(s) Code(s)											
Computer Science and Artificial Intelligence and Data Science											
As minor in Program(s) Code(s)											
Targeted Sustainable Development Goals											
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger		☒ GOAL 3: Good Health and Well-being		☒ GOAL 4: Quality Education		☒ GOAL 5: Gender Equality		☐ GOAL 6: Clean Water and Sanitation		
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth		☒ GOAL 9: Industry, Innovation and Infrastructure		☐ GOAL 10: Reduced Inequality		☒ GOAL 11: Sustainable Cities and Communities		☒ GOAL 12: Responsible Consumption and Production		
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water		☒ GOAL 15: Life on Land		☐ GOAL 16: Peace and Justice Strong Institutions		☐ GOAL 17: Partnerships to achieve the Goal				
Assessment Weights											
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)				
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam			
0%	20%		20%		10%		50%				
Student Activities Breakdown (Distribution for Study Blocks)											
Seminar-based (SB)			Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)				
0%			0%		0%		0%				

Chm 102	General chemistry (II)		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	100	Equivalent ECTS	2
Course Content			
States of matter - chemical equilibria - ionic equilibriums - introduction to volumetric analysis - chemistry of solutions - introduction to the chemistry of surfaces and crystals – phase rule - electrolyte solutions and electrical conductivity - electrochemical cells and electrode potential – nuclear reactions. Practical: - Determination of the viscosity of liquids - determination of density - determination of heat of dissolution - determination of the equilibrium constant - determination of pH - determination of the solubility yield - study of the common ion action (Le Chatelier's principle) - determination of the molecular weight of a compound - study of the miscibility of phenol with water - determination of the distribution coefficient.			

Taught in Program(s)						
As major in Program(s) Code(s)						
Computer Science and Artificial Intelligence and Data Science						
As minor in Program(s) Code(s)						
Targeted Sustainable Development Goals						
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation	
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production	
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal		

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	10%		20%		30%		40%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Phy102	General Physics (II)		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	100	Equivalent ECTS	2
Course Content			
Fluid dynamics; Temperature and the Zeroth Law of Thermodynamics; Thermometers & Temperature Scales; Thermal Expansion of Solids; Macroscopic Description of an Ideal Gas; Heat and Internal Energy; Specific Heat and Calorimetry; Latent Heat; The Kinetic Theory of Gases; Energy Transfer Mechanisms in Thermal Processes; Work and Heat in Thermodynamic Processes; The First Law of Thermodynamics; Sound Waves; Pressure Variations in Sound Waves; Speed of Sound Waves; Sound Level in Decibels; The Doppler Effect			

Taught in Program(s)					
As major in Program(s) Code(s)					
Math, Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	10%		20%		30%		40%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Zoo 101	General Zoology		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	0	
Required SWL	100	Equivalent ECTS	2

Course Content

Cytology and Histology:

Cell components and ultra-structure of the animal cell- cell division (mitosis and meiosis)- epithelial tissues- connective tissues- muscular tissues- nervous tissues.

Physiology:

General knowledge of some body systems from the anatomical point of view:

- Structure of skeletal system, bone connection and physiological factors affecting bone growth
- Digestive system, mechanism of digestion, factors affecting enzymes and hormones secretion for digestion
- Structure of circulatory system, Blood synthesis, and Physiological factor affecting blood components
- Structure and function of neuromuscular system
- Structure and function of urinogenital system - Mechanism of urine formation.

Introduction of Embryology:

- Study of basic concepts of embryology, including gametogenesis; fertilization; pattern of cleavage and embryonic membranes of vertebrate species.

-Embryonic development of vertebrates (amphioxus, tadpole, chick & mammal) including muscles, coelom, heart, eyes, nervous system , skeleton, olfactory and auditory organs. Embryonic membranes &placenta.

Taught in Program(s)	
As major in Program(s) Code(s)	
Computer Science and Artificial Intelligence and Data Science	
As minor in Program(s) Code(s)	
Targeted Sustainable Development Goals	

☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	10%		20%		30%		40%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Com 102	Computer Fundamentals (II)		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
1	0	2	
Required SWL	100	Equivalent ECTS	1.5
Course Content			
Software types: Operating system - Applied software - Programming languages.			

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science and Artificial Intelligence and Data Science
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	10%		20%		30%		40%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Uni 108	English for Science		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	0	0	
Required SWL	100	Equivalent ECTS	1
Course Content			
Coverage of selected scientific terminology, with the objective of familiarizing the students with the English terms and their Arabic counter parts, focusing on the spelling and pronunciation of these terms. Coverage of some areas in traditional English grammar, particularly those problematic for the students at this stage..			

Taught in Program(s)					
As major in Program(s) Code(s)					
All programs in second level					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		20%		10%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Mat 213	Linear Algebra and Geometry		2 CH
Prerequisites	Mat 103		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	0	
Required SWL	-	Equivalent ECTS	-
Course Content			
Systems of linear equations and matrices determinants. Vectors in binary space and linear space. Linear conversions. Eigenvalues and eigenvectors.Apps.Conic section engineering. Numerical methods in linear algebra			
Taught in Program(s)			
As major in Program(s) Code(s)			
Artificial Intelligence and Data Science			
As minor in Program(s) Code(s)			
Artificial Intelligence and Data Science			
Targeted Sustainable Development Goals			

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and	☐ GOAL 8: Decent Work	☒ GOAL 9: Industry,	☐ GOAL 10: Reduced	☒ GOAL 11: Sustainable	☒ GOAL 12: Responsible

Clean Energy	and Economic Growth	Innovation and Infrastructure	Inequality	Cities and Communities	Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
20%	20%		10%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	10%	10%	10%

المواصفات الأساسية لمقررات الفرقة الثانية الترم الثانى

Compulsory Courses (13 Credit Hours)

Com250	Operation Research	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	1	0

Required SWL	100	Equivalent ECTS	3

Course Content

Aims and scope of Operations research and its applications. Formulation of real-world problems as linear programs. Graphical solution of linear programs. Graphical Sensitivity Analysis. Study of special LP Models: Transportation and Assignment Problems. Decision Theory. Introduction to Optimization in one variable. Introduction to Queuing Theory

Taught in Program(s)
As major in Program(s) Code(s)
Math, Computer Science and Artificial Intelligence and Data Science
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		10%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Mat208	Mathematical Analysis (II)	3 CH
Prerequisites	Mat215	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory

2	2	0

Required SWL	100	Equivalent ECTS	4

Course Content

Improper integrals, convergence and absolute convergence, tests for absolute convergence and conditions for improper integrals, beta and gamma functions and their applications, number sequences, convergence and the Cauchy condition, endpoints and partial sequences, Bolzano and Verstrass theorem, connection relationship with sequences, regular connection, number series and convergence tests, sequences and series of functions , point convergence and uniform convergence, Weierstrass theorem and power series, the relationship between convergence and calculus operations, Taylor and Maclaurin series, Fourbier series.

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		10%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Mat232	Statistics and Probabilities	3 CH
Prerequisites	Mat103	

Number of weekly Contact Hours

Lecture	Tutorial	Laboratory
2	2	0

Required SWL	100	Equivalent ECTS	4

Course Content

Statistical Methods - Measures of Central Tendency - definition of sample space - event - random experiment - definition of probability - probability calculation laws - conditional probability and independence - Bayes' theory.

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and	☐ GOAL 8: Decent Work	☒ GOAL 9: Industry,	☐ GOAL 10: Reduced	☒ GOAL 11: Sustainable	☒ GOAL 12: Responsible

Clean Energy	and Economic Growth	Innovation and Infrastructure	Inequality	Cities and Communities	Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		10%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Mat210	Ordinary Differential Equations	3 CH

Prerequisites	Mat106		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	0	
Required SWL	100	Equivalent ECTS	4

Course Content

Introduction to ordinary differential equations (ODEs), methods for solving first-order ODEs, homogeneous nth-order differential equations with constant coefficients and their solutions, non-homogeneous nth-order differential equations with constant coefficients and their solutions, ODEs with variable coefficients, analytical and numerical methods for solving ODEs.

Taught in Program(s)

As major in Program(s) Code(s)

Math, Computer Science and Artificial Intelligence and Data Science

As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		10%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Com280	Internet Technology	2 CH

Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	0	
Required SWL	100	Equivalent ECTS	3
Course Content			
Networking Basics, Internet TCP/IP, Internet Domains, Addresses, Internet Infrastructure, Internet Protocols, Internet Hardware Components, Internet Access, Internet and Extranet.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		10%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Optional Courses(students should choose 4 credit Hours including 2 hrs. of university requirements)

Mat218	Statistical inference	2 CH
Prerequisites	Mat106	
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	0	0
Required SWL	100	Equivalent ECTS	2
Course Content		
Definition of: population, sample, statistic, estimator, sample types, characteristics of a good estimator (impartiality, sufficiency, efficiency, consistency). Some estimation methods: point estimation, period estimation, Bayes method and minimax method. Approximate properties of abilities.		

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science and Artificial Intelligence and Data Science
As minor in Program(s) Code(s)
Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		10%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Com274	Simulation and Modeling		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	0	0	
Required SWL	100	Equivalent ECTS	2
Course Content			
Introduction to simulation. Manual simulation. Review the basics of probability theory. Generate random numbers, random variables. Output analysis. Queue prototypes, practical examples.			

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science and Artificial Intelligence and Data Science
As minor in Program(s) Code(s)
Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		10%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Uni210	University requirement	2 CH
Prerequisites		
Number of weekly Contact Hours		

Lecture	Tutorial	Laboratory
2	0	0

Required SWL	100	Equivalent ECTS	2

Course Content

This course deals with the study of leadership behaviour and its importance in building the personality in the institutions and society and knowing the relationship between the leadership and innovation. It also includes a detailed discussion of the personal characteristics of innovators, factors of innovation success and developing the administratixxve processes, knowing the criteria for building and developing the innovative behavior and practical cases and applications in leadership and management of innovation

Taught in Program(s)					
As major in Program(s) Code(s)					
All programs in second level					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		20%		10%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

المواصفات الأساسية لمقررات الفرقة الثالثة الترم الثاني

Compulsory Courses (13 Credit Hours)

Com 362	Computer Systems	3 CH
Prerequisites	Com 373	

Number of weekly Contact Hours

Lecture	Tutorial	Laboratory
2	2	0

Required SWL	100	Equivalent ECTS	4

Course Content

Components of a computer, Arithmetic systems and relationships between
them, Code, Logic gates and logic circuits, memory, recorders, processor, data movement within the device.

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and	☐ GOAL 8: Decent Work	☒ GOAL 9: Industry,	☐ GOAL 10: Reduced	☒ GOAL 11: Sustainable	☒ GOAL 12: Responsible

Clean Energy	and Economic Growth	Innovation and Infrastructure	Inequality	Cities and Communities	Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	10%		20%		30%		40%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Com 389	Intelligent Agents	2 CH
Prerequisites	Com 386	

Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	0	
Required SWL	100	Equivalent ECTS	3

Course Content

This course gives a broad introduction to the new and rapidly expanding field of agent-based computing. It introduces the key concepts and models of the field, dealing both with the individual agents and with their interactions. Particular emphasis is placed on automated negotiation, cooperation and on-line auctions, and students are required to program a trading agent in Java which will compete in a class tournament within a simulated trading environment.

Taught in Program(s)
As major in Program(s) Code(s)
Computer Science and Artificial Intelligence and Data Science
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	10%		20%		30%		40%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Com 368	Data Mining			3 CH
Prerequisites				
Number of weekly Contact Hours				
Lecture		Tutorial		Laboratory
2		2		0
Required SWL	100	Equivalent ECTS		4
Course Content				
Discover knowledge in the steps of data mining in databases, data cleaning and preparation, embedded mining rules, classification, prediction, clustering, web mining, data mining applications, advanced database mining.				

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	10%		20%		30%		40%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Com 390	Big Data analytics			3 CH
Prerequisites				
Number of weekly Contact Hours				
Lecture		Tutorial		Laboratory
2		2		0
Required SWL	100	Equivalent ECTS		4
Course Content				
This course provides a comprehensive and rigorous introduction to big data analytics. It will describe the hardware/software infrastructures that are used today for big data (e.g., Hadoop, Hive) and the implications of these infrastructures for the accurate and efficient analysis of big data. Students will learn the mathematical, statistical, artificial intelligence, and modeling techniques that have been developed for analysis of big data, especially for health care applications. Also, it will describe the visualization techniques which are useful for displaying big data analysis results for meaningful interpretation of the results by humans.				
Taught in Program(s)				

As major in Program(s) Code(s)											
Computer Science and Artificial Intelligence and Data Science											
As minor in Program(s) Code(s)											
Targeted Sustainable Development Goals											
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger		☒ GOAL 3: Good Health and Well-being		☒ GOAL 4: Quality Education		☒ GOAL 5: Gender Equality		☐ GOAL 6: Clean Water and Sanitation		
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth		☒ GOAL 9: Industry, Innovation and Infrastructure		☐ GOAL 10: Reduced Inequality		☒ GOAL 11: Sustainable Cities and Communities		☒ GOAL 12: Responsible Consumption and Production		
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water		☒ GOAL 15: Life on Land		☐ GOAL 16: Peace and Justice Strong Institutions		☐ GOAL 17: Partnerships to achieve the Goal				
Assessment Weights											
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)				
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam			
0%	10%		20%		30%		40%				
Student Activities Breakdown (Distribution for Study Blocks)											
Seminar-based (SB)			Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)				
0%			0%		0%		0%				

Com 370	Operating Systems		2 CH
Prerequisites	Com 329		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	0	
Required SWL	100	Equivalent ECTS	3
Course Content			
Study- design and implementation of traditional and distributed operating systems. History of operating systems development.Process concept. System calls and communication between processes. Memory management.Implementation of file systems.Input and output management.Distributed systems.Synchronization. Distributed file systems. Examples of operating systems such as Unix, Windows, OS2.			

Taught in Program(s)											
As major in Program(s) Code(s)											
Computer Science and Artificial Intelligence and Data Science											
As minor in Program(s) Code(s)											
Targeted Sustainable Development Goals											
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger		☒ GOAL 3: Good Health and Well-being		☒ GOAL 4: Quality Education		☒ GOAL 5: Gender Equality		☐ GOAL 6: Clean Water and Sanitation		
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth		☒ GOAL 9: Industry, Innovation and Infrastructure		☐ GOAL 10: Reduced Inequality		☒ GOAL 11: Sustainable Cities and Communities		☒ GOAL 12: Responsible Consumption and Production		
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water		☒ GOAL 15: Life on Land		☐ GOAL 16: Peace and Justice Strong Institutions		☐ GOAL 17: Partnerships to achieve the Goal				
Assessment Weights											
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)				
	☐	☒	☒	☐	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam			

	Assessment	Exam	Assessment	Exam				
0%	10%		20%		30%		40%	
Student Activities Breakdown (Distribution for Study Blocks)								
Seminar-based (SB)		Self-learning-based (SL)			Project-based (PB)		Industry-based (IB)	
0%		0%			0%		0%	

Optional Courses (students should choose 3credit Hours. university requirements)

com364	Data structures		3 CH
Prerequisites	Com 377		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	0	
Required SWL	100	Equivalent ECTS	4
Course Content			
Data types, Stacks, Queues, One-dimensional systems and Two-dimensional systems, Linear lists: ordinal lists, linked lists, circular linked lists, doubly linked lists.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	10%		20%		30%		40%	
Student Activities Breakdown (Distribution for Study Blocks)								
Seminar-based (SB)		Self-learning-based (SL)			Project-based (PB)		Industry-based (IB)	
0%		0%			0%		0%	

Mat302	Mathematical Logic		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	0	2	
Required SWL	100	Equivalent ECTS	4
Course Content			
First-order logic: some properties of first-order theorems, deductive theorem, perfectionist theories, some additional meta-theorems, base C (free test operation), standard Brinks photograph. Formal number theory: a system of axioms, deduction, equality, substitution, addition, multiplication, ordering, formal arithmetic, Gödel's theorem.			

Taught in Program(s)						
As major in Program(s) Code(s)						
Math, Computer Science and Artificial Intelligence and Data Science						
As minor in Program(s) Code(s)						
Targeted Sustainable Development Goals						
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation	
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production	
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal		

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		20%		10%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

المواصفات الأساسية لمقررات الفرقة الرابعة الترم الاول

Compulsory Courses (14 Credit Hours)

Com 461	Computer Networks		2 CH
Prerequisites	Com 461		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	0	
Required SWL	100	Equivalent ECTS	4
Course Content			
Theoretical terms needed to understand networks. Network shapes and types. The range of positives in physical media.digital and optical signals. data linking methods. Error detection and correction. Control posted messages. retort algorithms. International network systems, delivery and transport (UDP), (TCP / IP). Network applications and local networks, wide area networks.			
Taught in Program(s)			
As major in Program(s) Code(s)			
Math, Computer Science and Artificial Intelligence and Data Science			
As minor in Program(s) Code(s)			
Targeted Sustainable Development Goals			

☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam

0%	10%	20%	30%	40%
Student Activities Breakdown (Distribution for Study Blocks)				
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)	
0%	0%	0%	0%	

Com 493	Computer Vision		2 CH
Prerequisites	Com 493		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	0	
Required SWL	100	Equivalent ECTS	4
Course Content			
This course introduces computer vision, including fundamentals of image formation, camera imaging geometry, feature detection and matching, stereo, motion estimation and tracking, image classification, scene understanding, and deep learning with neural networks. We will develop basic methods for applications that include finding known models in images, depth recovery from stereo, camera calibration, image stabilization, automated alignment, tracking, boundary detection, and recognition.			
Taught in Program(s)			
As major in Program(s) Code(s)			
Math, Computer Science and Artificial Intelligence and Data Science			
As minor in Program(s) Code(s)			
Targeted Sustainable Development Goals			

☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	10%		20%		30%		40%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Com 494	Data Analytics Programming		2 CH
Prerequisites	Com 494		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	0	
Required SWL	100	Equivalent ECTS	4
Course Content			
This course is designed to introduce data analytics programming in Python to students. Students will learn programming foundations, application development in Python, and how to integrate Python applications with business operations in this class. This course consists of the following learning objectives: Students will learn Python programming fundamentals. Knowledge such as object-oriented programming in Python will be introduced to students. Students will learn how to use Python to perform business data analysis. Techniques such as time series analysis, geographical data analysis in Python will be introduced to students.			
Taught in Program(s)			

As major in Program(s) Code(s)					
Math, Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	10%		20%		30%		40%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Mat 411 Quantum Mechanics (1) 2 CH

Prerequisites	Mat 411		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	0	
Required SWL	100	Equivalent ECTS	4

Course Content

Dilemmas of classical physics - Photon polarization - Postulates of quantum mechanics - Schrodinger's equation and wave functions - Operators, eigenfunctions, and eigenvalues - One-dimensional potentials - Harmonic oscillator - General structure of wave mechanics - Time dependence of operators (Heisenberg picture) - Operator methods - Harmonic oscillator - Schrodinger Equation in three dimensions - Hilbert space and matrix mechanics - Angular momentum.

Taught in Program(s)					
As major in Program(s) Code(s)					
Math, Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		20%		10%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Com 495	Natural Language Processing		3 CH
Prerequisites	Com 495		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	0	
Required SWL	100	Equivalent ECTS	4
Course Content			
Foundations of the natural language processing, language data in corpora, levels of description: phonetics and phonology, morphology, syntax, semantics and pragmatics. Traditional vs. formal grammars: representation of morphological and syntactic structures, meaning representation. context-free grammars and their context-sensitive extensions, DCG (Definite Clause Grammars), CKY algorithm (Cocke-Kasami-Younger), chart-parsing. Problem of ambiguity. Electronic dictionaries: representation of lexical knowledge. Types of the machine-readable dictionaries. Semantic representation of sentence meaning. The Compositionality Principle, composition of meaning. Semantic classification: valence frames, predicates, ontologies, transparent intentional logic (TIL) and its application to semantic analysis of sentences. Pragmatics: semantic and pragmatic nature of noun groups, discourse structure, deictic expressions, verbal and non-verbal contexts. Natural language understanding: semantic representation, inference and knowledge representations.			
Taught in Program(s)			
As major in Program(s) Code(s)			
Math, Computer Science and Artificial Intelligence and Data Science			
As minor in Program(s) Code(s)			
Targeted Sustainable Development Goals			

☒ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	10%		20%		30%		40%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Com 417	Field Training		3 CH
Prerequisites	Com 417		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
3	0	0	
Required SWL	100	Equivalent ECTS	4
Course Content			
Training in the field of computer science.			
Taught in Program(s)			
As major in Program(s) Code(s)			
Math, Computer Science and Artificial Intelligence and Data Science			
As minor in Program(s) Code(s)			

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights			
Student Activities (SA)	Report	Supervision	Discussion
0%	40%	40%	20%

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Com 490	Project	3 CH
Prerequisites	Com 490	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
along two semesters		0

Required SWL	Continuous	Equivalent ECTS	4

Course Content

The project of research and report, to develop students to use their scientific knowledge, their ability to plan and execute an extended experimental or theoretical investigation and use all their communication skills to describe their results. To provide an understanding of some techniques of research, including the presentation of results. Students should have obtained an appreciation of research methodologies gained under individual supervision; ability to design and execute a project, write a report and give a talk on it. The student chooses the project in consultation with a member of staff.

Taught in Program(s)

As major in Program(s) Code(s)

Math, Computer Science and Artificial Intelligence and Data Science

As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Continuous

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Com 485	Elective Course (1)	3 CH
Prerequisites	Com 485	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	2	0

Required SWL	100	Equivalent ECTS	4

Course Content

The student chooses one of the proposed courses according to the interests of faculty members and students.

Taught in Program(s)					
As major in Program(s) Code(s)					
Math, Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☒ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	10%		20%		30%		40%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Com 471	Automation and formal languages		3 CH
Prerequisites	Com 471		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	0	
Required SWL	100	Equivalent ECTS	4
Course Content			
The course introduces some fundamental concepts in automata theory and formal languages including grammar, finite automaton, regular expression, formal language, pushdown automaton, and Turing machine. Not only do they form basic models of computation, they are also the foundation of many branches of computer science, e.g. compilers, software engineering, concurrent systems, etc. The properties of these models will be studied and various rigorous techniques for analyzing and comparing them will be discussed, by using both formalism and examples.			
Taught in Program(s)			
As major in Program(s) Code(s)			
Math, Computer Science and Artificial Intelligence and Data Science			
As minor in Program(s) Code(s)			
Targeted Sustainable Development Goals			
☒ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	10%		20%		30%		40%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Com 263	Guided Programming					3 CH
Prerequisites	-					
Number of weekly Contact Hours						
Lecture		Tutorial		Laboratory		
2		0		2		
Required SWL	-	Equivalent ECTS	-			
Course Content						
Structured programming, Introduction to data experiment and object-oriented software design, design methods in object-oriented programming, Select and implement, Build kinds of things with different levels of encapsulation						
Taught in Program(s)						
As major in Program(s) Code(s)						
Artificial Intelligence and Data Science						
As minor in Program(s) Code(s)						
Artificial Intelligence and Data Science						
Targeted Sustainable Development Goals						
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation	
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production	
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal		
Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
20%	10%		30%		40%	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
10%	10%		0%		10%	

Com 261	Programming language					3 CH
Prerequisites	Com 101					
Number of weekly Contact Hours						
Lecture		Tutorial		Laboratory		
2		0		2		
Required SWL	-	Equivalent ECTS	-			
Course Content						
Variables and input and output commands, Conditional sentences and loops, Functions, Iterative, Arrays, Indicators and texts, structures						
Taught in Program(s)						
As major in Program(s) Code(s)						
Artificial Intelligence and Data Science						
As minor in Program(s) Code(s)						
Artificial Intelligence and Data Science						
Targeted Sustainable Development Goals						
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation	
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and	

		Infrastructure			Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
20%	10%		30%		40%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	10%	0%	10%

Mat 215	**Mathematical Analysis (I)**		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	2	
Required SWL	-	Equivalent ECTS	-

Course Content

D3 space, vectors, all vectors, scalar product of vectors, vector length. Cartesian and vectorial equations in the triple space, the plane equation and the straight-line equation. Spherical and cylindrical coordinates, examples of surfaces. Functions in two variables, the end of functions defined on an area, functions in three variables and their limit, partial derivatives, calculating partial derivatives, the connection of functions in more than one variable, partial derivatives of higher orders, Taylor's theory of functions in two variables. Maximum and minimum values, saddle points, parameter-dependent integrals, successive integrals, defective integrals and methods for their estimation, linear integrals, double integrals by substitution, applications from linear to surface integral

Taught in Program(s)

As major in Program(s) Code(s)

Artificial Intelligence and Data Science

As minor in Program(s) Code(s)

Artificial Intelligence and Data Science

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
20%	10%		20%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	10%	10%	10%

Mat 205	**Discrete Mathematics**		3CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2		
Required SWL	-	Equivalent ECTS	-

Course Content

Logic-Groups- Counting: permutations, combinations. Relationships and equivalent relations. Partial arrangement. Algorithms and calculating the execution time of the algorithm. Arboreal structure. Diagrams, especially correlation and shortest path, Euler path. Boolean algebra: Boolean Functions, Gates, and Boolean Circuits.					
Taught in Program(s)					
As major in Program(s) Code(s)					
Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Artificial Intelligence and Data Science					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
20%	10%		20%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	10%	0%	10%

Mat 207	**Vector Analysis**		2CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	0		
Required SWL	-	Equivalent ECTS	-
Course Content			
Directional functions in one variable, regions and domains, limits and continuity, derivative, integration. Directional functions in several variables, partial derivative, Jacobi matrix. The famous differential effects and their expression in different coordinate systems, the implicit function theory, and the inverse function theory. Integration of vector functions in several variables, Green's theory and its applications, Stokes' theory and its applications. Path, Euler path. Boolean algebra: Boolean Functions, Gates, and Boolean Circuits.			
Taught in Program(s)			
As major in Program(s) Code(s)			
Artificial Intelligence and Data Science			
As minor in Program(s) Code(s)			
Artificial Intelligence and Data Science			
Targeted Sustainable Development Goals			
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
20%	10%		20%		50%	
Student Activities Breakdown (Distribution for Study Blocks)						

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	10%	10%	0%

Com 271	**Neural Networks**			2CH
Prerequisites				
Number of weekly Contact Hours				
Lecture		Tutorial		Laboratory
2		1		
Required SWL	-	Equivalent ECTS		-
Course Content				
Directional functions in one variable, regions and domains, limits and continuity, derivative, integration. Directional functions in several variables, partial derivative, Jacobi matrix. The famous differential effects and their expression in different coordinate systems, the implicit function theory, and the inverse function theory. Integration of vector functions in several variables, Green's theory and its applications, Stokes' theory and its applications. Path, Euler path. Boolean algebra: Boolean Functions, Gates, and Boolean Circuits.				
Taught in Program(s)				
As major in Program(s) Code(s)				
Artificial Intelligence and Data Science				
As minor in Program(s) Code(s)				
Artificial Intelligence and Data Science				
Targeted Sustainable Development Goals				

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
20%	10%		30%		40%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	10%	10%	0%

كود المقرر	Uni 209 اسم المقرر	التغيرات المناخية	الساعات المعتمدة 2 ساعة
المتطلبات الأساسية			
عدد ساعات الاتصال الاسبوعية	2		
المحاضرات	الفصول الدراسية	المعامل	
-	-	-	
-	ما يعادل ECTS	-	حمل الطالب المطلوب SWL

محتويات المقرر

التي حدثت في الماضي. تحديد المؤشرات الدالة على التغيرات المناخية التعرف على المبادئ الاساسية للتغيرات المناخية على التعرف على الأنظمة الطبيعية الموجودة في كل من اليابسة والمحيطات والغلاف الحيوى .التغيرات المناخية حدوث.

البرامج المطروح بها المقرر
التخصص الرئيسى (اسم وكود)
الذكاء الاصطناعى وعلوم البيانات

التخصص الفرعي (اسم وكود)
الذكاء الاصطناعى وعلوم البيانات

أهداف التنمية المستدامة المحققة					
☒١. القضاء على الفقر	☐٢. القضاء على الجوع وتحقيق الأمن الغذائي وتحسين التغذية وتعزيز الزراعة المستدامة	☒ ٣. الصحة الجيدة والرفاه ضمان حياة صحية جيدة وتعزيز الرفاهية للجميع في جميع الأعمار	☐ ٤. ضمان توفير تعليم جيد وفرص تعلم مدى الحياة للجميع.	☐٥. تحقيق المساواة بين الجنسين وتمكين جميع النساء والفتيات.	☐٦. ضمان توفير المياه النظيفة والصرف الصحي للجميع.
☐٧. ضمان الوصول إلى الطاقة الميسورة والنظيفة والمستدامة للجميع.	☒٨. تعزيز النمو الاقتصادي الشامل والذي يوفر فرص العمل اللائقة للجميع.	☒٩. بناء بنية تحتية قوية، ومرونة، وتعزيز قطاع الأعمال، والابتكار.	☐ ١٠. تقليل التفاوتات داخل الدول وبينها	☐١١. جعل المدن، والمجتمعات مفتوحة، وآمنة، ومستدامة.	☐١٢. ضمان استهلاك وإنتاج مستدام.
☐١٣. اتخاذ تدابير فورية لمكافحة تغير المناخ وتأثيراته	☐١٤. حماية الحياة البحرية واستغلالها بطريقة مستدامة	☐١٥. حماية الحياة البرية والتصدي لانقراض الكائنات الحية.	☐١٦. تعزيز مجتمعات سلمية وعادلة وقوية.	☐١٧. تعزيز الشراكة من أجل تحقيق الأهداف.	

توزيع نسب التقييم						
الأنشطة الطلابية	اختبار منتصف الفصل الدراسي		العملى / الشفوي		التقييم النهائي	
	☒ تقييم	☒ اختبار	☐ اختبار عملى	☒ اختبار شفوي	☐ تقييم	☒ اختبار
	40		10		50	

تصنيف الأنشطة الطلابية على أساس نظام الوحدة			
السمنار	التعلم الذاتي	المشروع	قطاع الأعمال
-	-	-	-

المواصفات الأساسية لمقررات الفرقة الرابعة الترم الثانى

Compulsory Courses (12 Credit Hours)

Com 496	Web & Social Media Analytics		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	0	
Required SWL	100	Equivalent ECTS	3

Course Content

Social media has revolutionized various aspects of life, including knowledge production, communication, and resource management. It has also provided vast amounts of social data for analysis, offering new research opportunities and computational challenges. This course focuses on social data analysis, examining topics like influence, information diffusion, topic modeling, sentiment analysis, and predicting behavior. Students should have proficiency in programming, algorithms, and data structures, and have taken college-level courses in linear algebra and statistics.

Taught in Program(s)					
As major in Program(s) Code(s)					
Math, Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		10%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Mat 420	Mathematical Modeling		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	0	
Required SWL	100	Equivalent ECTS	4
Course Content			
Improper integrals, convergence and absolute convergence, tests for absolute convergence and conditions for improper integrals, beta and gamma functions and their applications, number sequences, convergence and the Cauchy condition, endpoints and partial sequences, Bolzano and Verstrass theorem, connection relationship with sequences, regular connection, number series and convergence tests, sequences and series of functions , point convergence and uniform convergence, Weierstrass theorem and power series, the relationship between convergence and calculus operations, Taylor and Maclaurin series, Fourbier series.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		10%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Com 498	Neural network and deep learning		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	0	
Required SWL	100	Equivalent ECTS	4
Course Content			
Neural networks have experienced multiple waves of popularity over the past 50 years, promising general-purpose artificial intelligence. The first wave was crushed by limitations in techniques, but advances allowed neural networks to discover internal representations. The second wave died out as more elegant algorithms were developed. In 2010, a third resurgence occurred due to faster computers and larger data sets. The 1980s algorithms are now state-of-the-art in computer vision, speech recognition, and natural language processing, improving daily life.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		10%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
0%	0%	0%	0%

Com 490	Scientific research	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	0	0

Required SWL	100	Equivalent ECTS	2

Course Content

The project of research and report, to develop students to use their scientific knowledge, their ability to plan and execute an extended experimental or theoretical investigation and use all their communication skills to describe their results.To provide an understanding of some techniques of research, including the presentation of results. Students should have obtained an appreciation of research methodologies gained under individual supervision; ability to design and execute a project, write a report and give a talk on it. The student chooses the project in consultation with a member of staff.

Taught in Program(s)					
As major in Program(s) Code(s)					
Computer Science and Artificial Intelligence and Data Science					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights				
Student	Midterm (MT)	Ongoing evaluation	Practical / Oral Exam (PE)	Final (FE)

Activities (SA)	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		10%		10%		60%	
Student Activities Breakdown (Distribution for Study Blocks)								
Seminar-based (SB)		Self-learning-based (SL)			Project-based (PB)		Industry-based (IB)	
0%		0%			0%		0%	

Optional Courses(students should choose 4 credit Hours including 2 hrs. of university requirements)

Com 486	Elective Course (2)	3 CH
Prerequisites	Mat106	
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	2	0
Required SWL	100	Equivalent ECTS 4
Course Content		
The student chooses one of the proposed courses according to the interests of faculty members and students.		
Taught in Program(s)		
As major in Program(s) Code(s)		
Math, Computer Science and Artificial Intelligence and Data Science		
As minor in Program(s) Code(s)		
Targeted Sustainable Development Goals		

☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger	☒ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☒ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
0%	20%		10%		10%		60%	
Student Activities Breakdown (Distribution for Study Blocks)								
Seminar-based (SB)		Self-learning-based (SL)			Project-based (PB)		Industry-based (IB)	
0%		0%			0%		0%	

Com 462	Design Web Pages	2 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	1	0
Required SWL	100	Equivalent ECTS 3
Course Content		
Use HTML to build a web page Page title, page components, formatting, image and sound insertion. Your use of ready-made software.		

Taught in Program(s)

As major in Program(s) Code(s)											
Computer Science and Artificial Intelligence and Data Science											
As minor in Program(s) Code(s)											
Targeted Sustainable Development Goals											
☐ GOAL 1: No Poverty	☒ GOAL 2: Zero Hunger		☒ GOAL 3: Good Health and Well-being		☒ GOAL 4: Quality Education		☒ GOAL 5: Gender Equality		☐ GOAL 6: Clean Water and Sanitation		
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth		☒ GOAL 9: Industry, Innovation and Infrastructure		☐ GOAL 10: Reduced Inequality		☒ GOAL 11: Sustainable Cities and Communities		☒ GOAL 12: Responsible Consumption and Production		
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water		☒ GOAL 15: Life on Land		☐ GOAL 16: Peace and Justice Strong Institutions		☐ GOAL 17: Partnerships to achieve the Goal				
Assessment Weights											
Student Activities (SA)	Midterm (MT)		Ongoing evaluation		Practical / Oral Exam (PE)		Final (FE)				
	☐ Assessment	☒ Exam	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam			
0%	20%		10%		10%		60%				
Student Activities Breakdown (Distribution for Study Blocks)											
Seminar-based (SB)			Self-learning-based (SL)			Project-based (PB)			Industry-based (IB)		
0%			0%			0%			0%		

محتوى المقررات الاختياريه والاجباريه لمتطلب الجامعه

مقررات المستوى الأول (الاجباريه)

Uni 107: Societal issues - 2 Credit (Lecture 2h/w) القضايا المجتمعية

المحتوى: يتكون هذا المقرر من بابين الأول اجباري ويحتوي على اربعه فصول كلاتي:
الفصل الأول: المشكلات المترتبه على الزياده السكانية واثرها على الصحه الإنجابية.
الفصل الثاني : حقوق الانسان
الفصل الثالث: الشفافيه ومكافحة الفساد.
الفصل الرابع: سماحة الأديان واداب الحوار مع الاخر.
والباب الثاني اختياري ويتكون من فصلين:
الفصل الخامس: التربيه الاعلاميه الرقمية
الفصل السادس: يحدده مجلس الكلية.
المراجع: القضايا المجتمعية -ا.د السيد محمد دعدور - رئيس جامعة دمياط.

Uni 108: English for science -2 Credit (Lecture 2h/w) اللغه الانجليزية

Contents: Coverage of selected scientific terminology, with the objective of familiarizing the students with the English terms and their Arabic counter parts, focusing on the spelling and pronunciation of these terms. Coverage of some areas in traditional English grammar, particularly those problematic for the students at this stage.

References:

Ann Raimes. (1999): Keys for Writers: A Brief Handbook, 2nd ed., New York: Houghton Mifflin Company.
Enani, M.M. (1996): Essay Writing. Cairo: Cairo University Press.
John and Liz, S. (1996): Headway: Pre-intermediate level, Oxford University Press.

Uni 109: Information Technology - 2 Credit (Lecture 2h/w) تكنولوجيا المعلومات

Contents: The syllabus consists of five major modules: 1- Information Systems: To give

students a broad foundation of basic computing/data is processing knowledge and skills. 2: Human communication and Business Organization: To provide students with the necessary written and verbal communication skills to enable them to relate to others on computing and non-computing matters- To give the student an understanding of the information needs of organizations, the various types of organization and the various ways that Information- Technology permeates within organizations. 3: Software: To become familiar with the various types of software categories and their capabilities- Students will develop skills to use generic software especially of database and spreadsheet nature. 4: Programming Techniques and System Development: To give students knowledge of the necessary techniques needed to implement algorithmic design using a high-level language, which is object oriented (Java), as well as creating, testing and maintaining the implemented systems. (A working knowledge of a high levelprogramming language at SEC level is recommended.) 5: Exercises: To give students the opportunity to put into practice concepts learnt during the course.

References: Ralph M. Stair and George W. Reynolds: "Principles of Information Systems", 2018

المستوى الثانى (الاختياريه)

Uni 209: Innovation and entrepreneurship - 2 Creditالتغيرات المناخية

المحتوى:توصيف التي حدثت في الماضي. تحديد التغيرات المناخية التعرف على .المناخية المبادئ الأساسية للتغيرات على الأنظمة الطبيعية الموجودة في كل من التغيرات المناخية شرح تأثيرات .التغيرات المناخية المؤشرات الدالة على حدوث اليابسة والمحيطات والغلاف الحيوى.

المراجع

Change, I. P. O. C. (2007). Climate change 2007: The physical science basis. *Agenda*, *6*(07), 333.

Uni 211: History of Ancient Egypt - 2 Creditتاريخ مصر القديم

دراسة تاريخ مصر منذ عصر ما قبل الكتابة حتى نهاية العصر القديم، والمصادر التى يستقى منها المادة العلمية وطبيعتها، وأصل المصريين، فترة ما قبل الأسرات، والدولة القديمة و الانتقال الاول، والدولة الوسطى والانتقال الثانى، والدولة الحديثة. عصر الأسرات المتأخرة حتى الفتح المقدونى، والنظام السياسى والادارى فى مصر، ومظاهر الحضارة المصرية، وحالة مصر الاقتصادية والاجتماعية، والديانة المصرية القديمة.

Uni 212: Psychology and Sociology - 2 Creditعلم النفس والاجتماع

تعريف غير المتخصصين فى علم النفس بمدى الاستفادة منه فى تفسير بعض الظواهر الفلسفية، والتعريف بطبيعة علم النفس وأهم أهدافه ومجالاته. دراسة بعض العمليات العقلية العليا كالانتباه والادراك، والتعلم والتذكر، ودراسة الشخصية الانسانيه، ودراسة الانفعالات. استيعاب أهم المفاهيم والنظريات ذات الصلة بموضوعات علم النفس الاجتماعى، وفهم أسس التفاعل الاجتماعى بين الافراد، والوقوف على

محدداته وآثاره، وتوظيف المعرفة فى مجال علم النفس الاجتماعى فى المجالات التطبيقية، وتنمية مهارات البحث المكتبى والميدانى المتصلة بموضوعات المادة. دراسة موضوع علم الاجتماع، وأهم المصطلحات السوسيولوجية، ومناهج البحث فى علم الاجتماع، والتنمية البشرية، والثقافة. دراسة الفروع السوسيولوجية: علم اجتماع التنمية، وعلم الاجتماع الريفى وعلم الاجتماع الطبى.

Uni 213: History and Philosophy of Science - 2 Credit تاريخ وفلسفة العلوم

التعرف على تاريخ العلم فى الحضارة الاسلامية، والتعرف على دور العرب فى تطوير العلم، واستكمال الوعى بمكونات هويتنا الحضارية. دراسة ماهية العلم العربى، والاطار الحضارى للعلم العربى، والاسس المنهجية لدراسة العلم العربى، وترجمة التراث الاجنبى إلى اللغة العربية. أهم العلماء)جابر بن حيان– والرازى – وابن سينا – وابن الهيثم(. دراسة مدخل إلى فلسفة العلم)الفلسفة، والفلسفة العلمية، وفلسفة العلم(، ودلالات العلم) البحث والتطبيق، والمنهج والمحتوى المعرفى، والعلم واللاعلم(. العلم فى المجتمع والتاريخ.

Uni 214 : Ethics of Scientific Research-2 Credit أخلاقيات البحث العلمى

المبادئ الاساسيهلاخلاقيات البحث العلمى. شروط البحث العلمى. المعأيير المنهجية للبحث العلمى. حقوق الملكية الفكرية.التشريعات المصرية فى مجال حماية حقوق الملكية الفكرية. اليات نشر وتطبيق اخلاقيات البحث العلمى. اخلاقيات الاقتباس.

Uni 215: Laboratory Safety - 2 Credit الامان المعملى

مصادر الخطوره في المختبرات (المخاطر الطبيعيه – المخاطر الكيميائيه- الأشعه- المخاطر البيولوجيه) السلامه والوقايه الشخصيه الاسعافات الاوليه وترتيبات المعمل التخلص من النفايات المعمليه ، السلامه في الدراسات الحقليه.

Uni 216: Skills of Scientific Research - 2 Credit مهارات البحث العلمى

مفهومالبحثالعلمى،اسسالبحثالعلمى،مناهجالبحثالعلمى،أنواعالبحثالعلمى،صفاتالباحثالمتميز،مهاراتالبحثالعلمى،خطواتالبحثالعلمى، تحديدالهدفمنالبحث،اختيارالموضوعوالقراءةحوله،تحريرعنوانالبحث،وضعالخطةالمنهجيه للبحثواعتمادهامنجهاتالاختصاص وأصولالاقتباسوالترجمة.

Uni 210: Innovation and entrepreneurship - 2 Credit الابتكار وريادة الاعمال

Contents: This course deals with the study of leadership behaviour and its importance in building the personality in the institutions and society and knowing the relationship between the leadership and innovation. It also includes a detailed discussion of the personal characteristics of innovators, factors of innovation success and developing the administrative processes, knowing the criteria for building and developing the innovative behavior and practical cases and applications in leadership and management of innovation.

References:

Vaccaro, I. G., Jansen, J. J., Van Den Bosch, F. A., & Volberda, H. W. (2012). Management innovation and leadership: The moderating role of organizational size. *Journal of management studies*, *49*(1), 28-51.

Uni 218: History of Modern Egypt - 2 Credit تاريخ مصر الحديث

معرفة أوضاع المجتمع المصرى فى العصر العثمانى، والحملة الفرنسية وآثارها المختلفة على الصعيدين الخارجى والداخلى.

مشروع التحديث فى عصر محمد على، وموقف القوى الخارجية من ازدياد النفوذ الاجنبى فى مصر، والاحتلال البريطانى لها. دراسة المجتمع المصرى فى العصر العثمانى، والحملة الفرنسية والمجتمع المصرى .الفوضى السياسية فى مطلع القرن19 ،ومحمد على وتجربة التحديث. مظاهر النفوذ الاجنبى فى مصر فى النصف الثانى من القرن 19 ،والثورة العرابّية والاحتلال البريطاني.

Uni 219: Environmental Culture - 2 Credit الثقافة البيئية

الاطلاع على أحوال البيئة العالمية، والتعرف على المتغيرات البيئيهالاساسيه، والتعرف على مظاهر التلوث وأنماطه، والتوجيه إلى حماية البيئة فى الاغلفه الاربعة، و بيان السبب فى دراسة البيئة.

Uni 220: Philosophy and Critical Thinking - 2 Credit الفلسفة والتفكير النقدي

يحدد موضع التفكير النقدي بين صور التفكير الانساني ومستويات هو أنماطه المختلفة- .يعرف ماهية التفكير النقدي ومهاراته المختلفة- .يكتشف الاخطاء الشائعة في التفكير -يميز بين أنماط التفكير الصحيحة وغير الصحيحة- .يطبق مهارات التفكير النقدي في المواقف الحياتية المختلفة- .يوظف التفكير النقدي والمنطقي في حل المشكلات، واتخاذ القرارات المتنوعة- يّبني الحجج المنطقية، ويفسرها، ويقيمها- .يكتشف مدى صدق وصحة الحجج، وجوانب القوة والضعف فيها- .يحلل الحجج الاستنباطّية والاستقرائيه وينتقدها.

Uni 221: Communication Skills - 2 Credit مهارات التواصل

يقدم المقرر مهارات أساسية في الكتابة والتواصل الشخصي مع الآخرين للأغراض العلمية والعملية مما يمكّن الطالب من تقديم ذاته والتعبير بشكل فعال عما يريد إيصاله من معلومات وأفكار وكذلك التعامل مع المعلومات التي يقدمها الغير. - فهم معنى السيرة الذاتية ومعرفة دورها وأهميتها وكيفية توظيفها للتقدم إلى فرصة ما. - معرفة دور رسالة الإرفاق وتكاملها مع السيرة الذاتية، والاستعداد للمقابلة الشخصية. - فهم معنى الاستطلاع أو المسح الاستبياني ومعرفة دوره وأهميته وكيفية توظيف نتائجه. - تصميم الاستبيان وإجراء المسح الاستبياني وتفريغ نتائجه. - معرفة معنى البحث العلمي وكيفية إجرائه. - كيفية تقديم نتائج البحث العلمي في تقرير احترافي. - معرفة أنواع التواصل المباشر وفهم معنى المحاضرة وخصوصيتها. - تصميم مادة محاضرة ومعرفة كيفية إلقائها والاستعداد لذلك وإدارة النقاش خلالها.

Uni 222: Fitness - 2 Credit الصحة واللياقة

يركز مقرر الصحه واللياقه على الجانب المتعلق بمهارات تطوير الذات من الناحية الصحية والجسدية، وما يرتبط بها من مهارات تتعلق
بالصحة الشخصية والغذائية والرياضية والوقائية والنفسية والإنجابية والإسعافات الأولية، مع التركيز على المواقف الحياتية، بهدف إثارة دافعية الطلاب وتشويقهم
لعملية التعلم من خلال الإطار العام للمقرر ومعاييره وضوابطه. أما عن وصف اللياقة البدنية فيتمثل دورها بممارسة التمرينات البدنية للمحافظه على الصحة باستخدام
الأجهزة الحديثة والتعلم بالترفيه وممارسة بعض الأنشطة الرياضية .

Uni 223: Biodiversity Conservation and Sustainability - 2 Credit

التنوع الحيوي والتنمية المستدامة

Introduce students in an integrative manner to the field of biodiversity conservation and how to apply its principles to best promote sustainability. Understanding biodiversity and its management requires an interdisciplinary approach with particular reference to mechanisms of change and human impacts on the environment. This course will be interdisciplinary in its approach.

Uni 224: Political Science and International Relations - 2 Credit

العلوم السياسية والعلاقات الدولية

تتناول هذه المادة ماهية و مفاهيم، علم العلاقات الدولية والذي يعد المجتمع الدولي مادته، وعلاقة علم العلاقات الدولية بباقي العلوم الاجتماعية الأخرى، وصولاً لتحديد ماهية الشخص الدولي كمدخل للوقوف على تعدد أشخاص هذا المجتمع، وتفسيرهم من خلال مجموعة معايير ذات الدلالة بقصد تحديد مكانة ودور كل منهم على الساحة وأطراف العلاقات الدولية و المناهج المعاصرة في دراسة العلاقات الدولية بالإضافة الى مدارس العلاقات السياسية الدولية كما يتم تناول مبادئ العلاقات الدولية والعوامل المؤثرة فيها و تطور العلاقات الدولية بين الحربين العالميتين خلال الحرب العالمية الثانية و العلاقات السياسية الدولية في عصر الامم المتحدة وفي ظل الحرب الباردة وانعكاساتها على العلاقات السياسية الدولية بالإضافة للعلاقات الدولية في ظل العولمة.

قسم الرياضيات

2-المقررات الدراسية لبرنامج الرياضيات ودعم اتخاذ القرار

Curriculum of Mathematics and Decision Making Support (MDMS) Program

(برنامج منفرد بمصروفات)

First Level (freshman) - Courses of Physical Science programs

Semester	Course code	Course name		Prerequisites	Hours				Grades					
					Theoretical	Practical	Exercises	Credit Hours	Midterm	Ongoing evaluation	Oral exam	Practical exam	Final exam	Total
Compulsory Courses (11 Credit Hours)														
First	Mat 111	Calculus (I)	رياضيات بحتة (1)	-	2	-	1	2	20	20	10	-	50	100
	Mat 151	Mechanics I	رياضيات تطبيقية 1	-	2	-	1	2	20	20	10	-	50	100
	Chm101	General chemistry (I)	كيمياء عامه 1	-	2	3	-	3	10	20	10	20	40	100
	Phy111	Physics (I)	فيزياء عامه 1	-	2	3	-	3	10	20	10	20	40	100
	Bot 111	General Botany	نبات عام		1	3	-	2	10	20	10	20	40	100
	Com101	Computer Applications	تطبيقات الحاسب	-	1	2	-	2	10	20	10	20	40	100
	Uni 107	Social issues	قضايا مجتمعية	-	2	-	-	0	ماده نجاح ورسوب فقط				25	50
	Uni 101	Information technology	نظم معلوماتية	-	2	-	-	2	20	20	10	-	50	100
Total								16						700
Second	Mat112	Calculus (II)	رياضيات بحتة (2)		2	-	1	2	20	20	10	-	50	100
	Mat 152	Mechanics (II)	رياضيات تطبيقية (2)		2	-	1	2	20	20	10	-	50	100
	Chm102	General Chemistry (II)	كيمياء عامه 2		2	3	-	3	10	20	10	20	40	100
	Phy112	Physics (II)	فيزياء 2		2	3	-	3	10	20	10	20	40	100
	Zoo 111	General zoology	حيوان عام		1	-	3	2	20	20	10	-	50	100
	Com112	Computer Programming I	اساسيات الحاسب 1		1	2	-	2	10	20	10	20	40	100
	Uni 102	Scientific English	لغة انجليزية للعلوم	-	2	-	-	2	20	20	10	-	50	100
Total								16						700
Total for both semesters								32						1400

Second Level (Junior) - Courses of Math. Program

semester	Course code	Course name		Prerequisites	Hours				Grades					
					Theoretical	Practical	Exercises	Credit Hours	Midterm	Ongoing evaluation	Oral exam	Practical exam	Final exam	Total
Compulsory Courses (13 Credit Hours)														
First	Mat 207	Ordinary Differential Equations	معادلات تفاضلية عادية		2	-	1	2	20	20	10	-	50	100
	Mat 203	Decision Theory	نظرية القرار	-	2	-	2	3	20	20	10	-	50	100
	Mat 205	Linear Programming	برمجة خطية	-	2	-	2	3	20	20	10	-	50	100
	Sta 203	Data Analysis	تحليل البيانات		2	-	2	3	20	20	10	-	50	100
	Com 201	Computerized Office Applications	تطبيقات المكاتب المحوسبة		2	-	1	2	20	10	10	20	40	100
	Optional Courses (students should choose 4 credit Hours including 2 hrs. of university requirements)													
	Mat 201	Mathematical Modeling	النمذجة الرياضية		2	-	1	2	20	20	10	-	50	100
	Mat 211	Mathematics in our life	الرياضيات في حياتنا	-	2	-	1	2	20	20	10	-	50	100
	Sta 201	Advanced Statistics	الاحصا ء المتقدمة		2	-	1	2	20	20	10	-	50	100
	Uni 209	University requirement	متطلب جامعه		2	-	-	2	20	20	10	-	50	100
Total								17						700
	Compulsory Courses (13 Credit Hours)													
Second	Mat 202	Discrete Mathematics	الرياضيات المتقطعة		2	-	1	2	20	20	10	-	60	100
	Mat 204	Applied Numerical Methods	الطرق العددية التطبيقية		2	-	2	3	20	20	10	-	60	100
	Mat 206	Applied Differential Equations	المعادلات التفاضلية التطبيقية	Mat 203	2	2	-	3	20	20	10		60	100
	Sta 202	Principles of Sampling Theory	مبدأ نظرية العينات		2	-	1	2	20	20	10	-	60	100
	Com 202	Information Retrieval Systems	أنظمة استرجاع المعلومات		2	-	2	3	20	10	10	20	40	100
	Optional Courses (students should choose 4 credit hours including 2 hrs. of university requirements)													
	Com 274	Simulation and Modeling	النمذجة و المحاكاة	-	2	-	1	2	20	10	10	20	40	100
	Mat 208	History of Mathematics	تاريخ الرياضيات		2	-	1	2	20	20	10	-	50	100
	Uni 210	University requirement	متطلب جامعه		2	-	-	2	20	20	10	-	50	100
Total								17						700
Total for both semesters								34						1400

Third Level (Junior) - Courses of Math. Program

Semester	Course code	Course name		Prerequisites	Hours				Grades					
					Theoretical	Practical	Exercises	Credit Hours	Midterm	Ongoing evaluation	Oral exam	Practical exam	Final exam	Total
	Compulsory Courses (14 Credit Hours)													
First	Mat 301	Mathematical Logic	المنطق الرياضي		2	-	2	3	20	20	10	-	60	100
	Mat 305	Decision Making Skills	مهارات اتخاذ القرار		2	-	2	3	20	20	10	-	60	100
	Mat 307	Approximation Theory	نظرية التقريب		2	-	2	3	20	20	10	-	60	100
	Sta 301	Statistical Quality Control	مراقبة الجودة الإحصائية		2	-	2	3	20	20	10	-	60	100
	Com 301	Decision Support Systems	نظم دعم القرار		2	-	1	2	20	10	10	20	40	100
	Optional Courses (3 Credit Hours)													
	Mat 303	Optimization Techniques	تقنيات التحسين	Mat 202	2	-	2	3	20	20	10	-	50	100
	Com 303	Data Mining and Data structures	بيانات التنقيب و تراكيب البيانات	Com385	2	-	2	3	20	10	10	20	40	100
Total								17						600
	Compulsory Courses (14 Credit Hours)													
Second	Mat 304	Multicriteria Decision Making	إتخاذ القرارات متعددة المعايير		2	-	2	3	20	10	20	-	50	100
	Mat 302	Technical Mathematics for Industry	الرياضيات التقنية للصناعة		2	-	2	3	20	10	20	-	50	100
	Mat 306	Topology	توبولوجي		2	-	2	3	20	10	20	-	50	100
	Sta 304	Multivariate Data Analysis	تحليل البيانات متعددة المتغيرات	Sta 303	2	-	2	3	20	10	20	-	50	100
	Com 302	Project Planning & Scheduling	تخطيط وجدولة المشاريع		2	-	2	2	20	10	10	20	40	100
	Optional Courses (3 Credit Hours)													
	Sta 306	Applied Optimization Methods	طرق التحسين المطبقة		2	-	2	3	20	20	10	-	50	100
	Mat 328	Special Course (1)	مقرر خاص (1)	--	2	-	2	3	20	20	10	-	50	100
Total								17						600
Total for both semesters								34						1200

Fourth Level (Senior) - Courses of Math. Program

Semester	Course code	Course name		Prerequisites	Hours				Grades					
					Theoretical	Practical	Exercises	Credit Hours	Midterm	Ongoing evaluation	Oral exam	Practical exam	Final exam	Total
	Compulsory Courses (14 Credit Hours)													
First	Mat 407	Optimal Control	التحكم الأمثل		2	-	1	2	20	20	10	-	50	100
	Mat 403	Mathematics for Solving Problems	الرياضيات لحل المشكلات		2	-	1	2	20	20	10	-	50	100
	Sta 401	Generalized Linear Models	النماذج الخطية المعممة		2	-	1	2	20	20	10	-	50	100
	Mat 401	Theoretical Aspects of Reasoning about Data (Rough Sets)	الجوانب النظرية للتفكير حول البيانات		2	-	2	3	20	20	10	-	50	100
	Mat 409	Field Training	تدريب حقلي		3	40% Report - 40% Supervision-20% Discussion								100
	Mat 424	Project	بحث ومقال	-	2	Continuous								
		Optional Courses (3 Credit Hours)												
	Com401	Computer Graphics	رسومات الحاسب		2	-	2	3	20	10	10	20	400	100
	Mat 405	Special Course (2)	مقرر خاص (2)	--	2	-	2	3	20	20	10	-	50	100
Total								17						700
		Compulsory Courses (14 Credit Hours)												
Second	Mat 406	Numerical Solutions of Integral Equations	حلول عددية للمعادلات التكاملية		2	-	2	3	20	20	10	-	50	100
	Mat 402	Topological Data Analysis	تحليل البيانات التوبولوجية		2	-	2	3	20	20	10	-	50	100
	Com 492	Artificial Intelligence Applications	تطبيقات الذكاء الاصطناعي		2	-	2	3	20	10	10	20	40	100
	Sta 402	Life and Validity Tests	اختبارات العمر الافتراضى و الصلاحية		2	-	2	3	20	20	10	-	50	100
	Mat 424	Project	بحث ومقال	-	2	20% Report-20% Supervision- 60% Discussion								100
		Optional Courses (3 Credit Hours)												
	Com 402	Design Web Pages	تصميم صفحات الانترنت		2	-	1	2	20	10	10	20	40	100
	Mat 404	**Special Course (3)**	**مقرر خاص (3)**		2	-	2	3	20	20	10	-	50	100
Total								17						700
Total for both semesters								35						1400

قسم الرياضيات
توصيف مقررات برنامج الرياضيات ودعم اتخاذ القرار
Course Description of "MDMS" Program
(برنامج منفرد بمصروفات)

Level (1)

Course Code: Mat 111	Course Name: Calculus (I)	3 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	2	-
Required SWL	-	Equivalent ECTS	-
Course Content		
Introduction to Mathematical logic, equivalence relations, functions, Mathematical induction, binary operations, groups (basic properties and results), exchange groups, rings and fields (basic properties and results). Functions and Models. Limits and Derivatives. Differentiation Rules. Applications of Differentiation.		

Taught in Program(s)					
As major in Program(s) Code(s)					
Phy program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 151	Course Name: Mechanics (I)	3 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	2	-
Required SWL	-	Equivalent ECTS	-
Course Content		
Statics: vector algebra - forces - moments - couplings - equilibrium of forces - center of gravity.		

Taught in Program(s)
As major in Program(s) Code(s)
Phy program
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 112	Course Name: Calculus (I I)		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	-	
Required SWL	-	Equivalent ECTS	-
Course Content			
Definite and indefinite integrals, techniques of integration, improper integrals, infinite series, applications. Analytical geometry (Transformation of Coordinates, Pairs of Straight Lines, Analysis of Circles, Conic Sections) .			

Taught in Program(s)
As major in Program(s) Code(s)
Phy program
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam

20	20	10	50

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 152	Course Name: Calculus (I I)	3 CH
Prerequisites		

Number of weekly Contact Hours

Lecture	Tutorial	Laboratory
2	2	-

Required SWL	-	Equivalent ECTS	-

Course Content

Dynamics: movement of a material point in a straight line - projectiles - simple harmonic motion -impulse and collision.

Taught in Program(s)

As major in Program(s) Code(s)

Phy program

As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Level (2)

Course Code: Sta 201	Course Name: Advanced Statistics	2 CH
Prerequisites		

Number of weekly Contact Hours

Lecture	Tutorial	Laboratory
2	1	-

Required SWL	-	Equivalent ECTS	-

Course Content

Recapitulation of basic statistical concepts; Descriptive statistics (measures of location and dispersion);

Distributions Graphical representation of data Contingency tables Correlation and linear regression; Hypothesis testing; Fundamentals of modeling; Multiple testing and the corresponding correction methods; Graphical presentation of higher dimensional data; Multivariate regression, linear and polynomial Analysis of variance including interaction; Factor analysis; Topics according to request.

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 201	Course Name: Mathematical Modeling		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	-	
Required SWL	-	Equivalent ECTS	-

Course Content

This course is an introduction to mathematical modeling using graphical, numerical, symbolic, and verbal techniques to describe and explore real-world data and phenomena. Emphasis is on the use of elementary functions to investigate and analyze applied problems and questions, supported by the use of appropriate technology, and on effective communication of quantitative concepts and results.

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**

□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 203	Course Name: Decision Theory		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	-	
Required SWL	-	Equivalent ECTS	-

Course Content

This course will introduce students to normative and descriptive decision theory. As such, the emphasis will be on the main conceptual features of decision processes, on the quantitative estimation of qualitative judgments, and on their application to real life problems. This course is designed for students to build an understanding of how to improve the judgments and decision-making of individuals, groups and organizations. Normative and behavioral decision theories provide the theoretical core of the course. These theories draw on insights form a diverse set of disciplines, including logic and philosophy, economics, cognitive and social psychology, probability and statistics. This course will cover 3 fundamental aspects in decision analysis: Normative individual models, which focuses on classical decision theory, i.e. on the normative models of rational choice under uncertainty and risk; Competitive and Cooperative models, which focuses on Game Theory and Social Decision Theory, i.e. on the normative approach undertaken in competitive and cooperative theories. Descriptive models, which focuses mainly on Behavioral Economics, i.e. on actual decision behaviors and their neuroscientific/psychological explanation. Applications of these theories and methods to real-life venues will be used.

Taught in Program(s)

As major in Program(s) Code(s)

Mat program

As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 205	Course Name: Linear Programming		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	-	
Required SWL	-	Equivalent ECTS	-

Course Content

In this course, you will learn how to model real world problems as linear programs, you will learn how to solve them with state-of-the-art solvers, and we will study the theory behind linear programming solvers. Topics we cover include the simplex method, linear programming duality, sensitivity analysis, network-type problems, interior point methods and (if time permits) an introduction to discrete optimization and integer programming.

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Sta 203	Course Name: Data Analysis	3 CH
Prerequisites		
Number of weekly Contact Hours		

Lecture	Tutorial	Laboratory
2	2	-

Required SWL	-	Equivalent ECTS	-

Course Content

This course prepares students to gather, describe, and analyze data, and use advanced statistical tools to make decisions on operations, risk management, finance, marketing, etc. Analysis is targeted economic and financial decisions in complex systems that involve multiple partners. Topics include probability, statistics, hypothesis testing, regression, clustering, decision trees, and forecasting.

Taught in Program(s)

As major in Program(s) Code(s)

Mat program

As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 207 Course Name: Ordinary Differetial Equations 2 CH

Prerequisites

Number of weekly Contact Hours

Lecture	Tutorial	Laboratory
2	1	-

Required SWL	-	Equivalent ECTS	-

Course Content

Introduction to ordinary differential equations (ODEs), methods for solving first-order ODEs, homogeneous nth-order differential equations with constant coefficients and their solutions, non-homogeneous nth-order differential equations with constant coefficients and their solutions, ODEs with variable coefficients, analytical and numerical methods for solving ODEs.

Taught in Program(s)

As major in Program(s) Code(s)

Mat program

As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 211	Course Name: Mathematics in our life		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	-	
Required SWL	-	Equivalent ECTS	-

Course Content

Mathematical Principles for Problem Solving, The Three-Way Principle of Mathematics, Identifying & Organizing Relevant Information in Mathematics, Polya's Four-Step Problem-Solving Process, Basic Numerical Problem Solving Skills. Understanding Fractions, Decimals & Percentages, What is a Fraction? - Definition and Types, Comparing & Ordering Fractions, Decimals Percent's, Changing Between Decimals and Fractions, Changing Between Decimals and Percent's, Understanding Proportions, Ratios & Averages, Basics of Scientific Notation.

Taught in Program(s)
As major in Program(s) Code(s)
Mat program
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 202	Course Name: Discrete Mathematics	2 CH
Prerequisites		

Number of weekly Contact Hours

Lecture	Tutorial	Laboratory
2	1	-

Required SWL	-	Equivalent ECTS	-

Course Content

This course covers elementary discrete mathematics for computer science and engineering. It emphasizes mathematical definitions and proofs as well as applicable methods. Topics include formal logic notation, proof methods; induction, well-ordering; sets, relations; elementary graph theory; integer congruence's; asymptotic notation and growth of functions; permutations and combinations, and counting principles.

Taught in Program(s)

As major in Program(s) Code(s)

Mat program

As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 204	Course Name: Applied Numerical Methods	3 CH
Prerequisites		

Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		2		-	
Required SWL	-		Equivalent ECTS	-	

Course Content

Taylor series. Nested multiplication and Horner's algorithm. Floating-point representation. Roundoff error. Loss of significance. Nonlinear Equations: Bisection method. Newton's method. Secant method. Fixed-point iteration. Interpolation and Numerical Differentiation: Polynomial interpolation. Cubic splines. B-splines. Estimating derivatives. Numerical Integration: Trapezoid, Simpson's and Newton-Cotes rules. Gaussian quadrature's. Linear Systems: Gaussian elimination. Gaussian elimination with scaled partial pivoting. Condition Numbers. Tridiagonal and banded systems. LU decomposition. Eigenvalues and eigenvectors. Singular value decomposition. Power method. Aitken acceleration. Inverse and shifted inverse power method. Linear least squares. Initial Values Problems: Vector fields. Taylor series methods. Euler's method. Types of errors. Runge-Kutta methods. Partial Differential Equations: Parabolic problems: heat equation model. Finite-differences and Crank-Nicolson methods. Hyperbolic problems: wave equation model. Lax and upwind models. Elliptic problems: Helmholtz equation. Finite-element methods.

Taught in Program(s)

As major in Program(s) Code(s)

Mat Program

As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:

	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
Student Activities (SA)	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 206 Course Name: Applied Differential Equations 3 CH

Prerequisites

Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		2		-	
Required SWL	-		Equivalent ECTS	-	

Course Content

The topics covered existence and uniqueness theorem, Picard method of solution of systems of differential equations, classes of non-linear ordinary differential equations and solution methods, systems of differential equations, qualitative analysis of systems of ordinary differential equations, classification of equilibrium points, linearization and eigenvalues method, and Lyapunov method.

Taught in Program(s)

As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Sta 202	Course Name: Principles of Sampling Theory		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	-	
Required SWL	-	Equivalent ECTS	-
Course Content			
Population, sampling, census survey, sample, sample statistics, probability sampling and non-probability sampling. Random samples, small samples and large samples, systematic sampling, estimation of population parameters, variance estimators and variance estimators, sample size determination, ratio and regression estimations, applications on samples, the relationship between different types of samples, applications.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	
Assessment Weights:					

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (S)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
-	-		-		-	

Course Code: Mat 208 Course Name: History of Mathematics			2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	-	
Required SWL	-	Equivalent ECTS	-
Course Content			
Ancient Egyptian and Babylonian mathematics, early Chinese and Indian mathematics. Mathematics in Ancient Greece and in the Hellenistic world. Mathematics of the early Islamic Culture. Medieval European mathematics. Renaissance mathematics. Mathematics and Science in the 17th–18th Century. Mathematics, Applied Mathematics and Mathematical Physics in the 19th Century. Mathematics of the 20th century.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (S)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
-	-		-		-	

Course Code: Mat 301	Course Name: Mathematical Logic	3 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	2	-
Required SWL	-	Equivalent ECTS	-
Course Content		
First-order logic: some properties of first-order theorems, deductive theorem, perfectionist theories, some additional meta-theorems, base C (free test operation), standard Brinks photograph. Formal number theory: a system of axioms, deduction, equality, substitution, addition, multiplication, ordering, formal arithmetic, Gödel's theorem.		

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Sta 301	Course Name: Statistical Quality Control	3 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	2	-
Required SWL	-	Equivalent ECTS	-
Course Content		
A comprehensive coverage of modern quality control techniques to include the design of statistical process control systems, acceptance sampling, and process improvement.		

Taught in Program(s)
As major in Program(s) Code(s)
Mat Program
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 305	Course Name: Decision Making Skills	3 CH
Prerequisites		

Number of weekly Contact Hours

Lecture	Tutorial	Laboratory
2	2	-

Required SWL	-	Equivalent ECTS	-

Course Content

Successful leaders consider all possibilities, opportunities and challenges when making decisions, often in the face of ambiguity and/or conflicting information. The ability to think critically and innovatively in this environment is a driver for growth and the key to effective decision making. In this course, learners will develop skills to think critically and innovatively about issues in their workplace. Learners will analyze their own thinking habits, the assumptions and biases that inform them, and the results. This course will support learners' capacity to make better decisions and think more creatively in order to create a resilient, robust, and agile organization that meets the ongoing demands.

Taught in Program(s)

As major in Program(s) Code(s)

Mat Program

As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:

	Midterm (MT)	Practical / Oral Exam (PE)	Final Exam (FE)

Student Activities (SA)	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (S)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
-	-		-		-	

Course Code: Mat 307	Course Name: Approximation Theory		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	-	
Required SWL	-	Equivalent ECTS	-
Course Content			
Basics: the problem of approximation, a general introduction to the problem of approximation, criteria L^p, Chebyshev criteria, Bolea's algorithm, theories of existence, least squares and orthogonal functions: least squares approximation, orthogonal functions, orthogonal functions on finite point sets, approximation on a period as the end of the approximation on a finite, orthogonal point set. Chebyshev approximation, distinguishing nearest approximations, unity, continuous dependence, approximation on finite subsets, delavalier-Poussin algorithm, state functions, rational functions, application limits of Chebyshev type theorems. Existence, Excellence, Oneness.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ GOAL 1: No Poverty	**□ GOAL 2: Zero Hunger**	**□ GOAL 3: Good Health and Well-being**	**□ GOAL 4: Quality Education**	**□ GOAL 5: Gender Equality**	**□ GOAL 6: Clean Water and Sanitation**
□ GOAL 7: Affordable and Clean Energy	**□ GOAL 8: Decent Work and Economic Growth**	**□ GOAL 9: Industry, Innovation and Infrastructure**	**□ GOAL 10: Reduced Inequality**	**□ GOAL 11: Sustainable Cities and Communities**	**□ GOAL 12: Responsible Consumption and Production**
□ GOAL 13: Climate Action	**□ GOAL 14: Life Below Water**	**□ GOAL 15: Life on Land**	**□ GOAL 16: Peace and Justice Strong Institutions**	**□ GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:					
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (S)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
-	-		-		-	

Course Code: Mat 303	Course Name: Optimization Techniques		3 CH
Prerequisites			

Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		2		-	
Required SWL	-		Equivalent ECTS	-	
Course Content					
Introduction to optimization techniques using both linear and non-linear programming. The focus of the course is on convex optimization though some techniques will be covered for non-convex function optimization too. After an adequate introduction to linear algebra and probability theory, students will learn to frame engineering minima maxima problems in the framework of optimization problems.					

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 304	Course Name: Multicriteria Decision Making		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	-	
Required SWL	-	Equivalent ECTS	-
Course Content			
Detection and formulation of multiple criteria problems; Multi-criteria decision-making (MCDM) is one of the most widely used decision methodologies in the sciences, business, government and engineering worlds. Classifying Multi Criteria Decision Making (MCDM) problems into two classes (1) multi attribute decision making (MADM), and (2) multi objective decision making (MODM). Methods for solving multiple criteria problems (Comparison, The level of satisfaction, Decision Tree Analysis, Outranking methods, Electra method, Promethean method, Analytic Hierarchy Process, Data Envelopment Analysis). Multicriteria Programming (Formulation of objectives and constraints, Criteria set, Efficient set, Ideal solution, Goal programming). Practical classes: The application of various software packages (Microsoft Excel, Lindo, Lingo, Visual Promethean) for solving practical problems in a field of multicriteria decision making.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	10		20		50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Sta 304	Course Name: Multivariate Data Analysis	3 CH
Prerequisites		

Number of weekly Contact Hours

Lecture	Tutorial	Laboratory
2	2	-

Required SWL	-	Equivalent ECTS	-

Course Content

The course covers the multivariate normal distribution, Hoteling's T2 test, multivariate analysis of variance (MANOVA), principal component analysis (PCA), factor analysis, models for regression analysis with collinear explanatory variables such as principal component regression (PCR) and PLS, analysis of data from experiments with repeated measurements, discriminant analysis and cluster analysis.

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:

	Midterm (MT)	Practical / Oral Exam (PE)	Final Exam (FE)

Student Activities (SA)	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	10		20		50	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (S)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
-	-		-		-	

Course Code: Sta 306	Course Name: Applied Optimization Methods		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	-	
Required SWL	-	Equivalent ECTS	-
Course Content			
Optimization is the process of obtaining the best result under given circumstances. In design, construction and maintenance of any engineering system, engineers have to take many technological and managerial decisions at several stages. The ultimate goal of all such decisions is either to minimize the effort required or to maximize the desired benefit. A number of optimization methods have been developed for solving different types of optimization problems. In this course, after discussing about the optimization problem formulation, Linear Programming, Non Linear Programming, Dynamic Programming techniques are explained in detail along with number of applications in civil engineering. Advanced optimization techniques such as Evolutionary search algorithms, Multi objective optimization are briefly introduced.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ GOAL 1: No Poverty	**□ GOAL 2: Zero Hunger**	**□ GOAL 3: Good Health and Well-being**	**□ GOAL 4: Quality Education**	**□ GOAL 5: Gender Equality**	**□ GOAL 6: Clean Water and Sanitation**
□ GOAL 7: Affordable and Clean Energy	**□ GOAL 8: Decent Work and Economic Growth**	**□ GOAL 9: Industry, Innovation and Infrastructure**	**□ GOAL 10: Reduced Inequality**	**□ GOAL 11: Sustainable Cities and Communities**	**□ GOAL 12: Responsible Consumption and Production**
□ GOAL 13: Climate Action	**□ GOAL 14: Life Below Water**	**□ GOAL 15: Life on Land**	**□ GOAL 16: Peace and Justice Strong Institutions**	**□ GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:					
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (S)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
-	-		-		-	

Course Code: Mat 306	Course Name: Topology (I)	3 CH
Prerequisites		

Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		2		-	
Required SWL	-		Equivalent ECTS	-	
Course Content					
Real line and plane topology. Topological spaces: topology, open class, closed class, adjacency, accumulation point, derived class, inner class, out class, limit, partial spaces, compare topologies, series and convergence, base, position base. Connection and symmetry- Continuous functions and homeomorphisms, local connection, sequential connection, open imaging, closed imaging, bicontact imaging, symmetries, topological properties. Counting axioms: countable spaces of the first and second types, discrete spaces. Separation axioms- homotopy equivalence – compact spaces- connected spaces – fundamental group.					

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	10		20		50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 302	Course Name: Technical Mathematics for Industry	3 CH
Prerequisites		

Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		2		-	
Required SWL	-		Equivalent ECTS	-	
Course Content					
Topics include measurement, algebra, geometry, trigonometry, graphs, and finance. These are presented at an introductory level and the emphasis is on applications. The math problems encountered in the real world tend to be messy problems for which textbook approaches are very tedious or simply will not work. During this course, in addition to the standard textbook techniques, we will show you how to leverage technology to solve the more general problems you may encounter in real world applications.					

Taught in Program(s)
As major in Program(s) Code(s)
Mat Program

As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	10		20		50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 328	Course Name: Special Course (1) Linear Algebra		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	-	
Required SWL	-	Equivalent ECTS	-
Course Content			
The course specifications done by the department councils.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Level (4)

Course Code: Mat 401 Course Name: Theoretical Aspects of Reasoning about Data(Rough Sets) 3 CH			
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	-	
Required SWL	-	Equivalent ECTS	-
Course Content			
To-date computers are supposed to store and exploit knowledge. At least that is one of the aims of research fields such as Artificial Intelligence and Information Systems. However, the problem is to understand what knowledge means, to find ways of representing knowledge, and to specify automated machineries that can extract useful information from stored knowledge. Knowledge is something people have in their mind, and which they can express through natural language. Knowledge is acquired not only from books, but also from observations made during experiments; in other words, from data. This course is devoted to some areas of research in Artificial Intelligence: knowledge, imprecision, vagueness, learning, induction and others. The course is composed of two parts, firstly the basic ideas underlying rough set theory and related subjects are given and the contents is organized according to the very natural mathematical structure of the material presented. Secondly contains some applications of the discussed ideas.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 402 Course Name: Topological Data Analysis 3 CH			
Prerequisites			
Number of weekly Contact Hours			

Lecture	Tutorial	Laboratory
2	2	-

Required SWL	-	Equivalent ECTS	-

Course Content

Basics Topology -Complexes on data – Homology- Topological persistence - General Persistence (Zigzag) - Generators and Optimality - Topology inference from point cloud data - Persistence on graphs and Reed graphs - Discrete Morse Theory and Persistence.

Taught in Program(s)

As major in Program(s) Code(s)

Mat Program

As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 409	Course Name: Field Training	3 CH

Prerequisites

Number of weekly Contact Hours

Lecture	Tutorial	Laboratory
2	2	-

Required SWL	-	Equivalent ECTS	-

Course Content

The course will emphasize the theories of management training and development, and the practical application of these theories in today's organizations. Special emphasis will be on current topics in the field of human resource development, including training self-directed work teams, managing a diverse workforce, and the practical application of designing programs in today's environment. This will include actually designing needs analysis and training evaluation programs. The course will frame the concept of training and development within the applicable theory of adult learning.

Taught in Program(s)

As major in Program(s) Code(s)

Mat Program

As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	□ Exam	□ Practical Exam	□ Oral Exam	□ Assessment	□ Exam
-	-		-		-	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
20	40	40	-

Course Code: Mat 403	Course Name: Mathematics for Solving Problems	2 CH
Prerequisites		

Number of weekly Contact Hours

Lecture	Tutorial	Laboratory
2	1	-

Required SWL	-	Equivalent ECTS	-

Course Content

The primary objective in this course is to prepare students with appropriate materials for the Problem Solving Techniques related to the solution of mathematical problems such as Numbers, Sets, Functions, Logic, Induction, Combinatory, Graph Theory, and Recurrence Relations. In this course students will: 1. Develop a thorough understanding of the mathematics content for Problem Solving and methods for the 2 solution of mathematical problems such as, Sets, Functions, Logic, Induction, Combinatory, Graph Theory, and Recurrence Relations. 2. Formulate explanations of that content in understandable terminology. 3. Develop greater facility to think about mathematics and mathematical problem solving.

Taught in Program(s)

As major in Program(s) Code(s)

Mat Program

As minor in Program(s) Code(s)

Targeted Sustainable Development Goals

□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:

Student Activities	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam

(SA)						
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 407 Course Name: Optimal Control 2 CH			
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	-	
Required SWL	-	Equivalent ECTS	-
Course Content			
Formulation of the optimal control problem. The Maximum Principle. Optimal feedback and the Hamilton-Jacobi-Bellman equation. Numerical methods for solving optimal control problems. Relations to MPC and convex optimization.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Sta 401 Course Name: Generalized Linear Models 2 CH			
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	1	-	
Required SWL	-	Equivalent ECTS	-
Course Content			
Components, exponential family, model fitting, frequent inference: analysis of deviance, stepwise selection,			

goodness of fit. Bayesian inference in GLMs (basics): priors, posterior, comparison with frequents approach, posterior computation, MCMC strategies (Gibbs, Metropolis Hastings). Binary & categorical response data: (a) Basics: link functions, form of posterior, approximations, Gibbs sampling via adaptive rejection (b) Latent variable models: Threshold formulations, probity models, discrete choice models, logistic regression & generalizations, data augmentation algorithms (Albert Chib + other forms) . Count data: Poisson & over-dispersed Poisson log-linear models, prior distributions, applications. Bayesian variable selection: problem formulation, mixture priors, stochastic search algorithms, examples, approximations. Bayesian hypothesis testing in GLMs: one- and two-sided alternatives, basic decision theoretic approaches, mixture priors, computation, order restricted inference. Survival analysis: censoring definitions, form of likelihood, parametric models, discrete-time & continuous time formulations, proportional hazards, priors for hazard functions, computation. Missing data: problem formulation, selection & pattern mixture models, shared variable approaches, examples. Multistate & stochastic modeling: motivating examples (epidemiologic studies with periodic observations of a disease process), discrete time approaches, joint models, computation 1.

Taught in Program(s)
As major in Program(s) Code(s)
Mat Program
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Sta 402	Course Name: Life and Validity Tests		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	-	
Required SWL	-	Equivalent ECTS	-
Course Content			
Introduction to monotonous statistics, validity measures, life distributions (Weibull distribution, Rayleigh distribution, gamma distribution, normal distribution). Validity of series connected systems, parallel systems, backup systems, controlled and uncontrolled samples.			

Taught in Program(s)
As major in Program(s) Code(s)
Mat Program

As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 424	Course Name: Graduation Project		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
-	-	2	
Required SWL	-	Equivalent ECTS	-

Course Content

The project of research and report, to develop students to use their scientific knowledge, their ability to plan and execute an extended experimental or theoretical investigation and use all their communication skills to describe their results. To provide an understanding of some techniques of research, including the presentation of results. Students should have obtained an appreciation of research methodologies gained under individual supervision; ability to design and execute a project, write a report and give a talk on it. The student chooses the project in consultation with a member of staff.

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ GOAL 1: No Poverty	□ GOAL 2: Zero Hunger	□ GOAL 3: Good Health and Well-being	□ GOAL 4: Quality Education	□ GOAL 5: Gender Equality	□ GOAL 6: Clean Water and Sanitation
□ GOAL 7: Affordable and Clean Energy	□ GOAL 8: Decent Work and Economic Growth	□ GOAL 9: Industry, Innovation and Infrastructure	□ GOAL 10: Reduced Inequality	□ GOAL 11: Sustainable Cities and Communities	□ GOAL 12: Responsible Consumption and Production
□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	
Assessment Weights:					

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	□ Exam	□ Practical Exam	□ Oral Exam	□ Assessment	□ Exam
-	-		-		-	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
60	20	20	-

Course Code: Mat 406 Course Name: Numerical Solutions of Integral Equations 3 CH			
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	2	-	
Required SWL	-	Equivalent ECTS	-
Course Content			
Numerical solutions of integral equations of Friedholm type: addition method, Young method, methods of expansion (Elliott, Scraton, Soldier, Galerkin). Numerical Solutions of Integral Equations of the Fredholm Infernal Integral Type: Contour Method, Accelerated Galerkin Method), Error Analysis. Numerical solutions of molecular integral equations using computer software.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 405 Course Name: Special Course (2) Numerical Analysis 3 CH

Prerequisites					
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		2		-	
Required SWL	-		Equivalent ECTS	-	
Course Content					
The course specifications done by the department councils.					

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**
□ **GOAL 13: Climate Action**	□ **GOAL 14: Life Below Water**	□ **GOAL 15: Life on Land**	□ **GOAL 16: Peace and Justice Strong Institutions**	□ **GOAL 17: Partnerships to achieve the Goal**	

Assessment Weights:						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Course Code: Mat 404 Course Name: Special Course (3) Mathematical Methods 3 CH					
Prerequisites					
Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
2		2		-	
Required SWL	-		Equivalent ECTS	-	
Course Content					
The course specifications done by the department councils.					

Taught in Program(s)					
As major in Program(s) Code(s)					
Mat Program					
As minor in Program(s) Code(s)					
Targeted Sustainable Development Goals					
□ **GOAL 1: No Poverty**	□ **GOAL 2: Zero Hunger**	□ **GOAL 3: Good Health and Well-being**	□ **GOAL 4: Quality Education**	□ **GOAL 5: Gender Equality**	□ **GOAL 6: Clean Water and Sanitation**
□ **GOAL 7: Affordable and Clean Energy**	□ **GOAL 8: Decent Work and Economic Growth**	□ **GOAL 9: Industry, Innovation and Infrastructure**	□ **GOAL 10: Reduced Inequality**	□ **GOAL 11: Sustainable Cities and Communities**	□ **GOAL 12: Responsible Consumption and Production**

□ GOAL 13: Climate Action	□ GOAL 14: Life Below Water	□ GOAL 15: Life on Land	□ GOAL 16: Peace and Justice Strong Institutions	□ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights:						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final Exam (FE)	
	□ Assessment	■ Exam	□ Practical Exam	■ Oral Exam	□ Assessment	■ Exam
20	20		10		50	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (S)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

محتوى المقررات الاختياريه والاجباريه لمتطلب الجامعه

مقررات المستوى الأول (الاجباريه)

Uni 107: Social issues - 2 Credit (Lecture 2h/w) القضايا المجتمعية

المحتوى: يتكون هذا المقرر من بابين الأول اجباري ويحتوي على اربعه فصول كلاتي:

الفصل الأول: المشكلات المترتبه على الزياده السكانية واثرها على الصحه الإنجابية.

الفصل الثاني : حقوق الانسان

الفصل الثالث: الشفافيه ومكافحة الفساد.

الفصل الرابع: سماحة الأديان واداب الحوار مع الاخر.

والباب الثاني اختياري ويتكون من فصليت:

الفصل الخامس: التربيه الاعلاميه الرقمية

الفصل السادس: يحدده مجلس الكلية.

المراجع:

القضايا المجتمعية -ا.د السيد محمد دعدور - رئيس جامعة دمياط.

Uni 108: English for science -2 Credit (Lecture 2h/w) اللغه الانجليزية

Contents: Coverage of selected scientific terminology, with the objective of familiarizing the students with the English terms and their Arabic counter parts, focusing on the spelling and pronunciation of these terms. Coverage of some areas in traditional English grammar, particularly

those problematic for the students at this stage.

References:

Ann Raimes. (1999): Keys for Writers: A Brief Handbook, 2nd ed., New York: Houghton Mifflin Company.

Enani, M.M. (1996): Essay Writing. Cairo: Cairo University Press.

John and Liz, S. (1996): Headway: Pre-intermediate level, Oxford University Press.

Uni 109: Information Technology - 2 Credit (Lecture 2h/w) تكنولوجيا المعلومات

Contents: The syllabus consists of five major modules: 1- Information Systems: To give

students a broad foundation of basic computing/data is processing knowledge and skills. 2: Human communication and Business Organization: To provide students with the necessary written and verbal communication skills to enable them to relate to others on computing and non-computing matters- To give the student an understanding of the information needs of organizations, the various types of organization and the various ways that Information- Technology permeates within organizations. 3: Software: To become familiar with the various types of software categories and their capabilities- Students will develop skills to use generic software especially of database and spreadsheet nature. 4: Programming Techniques and System Development: To give students knowledge of the necessary techniques needed to implement algorithmic design using a high-level language, which is object oriented (Java), as well as creating, testing and maintaining the implemented systems. (A working knowledge of a high level programming language at SEC level is recommended.) 5: Exercises: To give students the opportunity to put into practice concepts learnt during the course.

References:

Ralph M. Stair and George W. Reynolds: "Principles of Information Systems", 2018

المستوى الثاني (الاختياريه)

Uni 209: Innovation and entrepreneurship - 2 Credit التغيرات المناخية

المحتوى: توصيف المبادئ الأساسية للتغيرات المناخية .التعرف على التغيرات المناخية التي حدثت في الماضي. تحديد المؤشرات الدالة على حدوث التغيرات المناخية .شرح تأثيرات التغيرات المناخية على الأنظمة الطبيعية الموجودة في كل من اليابسة والمحيطات والغلاف الحيوى.

المراجع

Change, I. P. O. C. (2007). Climate change 2007: The physical science basis. *Agenda*, *6*(07), 333.

Uni 211: History of Ancient Egypt - 2 Credit تاريخ مصر القديم

دراسة تاريخ مصر منذ عصر ما قبل الكتابة حتى نهاية العصر القديم، والمصادر التى يستقى منها المادة العلمية وطبيعتها، وأصل المصريين، فترة ما قبل الأسرات، والدولة القديمة و الانتقال الاول، والدولة الوسطى والانتقال الثانى، والدولة الحديثة. عصر الأسرات المتأخرة حتى الفتح المقدونى، والنظام السياسى والادارى فى مصر، ومظاهر الحضارة المصرية، وحالة مصر الاقتصادية والاجتماعية، والديانة المصرية القديمة.

Uni 212: Psychology and Sociology - 2 Credit علم النفس والاجتماع

تعريف غير المتخصصين فى علم النفس بمدى الاستفادة منه فى تفسير بعض الظواهر الفلسفية، والتعريف بطبيعة علم النفس وأهم أهدافه ومجالاته. دراسة بعض العمليات العقلية العليا كالانتباه والادراك، والتعلم والتذكر، ودراسة الشخصية الانسانيه، ودراسة الانفعالات. استيعاب أهم المفاهيم والنظريات ذات الصلة بموضوعات علم النفس الاجتماعى، وفهم أسس التفاعل الاجتماعى بين الافراد، والوقوف على محدداته وآثاره، وتوظيف المعرفة فى مجال علم النفس الاجتماعى فى المجالات التطبيقية، وتنمية مهارات البحث المكتبى والميدانى المتصلة بموضوعات المادة. دراسة موضوع علم الاجتماع، وأهم المصطلحات السوسيولوجية، ومناهج البحث فى علم الاجتماع، والتنمية البشرية، والثقافة. دراسة الفروع السوسيولوجية: علم اجتماع التنمية، وعلم الاجتماع الريفى وعلم الاجتماع الطبى.

Uni 213: History and Philosophy of Science - 2 Credit تاريخ وفلسفة العلوم

التعرف على تاريخ العلم فى الحضارة الاسلامية، والتعرف على دور العرب فى تطوير العلم، واستكمال الوعى بمكونات هويتنا الحضارية. دراسة ماهية العلم العربى، والاطار الحضارى للعلم العربى، والاسس المنهجية لدراسة العلم العربى، وترجمة التراث الاجنبى إلى اللغة العربية. أهم العلماء)جابر بن حيان – والرازى – وابن سينا – وابن الهيثم(. دراسة مدخل إلى فلسفة العلم)الفلسفة، والفلسفة العلمية، وفلسفة العلم(، ودلالات العلم) البحث والتطبيق، والمنهج والمحتوى المعرفى، والعلم واللاعلم(. العلم فى المجتمع والتاريخ.

Uni 214 : Ethics of Scientific Research-2 Credit أخلاقيات البحث العلمى

المبادئ الاساسيه لاخلاقيات البحث العلمى. شروط البحث العلمى. المعاٌيير المنهجية للبحث العلمى. حقوق الملكية الفكرية. التشريعات المصرية فى مجال حماية حقوق الملكية الفكرية. اليات نشر وتطبيق اخلاقيات البحث العلمى. اخلاقيات الاقتباس.

Uni 215: Laboratory Safety - 2 Credit الامان المعملى

مصادر الخطوره في المختبرات (المخاطر الطبيعيه – المخاطر الكيميائيه- الأشعه- المخاطر البيولوجيه) السلامه والوقايه الشخصيه الاسعافات الاوليه وترتيبات المعمل التخلص من النفايات المعمليه ، السلامه في الدراسات الحقليه.

Uni 216: Skills of Scientific Research - 2 Creditمهارات البحث العلمى

مفهوم البحث العلمى، اسس البحث العلمى، مناهج البحث العلمى، أنواع البحث العلمى، صفات الباحث المتميز، مهارات البحث العلمى، خطوات البحث العلمى، تحديد الهدف من البحث، اختيار الموضوع والقراءة حوله، تحرير عنوان البحث، وضع الخطة

المنهجيه للبحث واعتمادها من جهات الاختصا ص وأصول الاقتباس والترجمة.

Uni 210: Innovation and entrepreneurship - 2 Credit الابتكار وريادة الاعمال

Contents: This course deals with the study of leadership behaviour and its importance in building the personality in the institutions and society and knowing the relationship between the leadership and innovation. It also includes a detailed discussion of the personal characteristics of innovators, factors of innovation success and developing the administrative processes, knowing the criteria for building and developing the innovative behavior and practical cases and applications in leadership and management of innovation.

References:

Vaccaro, I. G., Jansen, J. J., Van Den Bosch, F. A., & Volberda, H. W. (2012). Management innovation and leadership: The moderating role of organizational size. *Journal of management studies*, *49*(1), 28-51.

Uni 218: History of Modern Egypt - 2 Credit تاريخ مصر الحديث

معرفة أوضاع المجتمع المصرى فى العصر العثمانى، والحملة الفرنسية وآثارها المختلفة على الصعيدين الخارجى والداخلى.

مشروع التحديث فى عصر محمد على، وموقف القوى الخارجية من ازدياد النفوذ الاجنبى فى مصر، والاحتلال البريطانى لها. دراسة المجتمع المصرى فى العصر العثمانى، والحملة الفرنسية والمجتمع المصرى .الفوضى السياسية فى مطلع القرن19 ،ومحمد على وتجربة التحديث. مظاهر النفوذ الاجنبى فى مصر فى النصف الثانى من القرن 19 ،والثورة العرابّية والاحتلال البريطاني.

Uni 219: Environmental Culture - 2 Credit الثقافة البيئية

الاطلاع على أحوال البيئة العالمية، والتعرف على المتغيرات البيئيه الاساسيه، والتعرف على مظاهر التلوث وأنماطه، والتوجيه إلى حماية البيئة فى الاغلفه الاربعة، و بيان السبب فى دراسة البيئة.

Uni 220: Philosophy and Critical Thinking - 2 Credit الفلسفة والتفكير النقدي

يحدد موضع التفكير النقدي بين صور التفكير الانساني ومستويات هو أنماطه المختلفة- .يعرف ماهية التفكير النقدي ومهاراته المختلفة- .يكتشف الاخطاء الشائعة في التفكير - يميز بين أنماط التفكير الصحيحة وغير الصحيحة- .يطبق مهارات التفكير النقدي في المواقف الحياتية المختلفة- .يوظف التفكير النقدي والمنطقي في حل المشكلات، واتخاذ القرارات المتنوعة- يّبني الحجج المنطقية، ويفسرها، ويقيمها- .يكتشف مدى صدق وصحة الحجج، وجوانب القوة والضعف فيها- .يحلل الحجج الاستنباطّية والاستقرائيه وينتقدها.

Uni 221: Communication Skills - 2 Credit مهارات التواصل

يقدم المقرر مهارات أساسية في الكتابة والتواصل الشخصي مع الآخرين للأغراض العلمية والعملية مما يمكّن الطالب من تقديم ذاته والتعبير بشكل فعال عما يريد إيصاله من معلومات وأفكار وكذلك التعامل مع المعلومات التي يقدمها الغير. - فهم معنى السيرة الذاتية

ومعرفة دورها وأهميتها وكيفية توظيفها للتقدم إلى فرصة ما. - معرفة دور رسالة الإرفاق وتكاملها مع السيرة الذاتية، والاستعداد للمقابلة الشخصية. - فهم معنى الاستطلاع أو المسح الاستبياني ومعرفة دوره وأهميته وكيفية توظيف نتائجه. - تصميم الاستبيان وإجراء المسح الاستبياني وتفريغ نتائجه. - معرفة معنى البحث العلمي وكيفية إجرائه. - كيفية تقديم نتائج البحث العلمي في تقرير احترافي. - معرفة أنواع التواصل المباشر وفهم معنى المحاضرة وخصوصيتها. - تصميم مادة محاضرة ومعرفة كيفية إلقائها والاستعداد لذلك وإدارة النقاش خلالها.

Uni 222: Fitness - 2 Credit **الصحة واللياقة**

يركز مقرر الصحه واللياقه على الجانب المتعلق بمهارات تطوير الذات من الناحية الصحية والجسدية، وما يرتبط بها من مهارات تتعلق
بالصحة الشخصية والغذائية والرياضية والوقائية والنفسية والإنجابية والإسعافات الأولية، مع التركيز على المواقف الحياتية، بهدف إثارة دافعية الطلاب وتشويقهم
لعملية التعلم من خلال الإطار العام للمقرر ومعاييره وضوابطه. أما عن وصف اللياقة البدنية فيتمثل دورها بممارسة التمرينات البدنية للمحافظه على الصحة باستخدام
الأجهزة الحديثة والتعلم بالترفيه وممارسة بعض الأنشطة الرياضية .

Uni 223: Biodiversity Conservation and Sustainability - 2 Credit

التنوع الحيوي والتنمية المستدامة

Introduce students in an integrative manner to the field of biodiversity conservation and how to apply its principles to best promote sustainability. Understanding biodiversity and its management requires an interdisciplinary approach with particular reference to mechanisms of change and human impacts on the environment. This course will be interdisciplinary in its approach.

Uni 224: Political Science and International Relations - 2 Credit

العلوم السياسية والعلاقات الدولية

تتناول هذه المادة ماهية و مفاهيم، علم العلاقات الدولية والذي يعد المجتمع الدولي مادته، وعلاقة علم العلاقات الدولية بباقي العلوم الاجتماعية الأخرى، وصولاً لتحديد ماهية الشخص الدولي كمدخل للوقوف على تعدد أشخاص هذا المجتمع، وتفسيرهم من خلال مجموعة معايير ذات الدلالة بقصد تحديد مكانة ودور كل منهم على الساحة وأطراف العلاقات الدولية و المناهج المعاصرة في دراسة العلاقات الدولية بالإضافة الى مدارس العلاقات السياسية الدولية كما يتم تناول مبادئ العلاقات الدولية والعوامل المؤثرة فيها و تطور العلاقات الدولية بين الحربين العالميتين خلال الحرب العالمية الثانية و العلاقات السياسية الدولية في عصر الامم المتحدة وفي ظل الحرب الباردة وانعكاساتها على العلاقات السياسية الدولية بالإضافة للعلاقات الدولية في ظل العولمة.

ثانيا: برامج قسم الجيولوجيا

برامج قسم الجيولوجيا

1- برنامج جيولوجيا الثروات المعدنية والبترول

(برنامج منفرد بمصروفات)

برنامج جيولوجيا الثروات المعدنية والبترول (المستوى الأول)

First Level - Courses of Mineral Resources and Petroleum Geology program

Semester	Course code	Course name	Prerequisites	Course name	Hours				Grades					
					Theoretical	Practical	Exercises	Credit Hours	Midterm	Ongoing evaluation	Oral exam	Practical exam	Final exam	Total
	Compulsory Courses (11 Credit Hours)													
First	Geo 101	Physical and Historical Geology	-		2	2	-	3	10	10	10	20	50	100
	Chm103G	Basics of General Chemistry I	-		2	2	-	3	10	10	10	20	50	100
	Phy 103	General Physics (1)	-		2	2	-	3	10	10	10	20	50	100
	Zoo 101	General Zoology	-		1	2	-	2	10	10	10	20	50	100
	Mat 101	General Mathematics	-		2	-	-	2	20	20	10	-	50	100
	Uni 109	Information Technology	-		2	-	-	2	20	10	10	-	60	100
	Uni 107	Societal issues	-		2	-	-	-	-	-	-	-	-	-
Total							17							600
Second	Geo 102	Minerals and Rocks	Geo 101	معادن وصخور	2	2	-	3	10	10	10	20	50	100
	Geo 104	Crystallography	-	علم البلورات	2	2	-	3	10	10	10	20	50	100
	Chm104G	Basics of General Chemistry II	Chm 103G	اساسيات الكيمياء العامة 2	2	2	-	3	10	10	10	20	50	100
	Bot 102	General Botany	-	نبات عام	1	2	-	2	10	10	10	20	50	100
	Phy 104	General Physics (2)	Phy 103	فيزياء عامة 2	1	2	-	2	10	10	10	20	50	100
	Com 104	Computer fundamentals	-	مبادى الحاسب الالى	1	2	-	2	10	10	10	20	50	100
	Uni 108	English for Science	-	لغة انجليزية للعلوم	2	-	-	2	20	10	10	-	60	100
Total					17									700
Total of both semesters					34								1300	

برنامج جيولوجيا الثروات المعدنية والبترول (المستوى الثانى)

Second Level (Sophomore year) - Courses of Mineral Resources and Petroleum Geology program

Semester	Course code	Course name		Prerequisites	Hours				Grades					
					Theoretical	Practical	Exercises	Credit Hours	Midterm	Ongoing evaluation	Oral exam	Practical exam	Final exam	Total
	Compulsory Courses (11 Credit Hours)													
First	Geo 201	Petroleum Geology	جيولوجيا البترول	-	2	2	-	3	10	10	10	20	50	100
	Geo 203	Petrogenesis of Rocks	نشأة الصخور	Geo 102	1	2	-	2	10	10	10	20	50	100
	Geo 205	Structural Geology and analysis	جيولوجيا تركيبية وتحليل التراكيب	Geo 101	2	2	-	3	10	10	10	20	50	100
	Geo 207	Plane Survey and field geology	مساحة وجيولوجيا الحقل	Geo 101	2	2	-	3	10	10	10	20	50	100
	Optional Courses(students should choose 6 credit Hours including 2 hrs. of university requirements)													
	Geo 209	Petroleum Provinces of Egypt	أقاليم البترول فى مصر	Geo 201	2	-	-	2	20	10	10	-	60	100
	Geo 211	Invertebrate Paleontology	حفريات لافقارية	-	1	2	-	2	10	10	10	20	50	100
	Geo 213	Hydrogeology	جيولوجيا المياه		1	2		2	10	10	10	20	50	10
	Geo 215	Ore Deposits in Africa	رواسب الخامات في افريقيا	Geo 102	1	2	-	2	10	10	10	20	50	100
	Geo 217	fundamentals of geophysics	أسس الجيوفيزياء		1	2		2	10	10	10	20	50	10
	Uni 209	University requirement	متطلب جامعة	-	2	-	-	2	20	10	10	-	60	100
Total								17						700
	Compulsory Courses (11 Credit Hours)													
Second	Geo 202	Petroleum Systems	أنظمة البترول	Geo 201	2	2	-	3	10	10	10	20	50	100
	Geo 204	Well Logging	تسجيلات الأبار	-	1	2	-	2	10	10	10	20	50	100
	Geo 206	Geochemistry	أسس الجيوكيمياء	-	2	2	-	3	10	10	10	20	50	100
	Geo 208	Mining Geology	جيولوجيا منجميه	Geo 102	2	2	-	3	10	10	10	20	50	100
	Optional Courses (students should choose 6 credit Hours including 2 hrs. of university requirements)													
	Geo 210	Photogeology and Remote Sensing	استشعار من بعد وجيولوجيا تصويرية	-	1	2	-	2	10	10	10	20	50	100
	Geo 212	Petroleum Provinces in Africa	أقاليم البترول فى افريقيا	Geo 201	2	-	-	2	20	10	10	-	60	100
	Geo 214	Use of minerals in industry	استخدام المعادن في الصناعة	Geo 102	1	2	-	2	10	10	10	20	50	100
	Geo 216	Risk Assessment and Safety in Petroleum Fields	تقييم المخاطر والسلامة فى حقول البترول	-	2	-	-	2	20	10	10	-	60	100
	Chm298G	Chemistry of Ore Analysis	كيمياء تحليل الخامات	Chm104G	1	2	-	2	20	20	10	-	50	100
	Uni 210	University requirement	متطلب جامعة	-	2	-	-	2	20	10	10	-	60	100
Total								17						700
Total of both semesters								34						1400

برنامج جيولوجيا الثروات المعدنية والبترول (المستوى الثالث)

Third Level (Junior year) - Courses of Mineral Resources and Petroleum Geology program

Semester	Course code	Course name		Prerequisites	Hours				Grades					
					Theoretical	Practical	Exercises	Credit Hours	Midterm	Ongoing evaluation	Oral exam	Practical exam	Final exam	Total
		Compulsory Courses (11 Credit Hours)												
First	Geo 301	Mineral Economics	اقتصاديات المعادن	Geo 203	2	2	-	3	10	10	10	20	50	100
	Geo 311	Ore Microscopy	ميكروسكوبية الخامات	Geo 215	2	2	-	3	10	10	10	20	50	100
	Geo 321	Geochemistry of Hydrocarbons	جيوكيمياء الهيدروكربونات	Geo 201	2	2	-	3	10	10	10	20	50	100
	Geo 307	Petroleum Geophysical Prospection	التنقيب الجيوفيزيائى للبترول	Geo 201	1	2	-	2	10	10	10	20	50	100
		Optional Courses(students should choose 6 credit Hours)												
	Geo 309	Isotope Geology	جيولوجيا النظائر	-	2	-	-	2	20	10	10	-	60	100
	Chm 399G	Petroleum Chemistry	كيمياء البترول	Chm298 G	1	2	-	2	10	10	10	20	50	100
	Geo 313	Quaternary Geology	جيولوجيا عصر الرباعى	-	1	2	-	2	10	10	10	20	50	100
	Com 391	Introduction of Python Language	مقدمة فى لغة البرمجة (البايثون)	Com 104	1	2	-	2	10	10	10	20	50	100
	Geo 315	Mineral Resources in Egypt	الرواسب المعدنية في مصر	-	1	2	-	2	10	10	10	20	50	100
Total								17						700
	Compulsory Courses (11 Credit Hours)													
Second	Geo 302	Geochemical techniques	تقنيات جيوكيميائية	Geo 321	2	2	-	3	10	10	10	20	50	100
	Geo 304	Mineral Exploration	استكشاف معدنى	-	2	2	-	3	10	10	10	20	50	100
	Geo 306	Stratigraphy	علم الطبقات	-	1	2	-	2	10	10	10	20	50	100
	Geo 308	Micropaleontology	حفريات دقيقة	-	2	2	-	3	10	10	10	20	50	100
	Optional Courses(students should choose 6 credit Hours)													
	Geo 310	Wells drilling and developments	حفر وتنمية الأبـــــار	Geo 307	1	2	-	2	10	10	10	20	50	100
	Geo 312	Petroleum industry	صناعة البـــــترول	-	1	2	-	2	10	10	10	20	50	100
	Geo 314	Minerals Processing Techniques	تكنولوجيا إستخراج المعادن	-	1	2	-	2	10	10	10	20	50	100
	Geo 316	Palynology	حفريات نباتية	-	1	2	-	2	10	10	10	20	50	1
	Geo 318	Geographic Information System in Geology	نظم معلومات جغرافية فى الجيولوجيا	-	1	2	-	2	10	10	10	20	50	1
	Geo 320	Sedimentary Basins Modeling	نمذجة أحواض ترسيب	-	1	2	-	2	10	10	10	20	50	1
Total								17						700
Total of both semesters								34						1400

-

برنامج جيولوجيا الثروات المعدنية والبترول (المستوى الرابع)

Fourth Level (Senior year) - Courses of Mineral Resources and Petroleum Geology program

Semester	Course code	Course name		Prerequisites	Hours				Grades					
					Theoretical	Practical	Exercises	Credit Hours	Midterm	Ongoing evaluation	Oral exam	Practical exam	Final exam	Total
Compulsory Courses (13 Credit Hours)														
First	Geo 401	Mine Geology and Quarries	جيولوجيا المناجم والمحاجر	-	1	2	-	2	10	10	10	20	50	100
	Geo 403	Subsurface Geology	جيولوجيا تحت سطحية	Geo 306	2	2	-	3	10	10	10	20	50	100
	Geo 405	Industrial Minerals and Rocks	معادن وصخور صناعية	Geo 315-	2	2	-	3	10	10	10	20	50	100
	Geo 407	Oil and natural gas refining	علم تكرير البترول والغاز الطبيعى	-	1	2	-	2	10	10	10	20	50	100
	Geo 400	Scientific Research Course	مقرر البحث العلمي						Continuous					
	Geo 499	Field Training	تدريب حقلى	-	-	-	-	3	20 % report + 20 % supervision + 60 % discussion					100
			Optional Courses(students should choose 4 credit)											
	Geo 409	Environmental impact of mining and petroleum operations	التأثير البيئى لعمليات التعدين والبترول	-	2	-	-	2	20	10	10	-	60	100
	Geo 411	Radioactive Minerals	معادن مشعة	-	1	2	-	2	10	10	10	20	50	100
	Geo 413	Petroleum Engineering	هندسة البترول	-	1	2	-	2	10	10	10	20	50	100
			Total				17							700
			Compulsory Courses (12 Credit Hours)											
Second	Geo 402	Geology of Egypt	جيولوجيا مصر	-	2	2	-	3	10	10	10	20	50	100
	Geo 404	Geochemistry of crystalline rocks	جيوكيمياء الصخور المتبلورة	Geo 321	1	2	-	2	10	10	10	20	50	100
	Geo 406	Modelling of Petroleum Reservoir	معالجة خزانات البترول	-	1	2	-	2	10	10	10	20	50	100
	Geo 408	Mineral Resources in Egypt	الثروات المعدنية فى مصر	Geo 311	1	2	-	2	10	10	10	20	50	100
	Geo 400	Scientific Research Course	مقرر البحث العلمي	-	-	-	-	3	40 report, 40 supervision, 20 discussion					100
			Optional Courses(students should choose 6 Hours)											
	Geo 410	Well and drilling technology	تكنولوجيا الأبار والحفر	-	2	-	-	2	20	10	10	-	60	100
	Geo 412	Economic evaluation of petroleum and minerals	تقييم اقتصاديات البترول والمعادن	-	1	2	-	2	10	10	10	20	50	100
	Geo 414	Biostratigraphy and Paleoenvironment	طبقية وبيئة احياء قديمة	-	1	2	-	2	10	10	10	20	50	100
	Geo 416	Environmental Geophysics	الجيوفيزياء البيئية		1	2	-	2	10	10	10	20	50	100
	Sta 492	Geostatic	احصاء جيولوجى	-	2	-	-	2	20	10	10	-	60	100
		Total					18							800
		Total of both semesters					35							1500

قسم الجيولوجيا

المحتوى العلمي لمقررات برنامج جيولوجيا الثروات المعدنية والبترول

(برنامج منفرد بمصروفات)

المحتوى العلمى لمقررات
برنامج جيولوجيا الثروات المعدنية والبترول

Course's Contents of Mineral Resources and Petroleum Geology

First Level - Courses of Mineral Resources and Petroleum Geology program

نموذج شرح جدول المواصفات الأساسية المقترح للمقرر

Physical and Historical Geology

Geo 101	Physical and Historical Geology			3 CH
Prerequisites	-			
Number of weekly Contact Hours				
Lecture	Tutorial	Laboratory		
2	-	2		
Required SWL	-	Equivalent ECTS	-	
Course Content				
Introduction to geology, minerals and rock, weathering, running water and underground water, glaciers, desert and winds, earthquakes and earth's interior, plate tectonics and crustal deformation, the ocean floor and its evolution, planetary geology, an introduction to environmental geology. History of the earth, the geological record, radioactivity and radioactive dating, the geologic time scale, the standard geologic column, the Proterozoic revolution, Younger Proterozoic, the Paleozoic, the Mesozoic, the Cenozoic, the human habitat.				

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

نموذج شرح جدول المواصفات الأساسية المقترح للمقرر

Basics of General Chemistry (I)

Chm 103G	Basics of General Chemistry (I)	3 CH
Prerequisites	-	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

The history of atomic theory-Different Atomic models- Thomson Model of Atom- Bohr Model of the Atom- Rutherford's Nuclear Model of Atom- - Electron Discovered- Protons & Nucleus Discovered- Electron's Charge Measured- Quantum Model of the Atom- Quantum number- Modern Atomic Theory- Schrodinger's atomic Model (The Cloud Model)- de Broglie (Dual Behaviour of Matter)- Heisenberg's Uncertainty Principle- Quantum Mechanical model of atom (Schrodinger's equation)- Shapes of Atomic Orbitals- Filling of Orbitals in Atom- Aufbau Principle-Hond rules- Periodic table-Periodic table properties- ionization energy-electronegative force-electron affinity- oxidation and reduction state- types of bonds -hybridization.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)		
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☒ Exam	
40%	20%		10%		30%		

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

نموذج شرح جدول المواصفات الأساسية المقترح للمقرر

General Physics for Geology (1)

Phy 103	General Physics for Geology (1)	3 CH
Prerequisites	-	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Electricity and Magnetism: Electric charge, Types of Charging, and Coulomb's law, The Electric Field, Electric Flux ,Gauss Law, Electric Potential, Capacitors and Capacitance, Combination of capacitors, Current and Resistance, Ohm's Law, Combination of Resistors, Electrical Energy and Power, Kirchhoff's Rules, The Magnetic Field, Force on an Electric Charge Moving in a Magnetic

Field, Ampere's Law Properties of Matter: Measurement (The physical quantities, Units and standards of units, The international system of unit, Standard of time, Standard of mass ,Standard of length, Dimensional analysis), Vectors (Vector and scalar quantities, Components of vectors, Adding vectors, Multiplying vectors, Scalar product, Vector product), Properties of Matter (Elasticity and fluid mechanics), Fluid statics (Pressure and density, Fluid at rest, Variation of pressure with the height in static fluid, Pascal's principle, Archimedes principle, Pressure measurements, Surface tension), Fluid Dynamics.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)		
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☒ Exam	
40%	20%		10%		30%		

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

نموذج شرح جدول المواصفات الأساسية المقترح للمقرر

General Zoology

Zoo 101	General Zoology		2 CH
Prerequisites	-		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
1	-	2	
Required SWL	-	Equivalent ECTS	-
Course Content			
Introduction in Cytology - Cell components and ultra-structure of the animal cell - cell division (mitosis and meiosis) – introduction of tissues types – introduction to the basis of taxonomy- General characters of kingdom and their major phyla and classes.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	
Assessment Weights					

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☒ Exam
40%	20%		10%		30%	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
10%	0%		20%		10%	

نموذج شرح جدول المواصفات الأساسية المقترح للمقرر

General Mathematics I

Mat 101	General Mathematics I			3 CH
Prerequisites	-			
Number of weekly Contact Hours				
Lecture	Tutorial	Laboratory		
2	-	2		
Required SWL	-	Equivalent ECTS	-	
Course Content				
Preliminaries the real number system, Inequalities, Absolute values, The rectangular coordinate system, The straight line. Functions and limits: Functions and their graphs, Operations on functions, the trigonometric functions, Limit of functions, Continuity of functions. The derivative: Definition of derivative rules for finding derivative, Derivatives of trigonometric functions, the chain rule, Derivatives of exponential and logarithm functions, Higher-order derivatives. Applications of the derivatives: Maxima and minima, the mean theorem. Integral: Antiderivatives (Indefinite integrals), the definite integral, Applications of the definite integral.				

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☒ Exam
40%	20%		10%		30%	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
10%	0%		20%		10%	

نموذج شرح جدول المواصفات الأساسية المقترح للمقرر

Minerals and Rocks

Geo 102	Minerals and Rocks		3 CH
Prerequisites	-		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	

Required SWL	-	Equivalent ECTS	-
Course Content			
Physical properties of minerals, chemical properties, identification and descriptive mineralogy, optical mineralogy, structural mineralogy, rock-forming minerals (silicates, accessory minerals and non-silicate minerals), introduction to Igneous rocks, Sedimentary rocks, and Metamorphic rocks.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

نموذج شرح جدول المواصفات الأساسية المقترح للمقرر

Crystallography

Geo 104	Crystallography	3 CH
Prerequisites	-	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-
Course Content			
Crystalline State Crystal Parts, Law of Constancy of Interfacial Angles, Crystal Aggregates, Crystal Twin, Zones, Crystal Form, Crystal Habit, Crystal Symmetry, Crystallographic Axes, The Seven Crystal Systems, Axial Ratios, Parameters & Indices, Classification & Nomenclature of Crystal Forms, The Holosymmetric Classes of the Seven Crystal Systems.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights			
Student	Midterm (MT)	Practical / Oral Exam (PE)	Final (FE)

Activities (SA)	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

نموذج شرح جدول المواصفات الأساسية المقترح للمقرر

Basics of General Chemistry (II)

Chm 104G	Basics of General Chemistry (II)	3 CH
Prerequisites	-	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Synthesis of Alkane - Alkene - Alkyne and its reaction- Synthesis of aliphatic alcohols and its reaction- Synthesis of aliphatic aldehyde, ketone, and its reaction- Synthesis of aliphatic carboxylic acid and its reaction- Synthesis of alkyl halide and its reaction- Synthesis of aliphatic amine (primary, secondary, tertiary) and its reaction- Synthesis of oxime and its reaction- Synthesis of ester and ether and its reaction.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

نموذج شرح جدول المواصفات الأساسية المقترح للمقرر

General Botany for Geology

Bot 102	General Botany for Geology	3 CH
Prerequisites	-	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Plant Kingdom: Plant Classification System, Viruses, Bacteria, Cyanobacteria, Algae, Fungi, Lichen, Embryophytes, Bryophyta, Pteridophyte, Gymnosperms, Angiosperm, General Characteristics and Life Cycle of Each Group.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

نموذج شرح جدول المواصفات الأساسية المقترح للمقرر

General Physics for Geology (2)

Phy 104	General Physics for Geology (2)	2 CH
Prerequisites	-	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Geometric Optics and Acoustics: Nature and propagation of light- hygens theory and its applications- Lenses and mirrors- optical instruments - Vision defects- introduction to wave optics- Sound waves- Sound transferring trough gases and solids- Doppler effect- Ultrasound waves and its measurements piezo effect. Heat and principles of thermodynamics: Heat- thermal equilibrium- measurement of temperature, temperature scales, kinetic theory of gases- Thermal expansion, Heat as a form of energy, Quantity of heat and specific heat- Thermal conductivity, Heat and work, Jul and Thomson phenomena.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

نموذج شرح جدول المواصفات الأساسية المقترح للمقرر

Computer Fundamentals

Com 104	Computer Fundamentals		2 CH
Prerequisites	-		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
1	-	2	
Required SWL	-	Equivalent ECTS	-
Course Content			

Introduction: Brief history of computing; the components of a computing system. Machine level representation of data: Bits, bytes, and words; numeric data representation and number bases; signed and twos-complement representations; fundamental operations on bits; representation of nonnumeric data. Digital logic: Switching circuits; gates; memory. Assembly level machine organization: Basic organization of the von Neumann machine; control unit; instruction fetch, decode, and execution; instruction sets and types; assembly/machine language programming; instruction formats. Hardware realizations of algorithms: Data representation; the von Neumann model of computation; the fetch/decode/execute cycle; basic machine organization. Operating systems and virtual machines: Historical evolution of operating systems; responsibilities of an operating system; basic components of an operating system. Computing applications: Word processing; spreadsheets; editors; files and directories. Introduction to net-centric computing: Background and history of networking and the Internet; demonstration and use of networking software including e-mail, telnet, and FTP.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)		
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☒ Exam	
40%	20%		10%		30%		

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Second Level (Sophomore year) - Courses of Mineral Resources and Petroleum Geology program

Geo 201	Petroleum Geology		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	

2	-	2

Required SWL		Equivalent ECTS	

Course Content

Forms, occurrences, origin, and formation of petroleum, source rock, kerogen types and generation potential, reservoir rock (types, classification, conditions, fluids), petroleum migration, roof rocks, petroleum traps, crude oils, evaluation of petroleum prospects, petroleum potentiality of Egypt, North Africa and Middle East.

Taught in Program(s)

As major in Program(s) Code(s)

Geology

As minor in Program(s) Code(s)

Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 203 Petrogenesis of Rocks 2 CH

Prerequisites

Number of weekly Contact Hours

Lecture	Tutorial	Laboratory
1	-	2

Required SWL		Equivalent ECTS	

Course Content

Igneous Rocks: Introduction, Recognition, Structures and classification of Igneous rocks; Magma genesis. Metamorphic Rocks: Definitions, agents and types of metamorphism; Structures, texture and Classification of metamorphic rocks; contact metamorphism; regional metamorphism; dynamic metamorphism. Sedimentary Rocks: Introduction, Structures and classification of Sedimentary Rocks; diageneses of Sedimentary Rocks.

Taught in Program(s)

As major in Program(s) Code(s)

Geology

As minor in Program(s) Code(s)

Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 205	Structural Geology and analysis	3 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL		Equivalent ECTS	

Course Content

Primary Structures: Diapers and Impact structures - Folds and Folding: Geometry, classification, systems, & mechanics - Brittle Failure and Joints: Origin and tectonic interpretation of joints - Faults and folds. Stereographic projection, foliation, joints, lineation, minor folds, deformation mechanism.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 207	Plane Survey and field geology	3 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL		Equivalent ECTS	

Course Content

Introduction to plane surveying - terms and definitions - survey methods - units and calculations used in plane surveying - devices and equipment - polygons - distance measurement – Chain Surving – Theodolite and Compass Traversing – Angles measurement - Levelling - Measurements of Areas and Volumes. :Field geology; Definitions& terminology - Equipments, surveying instruments and techniques - Sampling - Field characteristic of rock types – Field relations & Field Methods - Types of contacts –Geologic sections – Geologic mapping – Recognition and interpretation of the Geologic features - geologic report .

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology
Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 209	Petroleum Provinces of Egypt	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

The Gulf of Suez province - The oil fields of the Gulf of Suez - The Nile Delta Petroliferous province - The onshore fields of the Nile Delta - The offshore fields of the Nile Delta - The Western Desert petroliferous province – Structural evolution of the Western Desert - Tectonics of the Western Desert province - Sedimentary basins of the Western Desert - The Abu El Gharadig Basin – The Northern Sinai petroliferous province - The Northern Sinai offshore fields.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology
Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 211	Invertebrate Paleontology	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL		Equivalent ECTS	

Course Content

Mode and conditions of preservation of fossils, a review of life through ages. Morphology, classification and evolution

of Corals, Trilobites, Brachiopods, Lamellibranchs, Cephalopoda, Gastropods, Echinoids, Graptolites.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 213	**Hydrogeology 2**	**2 CH**
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL		Equivalent ECTS	

Course Content

Water distribution on Earth; Types of water meteoric, juvenile, magmatic and sea water; Hydrological Cycle and its components; Water balance; Water-bearing properties of rocks porosity, permeability, specific yield and specific retention; Vertical distribution of water; Zone of aeration and zone of saturation; Classification of rocks according to their water bearing properties; Aquifers; Classification of aquifers; Aquifer parameters, transmitivity and storage coefficient; Water table and piezometric surface; Fluctuations of water table and piezometric surface; Geologic and geomorphic controls on groundwater; Groundwater provinces of Egypt, Theory of groundwater flow; Darcy's law and its applications. Geologic and hydrogeologic methods of groundwater exploration; Role of remote sensing in groundwater exploration; Surface geophysical methods - seismic, gravity, geo-electrical and magnetic methods; Types of water wells and methods of construction; Design, development, maintenance and revitalization of wells; Sub-surface geophysical methods Physical and chemical properties of water; Quality criteria for different uses; Graphical presentation of groundwater quality data.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam

40%	20%	10%	30%
Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 215	**Ore Deposits in Africa**	**2 CH**

Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL		Equivalent ECTS	

Course Content

Principles of ore Deposits in Africa. Ore deposit geology and its influence on mineral exploration. Types of ore deposits and their origin in Africa. Geochemistry of Mineral Deposits. Classification of ore Deposits in Africa. Deposits related to mafic igneous rocks. Deposits related to oceanic crust. Deposits related to interstate to felsic intrusions. Deposits related to submarine volcanism and sedimentation in Africa.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
10%	0%		20%		10%	

Geo 217	**Fundamentals of Geophysics**	**2 CH**

Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL		Equivalent ECTS	

Course Content

Introduction to geophysics, Seismology: origin and form of seismic waves; seismic refraction/reflection; earth structure; earthquakes, Gravity: principles, practice and interpretation; isostasy, Magnetics: magnetisation; geomagnetism and palaeomagnetism; magnetic surveys, Geoelectric methods: principles of electrical and electromagnetic theory; electrical properties of Earth materials; SP, resistivity, EM, and GPR survey techniques, Geodesy: stress and strain; measurement and applications, Integrated case study.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 202	Petroleum Systems	3 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL		Equivalent ECTS	

Course Content

The petroleum system is a unifying concept that encompasses all of the disparate elements and processes of petroleum geology, including: the essential elements (source, reservoir, seal, and overburden rock) and processes (trap formation, generation-migration-accumulation) and all genetically related petroleum that originated from one pod of active source rock and occurs in shows, seeps, or accumulations also called hydrocarbon system.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 204	Well Logging	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL		Equivalent ECTS	

Course Content

Objectives, expectations, grading policy and road map, core data and coring operation - well logging applications -

Principles, tools, measurements, corrections and normalization of well log data - Graphical display of data - Temperature and caliper logs - Spontaneous potential (SP) andresistivity logging - Natural and spectral gamma ray logs - Density and Neutron logs - Sonic logging.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 206	**Geochemistry**		**3 CH**
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL		Equivalent ECTS	
Course Content			
Geochemistry of igneous rocks: Geochemistry of the Core, the Mantle, and the Crust- Physical and chemical methods of sample treatment - Chemical methods of analyses (conventional and new methods) - Distribution of elements in the different rock units -the relation between geochemistry, environmental and human health. Geochemistry of Sedimentary Rocks: Meteorites and geochemistry - Geochemical structure of the Earth - Geochemical classification of the elements -Geochemistry of REE - Chemical weathering and formation of sediments - Geochemical classification of sediments and of their derivatives - Geochemical factors controlling the distribution of trace elements in sediments - Geochemistry of biosphere – Geochemistry of Island Arcs, hot spots, MORR, the Moon, Mars – Isotopic applications in geochemistry.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights			
Student	Midterm (MT)	Practical / Oral Exam (PE)	Final (FE)

Activities (SA)	☐ Assessment	☒ Exam	☒ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 208	Mining Geology	3 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL		Equivalent ECTS	

Course Content

Mining Geology: Historical Perspective - Mineral deposits in the subsurface environment - Mineral deposits in the zone of weathering - Metallogenic processes and provinces - The engineering factors and approaches to Mining – Surface mining methods – Underground mining methods – Support of mining excavations and safety methods.

Taught in Program(s)

As major in Program(s) Code(s)

Geology

As minor in Program(s) Code(s)

Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 210	Photogeology and Remote Sensing	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL		Equivalent ECTS	

Course Content

Photogeology: Elementary photogrammetry: Introduction and characteristics of aerial photographs - Geometric elements of aerial photos and scale variation - Parallax and height difference formula - Stereoscopic vision, stereoscope, vertical exaggeration- Analysis of aerial photographs and landform interpretation -Geologic mapping using aerial photographs . Remote Sensing: The concept of remote sensing - Fundamental Considerations: Units of measure - Electromagnetic Energy - Electromagnetic spectrum -Image Characteristics - Landsat Imagery: Multispectral scanner system - Image characteristics - Orbit paths - Digital Image processing: Image structure - Image processing systems - Image Enhancement - Information extraction - Resource Exploration: Mineral exploration - Uranium Exploration - Oil exploration .

Taught in Program(s)

As major in Program(s) Code(s)

Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 212	Petroleum Provinces in Africa	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

Genesis, geodynamic position (Basin analysis and classification), stratigraphic position, lithology of the oil and gas provinces in Africa. Special topics are the sedimentology features and the structural evolution of deposits (type of the deposit). Future petroleum provinces are of special interest. Objectives (expected results of study and acquired competences) Participants should be able to define the basin types and estimate the oil and gas potential.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 214	Use of minerals in industry	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL		Equivalent ECTS	
Course Content			
Ore formation as a natural process in the crust; Metallogeny - space-time rationale; Mineralisation in relation to tectonics and crystal evolution; Ores in Mafic ultramafic rock, Classification scheme, immiscible liquid segregation, thermodynamic modelling of partitioning of metals with regard to composition of Cu-Ni- Co-sulfide ores; ores in felsic rocks: end-stage processes during felsic magmatism and their ore genetic significance; Hydrothermal fluids, plurality of sources, fluid inclusions, stable isotope studies, complexing and thermodynamic aspects of solubility and precipitation of minerals. Stratiform and stratabound ores, phase equilibria in simple sulfide systems, Fe-S; Fe-Zn-S, Cu-Fe-S, Fe-Ni-S, their application to natural ores. Ores and metamorphism, cause and effect relations.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 216	Risk Assessment and Safety in Petroleum Fields	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	
Course Content			
Various types of crises in Petroleum Fields. Risk assessment in the oil and gas industry. How to set up a crisis management system and how to manage a crisis situation. Awareness of hazards and good judgment based on experience. Safety Management in Oil and Gas extraction field. Appropriate safety and first-aid types of equipment. Safety Awareness Assessment in Fieldwork Environments. Crisis and Safety Management in Oil and Gas field. References:			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
10%	0%		20%		10%	

Chm 298G	Chemistry of Ore Analysis		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
1	-	2	
Required SWL		Equivalent ECTS	
Course Content			
A Brief Introduction about Ores, Minerals and Rocks - General Principles of Analysis /-Statistical Treatment of Analytical Data - Management of Laboratory and Safety - The Alkali Metals - Aluminum Ores / Arsenic Ores / Barium Ores / Beryllium Ores / Boron Minerals / Cadmium Ores / Calcium and Magnesium Minerals / Chromium Ores / Cobalt Ores / Copper Ores / Gold Bearing Ores / Iron Ores / Lead Ores / Manganese Ores / Mercury Ores / Nickel Ores / Phosphorous Minerals / Selenium and Tellurium Minerals / Silicon and Siliceous Materials / Silver Ores / Sulphur Ores / Tin Ores / Titanium Ores / Tungsten Ores / Zinc Ores / Zirconium Ores.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☒ Practical Exam	☐ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
10%	0%		20%		10%	

محتوى المقررات الاختياريه والاجباريه لمتطلب الجامعه

المستوى الثانى (الاختياريه)

Uni 209	Climatic changes		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	0	
Required SWL		Equivalent ECTS	
Course Content			
توصيف المبادئ الأساسية للتغيرات المناخية. التعرف على التغيرات المناخية التي حدثت في الماضي. تحديد المؤشرات الدالة على حدوث التغيرات			

المناخية. شرح تأثيرات التغيرات المناخية على الأنظمة الطبيعية الموجودة في كل من اليابسة والمحيطات والغلاف الحيوى.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Uni 211	History of Ancient Egypt		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	0	
Required SWL		Equivalent ECTS	
Course Content			

دراسة تاريخ مصر منذ عصر ما قبل الكتابة حتى نهاية العصر القديم، والمصادر التى يستقى منها المادة العلمية وطبيعتها، وأصل المصريين، فترة ما قبل الأسرات، والدولة القديمة و الانتقال الاول، والدولة الوسطى والانتقال الثانى، والدولة الحديثة. عصر الأسرات المتأخرة حتى الفتح المقدونى، والنظام السياسى والادارى فى مصر، ومظاهر الحضارة المصرية، وحالة مصر الاقتصادية والاجتماعية، والديانة المصرية القديمة.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Uni 212	Psychology and Sociology	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

تعريف غير المتخصصين فى علم النفس بمدى الاستفادة منه فى تفسير بعض الظواهر الفلسفية، والتعريف بطبيعة علم النفس وأهم أهدافه ومجالاته. دراسة بعض العمليات العقلية العليا كالانتباه والادراك، والتعلم والتذكر، ودراسة الشخصية الانسانيه، ودراسة الانفعالات. استيعاب أهم المفاهيم والنظريات ذات الصلة بموضوعات علم النفس الاجتماعى، وفهم أسس التفاعل الاجتماعى بين الافراد، والوقوف على محدداته وآثاره، وتوظيف المعرفة فى مجال علم النفس الاجتماعى فى المجالات التطبيقية، وتنمية مهارات البحث المكتبى والميدانى المتصلة بموضوعات المادة. دراسة موضوع علم الاجتماع، وأهم المصطلحات السوسيولوجية، ومناهج البحث فى علم الاجتماع، والتنمية البشرية، والثقافة. دراسة الفروع السوسيولوجية: علم اجتماع التنمية، وعلم الاجتماع الريفى وعلم الاجتماع الطبى.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Uni 213	History and Philosophy of Science	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

التعرف على تاريخ العلم فى الحضارة الاسلامية، والتعرف على دور العرب فى تطوير العلم، واستكمال الوعى بمكونات هويتنا الحضارية. دراسة ماهية العلم العربى، والاطار الحضارى للعلم العربى، والاسس المنهجية لدراسة العلم العربى، وترجمة التراث الاجنبى إلى اللغة العربية. أهم العلماء)جابر بن حيان – والرازى – وابن سينا – وابن الهيثم(. دراسة مدخل إلى فلسفة العلم)الفلسفة، والفلسفة العلمية، وفلسفة العلم(، ودلالات العلم) البحث والتطبيق، والمنهج والمحتوى المعرفى، والعلم واللاعلم(. العلم فى المجتمع والتاريخ.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and	☐ GOAL 8: Decent Work	☐ GOAL 9: Industry,	☐ GOAL 10: Reduced	☐ GOAL 11: Sustainable	☐ GOAL 12: Responsible

Clean Energy	and Economic Growth	Innovation and Infrastructure	Inequality	Cities and Communities	Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Uni 214	Ethics of Scientific Research	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

المبادئ الاساسيه لاخلاقيات البحث العلمى. شروط البحث العلمى. المعاٌيير المنهجية للبحث العلمى. حقوق الملكية الفكرية. التشريعات المصرية فى مجال حماية حقوق الملكية الفكرية. اليات نشر وتطبيق اخلاقيات البحث العلمى. اخلاقيات الاقتباس.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Uni 215	Laboratory Safety	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

مصادر الخطوره في المختبرات (المخاطر الطبيعيبه – المخاطر الكيميائيه- الأشعه- المخاطر البيولوجيه) السلامه والوقايه الشخصيه الاسعافات الاوليه وترتيبات المعمل التخلص من النفايات المعمليه ، السلامه فى الدراسات الحقليه.

Taught in Program(s)
As major in Program(s) Code(s)
Geology

As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Uni 216	Skills of Scientific Research		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	0	
Required SWL		Equivalent ECTS	
Course Content			
مفهوم البحث العلمى، اسس البحث العلمى، مناهج البحث العلمى، أنواع البحث العلمى، صفات الباحث المتميز، مهارات البحث العلمى، خطوات البحث العلمى، تحديد الهدف من البحث، اختيار الموضوع والقراءة حوله، تحرير عنوان البحث، وضع الخطة المنهجيه للبحث واعتمادها من جهات الاختصا ص وأصول الاقتباس والترجمة.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Uni 210	Innovation and entrepreneurship		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	0	
Required SWL		Equivalent ECTS	
Course Content			

This course deals with the study of leadership behavior and its importance in building the personality in the institutions and society and knowing the relationship between the leadership and innovation. It also includes a detailed discussion of the personal characteristics of innovators, factors of innovation success and developing the administrative processes, knowing the criteria for building and developing the innovative behavior and practical cases and applications in leadership and management of innovation.

Taught in Program(s)						
As major in Program(s) Code(s)						
Geology						
As minor in Program(s) Code(s)						
Mineral Resources and Petroleum Geology						
Targeted Sustainable Development Goals						
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation	
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production	
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal		

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Uni 218	History of Modern Egypt		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	0	
Required SWL		Equivalent ECTS	

Course Content

معرفة أوضاع المجتمع المصرى فى العصر العثمانى، والحملة الفرنسية وآثارها المختلفة على الصعيدين الخارجى والداخلى .
مشروع التحديث فى عصر محمد على، وموقف القوى الخارجية من ازدياد النفوذ الاجنبى فى مصر، والاحتلال البريطانى لها. دراسة المجتمع المصرى فى العصر العثمانى، والحملة الفرنسية والمجتمع المصرى .الفوضى السياسية فى مطلع القرن19 ،ومحمد على وتجربة التحديث. مظاهر النفوذ الاجنبى فى مصر فى النصف الثانى من القرن 19 ،والثورة العرابيّة والاحتلال البريطانى.

Taught in Program(s)						
As major in Program(s) Code(s)						
Geology						
As minor in Program(s) Code(s)						
Mineral Resources and Petroleum Geology						
Targeted Sustainable Development Goals						
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation	
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production	
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal		

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)

10%	0%	20%	10%

Uni 219	Environmental Culture		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	0	
Required SWL		Equivalent ECTS	
Course Content			
الاطلاع على أحوال البيئة العالمية، والتعرف على المتغيرات البيئيه الاساسيه، والتعرف على مظاهر التلوث وأنماطه، والتوجيه إلى حماية البيئة فى الاغلفه الاربعة، و بيان السبب فى دراسة البيئة.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Uni 220	Philosophy and Critical Thinking		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	0	
Required SWL		Equivalent ECTS	
Course Content			
يحدد موضع التفكير النقدي بين صور التفكير الانساني ومستويات هو أنماطه المختلفة- .يعرف ماهية التفكير النقدي ومهاراته المختلفة- .يكتشف الاخطاء الشائعة في التفكير - يميز بين أنماط التفكير الصحيحة وغير الصحيحة- .يطبق مهارات التفكير النقدي في المواقف الحياتية المختلفة- .يوظف التفكير النقدي والمنطقي في حل المشكلات، واتخاذ القرارات المتنوعة- يُبني الحجج المنطقية، ويفسرها، ويقيمها- .يكتشف مدى صدق وصحة الحجج، وجوانب القوة والضعف فيها- .يحلل الحجج الاستنباطّية والاستقرائيه وينتقدها.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate	☐ GOAL 14: Life Below	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and	☐ GOAL 17: Partnerships to	

Action	Water		Justice Strong Institutions	achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Uni 221	Communication Skills	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

يقدم المقرر مهارات أساسية في الكتابة والتواصل الشخصي مع الآخرين للأغراض العلمية والعملية مما يمكّن الطالب من تقديم ذاته والتعبير بشكل فعال عما يريد إيصاله من معلومات وأفكار وكذلك التعامل مع المعلومات التي يقدمها الغير. - فهم معنى السيرة الذاتية ومعرفة دورها وأهميتها وكيفية توظيفها للتقدم إلى فرصة ما. - معرفة دور رسالة الإرفاق وتكاملها مع السيرة الذاتية، والاستعداد للمقابلة الشخصية. - فهم معنى الاستطلاع أو المسح الاستبياني ومعرفة دوره وأهميته وكيفية توظيف نتائجه. - تصميم الاستبيان وإجراء المسح الاستبياني وتفريغ نتائجه. - معرفة معنى البحث العلمي وكيفية إجرائه. - كيفية تقديم نتائج البحث العلمي في تقرير احترافي. - معرفة أنواع التواصل المباشر وفهم معنى المحاضرة وخصوصيتها. - تصميم مادة محاضرة ومعرفة كيفية إلقائها والاستعداد لذلك وإدارة النقاش خلالها.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Uni 222	Fitness	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

يركز مقرر الصحه واللياقه على الجانب المتعلق بمهارات تطوير الذات من الناحية الصحية والجسدية، وما يرتبط بها من مهارات تتعلق بالصحة الشخصية والغذائية والرياضية والوقائية والنفسية والإنجابية والإسعافات الأولية، مع التركيز على المواقف الحياتية، بهدف إثارة دافعية الطلاب وتشويقهم لعملية التعلم من خلال الإطار العام للمقرر ومعاييره وضوابطه. أما عن وصف اللياقة البدنية فيتمثل دورها بممارسة التمرينات البدنية للمحافظه على الصحة باستخدام الأجهزة الحديثة والتعلم بالترفيه وممارسة بعض الأنشطة الرياضية .

Taught in Program(s)											
As major in Program(s) Code(s)											
Geology											
As minor in Program(s) Code(s)											
Mineral Resources and Petroleum Geology											
Targeted Sustainable Development Goals											
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation						
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production						
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal							
Assessment Weights											
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)						
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam					
40%	20%		10%		30%						
Student Activities Breakdown (Distribution for Study Blocks)											
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)								
10%	0%	20%	10%								

Uni 223	Biodiversity Conservation and Sustainability	2 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0
Required SWL	Equivalent ECTS	
Course Content		
Introduce students in an integrative manner to the field of biodiversity conservation and how to apply its principles to best promote sustainability. Understanding biodiversity and its management requires an interdisciplinary approach with particular reference to mechanisms of change and human impacts on the environment. This course will be interdisciplinary in its approach.		

Taught in Program(s)											
As major in Program(s) Code(s)											
Geology											
As minor in Program(s) Code(s)											
Mineral Resources and Petroleum Geology											
Targeted Sustainable Development Goals											
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation						
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production						
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal							
Assessment Weights											
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)						
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam					
40%	20%		10%		30%						
Student Activities Breakdown (Distribution for Study Blocks)											
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)								
10%	0%	20%	10%								

Uni 224	Political Science and International Relations	2 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0
Required SWL		Equivalent ECTS	
Course Content		
تتناول هذه المادة ماهية و مفاهيم، علم العلاقات الدولية والذي يعد المجتمع الدولي مادته، وعلاقة علم العلاقات الدولية بباقي العلوم الاجتماعية الأخرى، وصولاً لتحديد ماهية الشخص الدولي كمدخل للوقوف على تعدد أشخاص هذا المجتمع، وتفسيرهم من خلال مجموعة معايير ذات الدلالة بقصد تحديد مكانة ودور كل منهم على الساحة وأطراف العلاقات الدولية و المناهج المعاصرة في دراسة العلاقات الدولية بالإضافة الى مدارس العلاقات السياسية الدولية كما يتم تناول مبادئ العلاقات الدولية والعوامل المؤثرة فيها و تطور العلاقات الدولية بين الحربين العالميتين خلال الحرب العالمية الثانية و العلاقات السياسية الدولية في عصر الامم المتحدة وفي ظل الحرب الباردة وانعكاساتها على العلاقات السياسية الدولية بالإضافة للعلاقات الدولية في ظل العولمة.		

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Third Level (Junior year) - Courses of Mineral Resources and Petroleum Geology program

. Geo 301	Mineral Economics	3 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2
Required SWL	-	Equivalent ECTS	-
Course Content		
General terms and classification of mineral deposits of Egypt- Ore deposits-endogenetic and -exogenetic forming processes- gold mines, gem stones including amytest, garnet and rare metals in Egypt. Medical deposits.		

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)		
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam	
40%	20%		10%		30%		

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 311	Ore Microscopy	3 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Ore Microscope - Preparation of Samples for ore microscopy – Optical mineral properties without analyzer- Optical mineral properties under cross nicols- Primary textures of ore minerals- Secondary textures of ore minerals- Mineral paragenesis- Applied ore microscopy in ore dressing.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production

☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 321	Geochemistry of Hydrocarbons	3 CH

Prerequisites	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Students have to learn theoretically and practically the principles of sample selection, holding, preparation, selecting the appropriate method of analysis for the elements they need to analyze, how to avoid the different sorts of errors during handling, preparation, instrumentation and calibration, and how to interpretate the chemical data for evaluation, quantification and estimate the origine and processes of petroleum and gas propagations. Origin and nature of the phytoclast group – Origin and nature of the amorphous group - Origin and nature of the palynomorph group and phytoplankton subgroup - Palynological kerogen classification – Bulk geochemical characterization and classification of organic matter: elemental analysis and pyrolysis - Some practical aspects of palynofacies analysis.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 307	Petroleum Geophysical Prospection	2 CH

Prerequisites	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Illustration of geological and geophysical techniques and approaches used for the description of hydrocarbon reservoirs. Application of different geophysical method and tools in petroleum and gasses prospections.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 309	Isotope Geology	2 CH

Prerequisites	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	-

Required SWL	-	Equivalent ECTS	-

Course Content
Internal structure of atoms; Atomic weight, Nuclear stability and abundance; Isotopes; Decay mechanics of radioactive elements - positron decay, electron capture decay, branchel decay. Beta decay, alpha decay. Decay of a radioactive parent to a stable daughter; Principle of mass spectrometry. K-Ar, Sm-Nd, U Pb and C14 method of dating. Sulphur and Oxygen isotopes and their application in geological studies.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Chm 399G	Petroleum Chemistry	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content
History of Petroleum occurrence -Formation of crude oil , Hypothesis and theories- What is petroleum - Typical crude oil fractions - Important characterization properties - Chemical composition of crude oil- Impurities removal from crude oil (mud, sand, water, salts, sulfur, waxes) - Evaluation of crude oil tools a) Physical studies b) spectral studies c) Gas chromatograph of hydrocarbons d) Elemental studies e) Gravimetric method Petroleum hydrocarbon- Refinery operation processes - Separation processes of petroleum contents Conversion processes A) Cracking processes (Thermal, Hydro, and catalytic)B) Reforming processes (Thermal and catalytic)- Chemical reactions for forming petrochemicals A) Alkylation B) Isomerization C) Polymerization - Treating processes (Hydrotreating processes) i) Desulfurization processes ii) Dewaxing processes - Pyrolysis of hydrocarbons for production of low M.Wt hydrocarbons - Natural gas separation and processing Water, CO2, H2S, RSH, FeS.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 313	Quaternary Geology	2 CH

Prerequisites	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Introduction, Definitions, Quaternary time, Stratigraphic classification of Quaternary, Types of Sediments, Types of Environments, Applied, Engineering, and Economic Importance of Quaternary Deposits.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible

					Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Com 391	Introduction to Python	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Introduction to Python and Computer Programming, Data Types, Variables, Basic Input-Output Operations, Basic Operators. Boolean Values, Conditional Execution, Loops, Lists and List Processing, Logical and Bitwise Operations.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)

10%	0%	20%	10%

Geo 315	Mineral Resources in Egypt	2 CH

Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
1	-	2	
Required SWL	-	Equivalent ECTS	-

Course Content

Introduction and important definitions. Classifications most usually used in mineral deposits. Metallogeny through time: continental growth rates, crustal evolution and plate tectonics. Divergent margins and metallogeny. Convergent margins and metallogeny. Iron Ores of Egypt, Orogenic Gold in the Eastern Desert, Egypt, Titanium-Rich Deposits, Sulfide and Precious Metal Deposits in Egypt, Industrial Metal Oxides (Sn, W, Ta, Nb, and Mo), Chromite Deposits, Uranium Occurrences, Manganese Deposits, Phosphate Deposits, White Sand, Argillic Deposits, Kaolin, Evaporite Deposits.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 302	Geochemical Techniques	3 CH

Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Introduction to whole rock analysis including methods of rock analysis, sample preparation and data processing and interpretation. Mineral chemistry and prop analysis, rock dating methods, including U/Pb, Sm/Nd, Rb/Sr. X- ray diffraction including diffractometer and x-ray pdf references files.

Taught in Program(s)

As major in Program(s) Code(s)

Geology

As minor in Program(s) Code(s)

Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 304 Mineral Exploration 3 CH

Prerequisites

Number of weekly Contact Hours

Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Introduction – Introduction: basic definitions, historical development and future opportunities and complexities. Geological mapping in mineral exploration, overview of various stages of mineral exploration: activities, data and tools. Basic concepts of geological prospecting: geological indicators, lithological and structural controls of mineralization, geobotanical observations. Basic concepts of geochemical prospecting: planning, Soil Sampling, biogeochemical observations analysis and interpretation. Different techniques in mineral exploration: drilling, sampling, core logging, geological plans and sections. Overview of geophysical methods useful in mineral prospecting: airborne survey, magnetic survey, gravity method, electromagnetic method, integration of geological and geophysical data. Principles of reserve estimation: density and bulk density, factors affecting reliability of reserve

estimation, reserve estimation based on geometrical models (square, rectangular, triangular and polygon blocks) regular and irregular grid patterns. Remote Sensing, GIS and computer software applications in mineral exploration.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 306	Stratigraphy	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Principles of Stratigraphy – laws and guidelines – Stratification – Lithostratigraphy –Sequence stratigraphy - Unconformities and Diastems – the Geologic Column –relative Geochronology – Chronostratigraphy of Crypto- & Phanerozoic – Boundary Stratigraphy - Stratigraphic Correlation: biological, chemical and geophysical correlation.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 308	Micropaleontology	3 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Micropaleontology (1): Foraminifera, Morphology –Paleoecology – Classification – Stratigraphic Significance.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 310	Wells drilling and developments	2 CH

Prerequisites	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Drill Site (Finding Oil and Gas, Selecting the Drill Site, Preparing the Drill Site, Moving Equipment to the Drill Site, Rigging Up). Drilling Technology. Analysis of the performance of Drilling Operations for Improving Productivity. Drilling Operations (Drilling and surface hole, Tripping Out. Drilling out, running surface casing, cementing, tripping in, running and Cementing Intermediate Casing, drilling to final Depth, Evaluating Formations, Completing the well). Technological Development of Machine Tool for Machining Materials. Modeling Lost-Circulation into Fractured Formation in Rock Drilling Operations. Special Drilling Operations.

Taught in Program(s)

As major in Program(s) Code(s)

Geology

As minor in Program(s) Code(s)

Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 312	Petroleum Industry	2 CH

Prerequisites	

Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
1		-		2	
Required SWL	-	Equivalent ECTS	-		
Course Content					
The global petroleum processes of exploration, extraction, refining, transporting (pipeline, oil tanker/barge, truck, and rail), and marketing petroleum products. Petroleum Industry Units and Conversions. The petroleum products classification (transportation fuels, fuel oils for heating and electricity generation, asphalt and road oil, and feedstocks for making the chemicals, plastics, and synthetic materials). The largest volume products of the industry fuel oil and gasoline. Sour Crudes, Crudes in the OPEC Basket, Major Oil Supply Disruptions, Tanker Classification, Largest Oil Spills, Refinery Fractions, Largest Gas Fields, Largest Gas Fields, Other Giant Oil and Gas Fields of Historical Interest.					

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 314	Minerals Processing Techniques	2 CH
Prerequisites		

Number of weekly Contact Hours					
Lecture		Tutorial		Laboratory	
1		-		2	
Required SWL	-	Equivalent ECTS	-		
Course Content					

Basic terminology: Surface and Underground Mining of coal and metal, Introduction to Oil Mining Opening up of deposits; Drifting, Shaft sinking, Explosives: types of explosives- their composition and properties; selection of explosives; manufacture, transport, storage and handling of explosives; testing of explosives, destruction of explosives. Blasting: Mechanism of rock fragmentation by blasting; blasting accessories, exploders; blasting practices in opencast and underground mines, compaction and strength.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 316	Palynology	2 CH

Prerequisites	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

(Flora): Introduction – Preparation and Separation –Classification – Terrestrial & marine Plant Fossils – Dinoflagellates – Nannoplanktons – Stratigraphic importance and use of plant fossils as biostratigraphic indicators.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)

Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)		
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam	
40%	20%		10%		30%		

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 318	Geographic Information System in Geology	2 CH

Prerequisites	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content
Introduction- Map and Map Data handling- Components of GIS- Functions of GIS - Advantages of Digitized storage – Data Manipulation- Planning for GIS.

Taught in Program(s)
As major in Program(s) Code(s)
Geo
As minor in Program(s) Code(s)

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 320	Sedimentary Basins Modeling	2 CH

Prerequisites	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Sedimentary basin: Introduction – Principles of Basin Analysis - Development of basin analysis – Types and classification of sedimentary basins. Sedimentary basins and their hydrocarbon filling - basin modeling – Correlation and areas of origin and development - oil forecasting and exploration - risk analysis and economics - reserve calculation and development plans.

Taught in Program(s)

As major in Program(s) Code(s)

Geology

As minor in Program(s) Code(s)

Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Fourth Level (Senior year) - Courses of Mineral Resources and Petroleum Geology program

.

Geo 401	Mine Geology and Quarries	2 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2
Required SWL	-	Equivalent ECTS	-
Course Content		
Geology and mining, ore prospecting and exploration, ore development, mine types, mining operation, Quarries operation, mine opens (levels, panels, shafts), sloping faces, ore examination and evaluation, estimation of ore reserves, geologic problems in mining.		

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 403	Subsurface Geology	3 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2
Required SWL	-	Equivalent ECTS	-
Course Content		
Basic concepts in subsurface geology- Role of subsurface geology in: mining geology, oil industry, construction- Sources of subsurface data – subsurface mapping – methods of interpretation.		

Taught in Program(s)

As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)		
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam	
40%	20%		10%		30%		

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 405	Industrial Minerals and Rocks	3 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

What Is an Ore, Resources, Reserves, and Consumption, Markets, Where to Search and How, Environmental Degradation, Land Use, and Social Responsibility, Mineral Processing, The World of Metals, Iron and Steel Refiners, Precious Metals, Rare-Earth Elements, Metalloids, Sand, Gravel, and Natural Stones, Tuff, Pumice, Perlite, Pozzulan, and Trass, Feldspar, Quartz, and Mica, Aluminium Silicates, Diamond, Fluorite and Baryte,

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)		
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam	
40%	20%		10%		30%		

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 407	Oil and natural gas refining	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Refining Processes (Physical Separation Processes, Chemical Catalytic Conversion Processes, Thermal Chemical Conversion Processes). Refinery Configuration, Type of Products, Environmental Regulation, Crude Assay and Quality, Refinery-petrochemical Integration, Development of New Technology. Refinery Feedstocks and Products. Composition of Crude Oils (Olefins, Naphthenes (cycloalkanes), Aromatics, Sulphur Compounds, Oxygen Compounds, Nitrogen Compounds, Metallic Compounds, Asphaltenes and Resins). Thermophysical Properties of Petroleum Fractions and Crude Oils. Crude Distillation (Process Description, Operation of Crude Distillation Units, Crude Oil Desalting, Vacuum Distillation, Crude Distillation Material Balance, Design of Crude Distillation Units Using Process Simulators).

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 400	Graduation Project	3 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
-	-	-

Required SWL	-	Equivalent ECTS	-
Course Content			
Study of a problem applicable to application of geology in industry, earth science and other related topics to geology. Study of a problem applicable to the petroleum industry. It is an extended, independent, self-directed, piece of practical work integrating and reinforcing the material taught on the course, and giving a detailed insight into the demands and ways of working in the hydrocarbon industry. Geo-environmental hazards risk and analysis, environmental pollution (water, air, soil).			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 499	Field training	3 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
-	-	-

Required SWL	-	Equivalent ECTS	-
Course Content			
Planning a field project, field equipments and tools, safety, field notebook, field observations, sedimentary rocks, field relations, igneous rocks field relations, metamorphic rocks field relations, preparation of field reports, training on mapping, compass survey. Relationship to other geological disciplines, mapping and projection methods, compass, clinometer, strike measurements, presentation of data, plane table description and theory, theodolites description and theory, advantages and disadvantages, GPS description, uses, resolution and controls. Writing a geological report.			

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)		
	☒ Assessment	☐ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam	
40%	20%		10%		30%		

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 409	Environmental impact of mining and petroleum operations	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	-

Required SWL	-	Equivalent ECTS	-

Course Content

Environmental Impacts caused by surface Metal and Ore Mining (Open pits and quarries, Underground mines). Environmental impacts caused by mining operations. Assessment of risks linked to mining waste (Waste rock, Tailings orprocessing waste, Ore stockpiles, Slags, … etc). Pollution Prevention and Control, Development Plans, Tailings Disposal. Environmental impacts of oil and natural gas (refining to the delivery and use). Environmental impacts of coal, Oil Shale, and Tar Sands (use and extractions). Mining waste management. Hazards related to other geologic energy sources (Uranium Mining, Hydropower, … etc).

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)		
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam	
40%	20%		10%		30%		

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)

10%	0%	20%	10%

Geo 411	Radioactive Minerals	2 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2
Required SWL	-	Equivalent ECTS	-
Course Content		
Introduction of Radioactive minerals, Units of measurement, permissible doses of radiation, natural radionuclides, movement of radionuclides through the environment, source of radioactive waste, manmade concentrations of radionuclides, health effects, radioactive waste management.		

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 413	Petroleum Engineering	2 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2
Required SWL	-	Equivalent ECTS	-
Course Content		
Fluid Flow in Petroleum Reservoirs (Fluid Types, Definition of Fluid Flow Regimes, Darcy Fluid Flow Equation, Radial Forms of the Darcy Equation, Derivation of the Continuity Equation in Radial Form, Derivation of Radial Diffusivity Equation for Slightly, Derivation of the Radial Diffusivity Equation for Compressible, Transformation of the Gas Diffusivity Equation with Real Gas). Basic Concepts in Well Test Analysis. Well Test Analysis type curves. Geologic Modeling		

and Reservoir Characterization. Fluid Saturation and influence of wettability and capillary pressure. Radial Flow Analysis of Well Performance. Reservoir Performance Analysis.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)		
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam	
40%	20%		10%		30%		

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 402	Geology of Egypt		3 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	-	Equivalent ECTS	-
Course Content			
Phanerozoic: Morphologic classification of Egypt – Structural framework – Details of the Stratigraphic Sequence In Egypt – Regional Distribution, paleoenvironments, litho- and biostratigraphy of the Paleozoic, Mesozoic and Cainozoic deposits in Egypt – Paleogeography and evolution of paleobasins with special reference to the evolution of the Nile Delta, Gulf of Suez and Red Sea - Geology of selected areas: in the Western Desert; Nile Valley; Eastern Desrt; Gulf of Suez, etc . Basement Rocks in Egypt; Evolution & Main features; Island arc stage; Metavolcanic and associated volcaniclastics; Cordillera stage; Granites; Dokhanvolcanics - Katherina Volcanics.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)			
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam		
40%	20%		10%		30%			
Student Activities Breakdown (Distribution for Study Blocks)								
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)			
10%	0%		20%		10%			

Geo 404	Geochemistry of Crystalline Rocks	2 CH
Prerequisites		

Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
1	-	2	
Required SWL	-	Equivalent ECTS	-

Course Content

The Major Elements: Rock and mineral compositions, Wt.% and Molar Proportions • Compositions of Igneous, Sedimentary and Metamorphic Rocks and Ternary Diagrams • Igneous Rocks: Magmas and Crystal Fractionation • Sedimentary Rocks and Chemical Weathering • Metamorphic Rocks and Mineralogical Changes during prograde metamorphism, Igneous Petrology: Compatible and Incompatible Elements • Sedimentary Petrology: Labile and Conservative Elements • Rare Earth and Incompatible Elements in Igneous and Sedimentary Environments, The Chemical Potential and phase stability as a function of composition • Theory and use of Distribution Coefficients. • Calculated and observed distribution of Fe and Mg between melts and basaltic magma.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights								
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)			
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam		
40%	20%		10%		30%			
Student Activities Breakdown (Distribution for Study Blocks)								
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)			
10%	0%		20%		10%			

Geo 406	Modelling of Petroleum Reservoir	2 CH
Prerequisites		

Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
1	-	2	
Required SWL	-	Equivalent ECTS	-
Course Content			
In the oil and gas industry, reservoir modeling involves the construction of a computer model of a petroleum reservoir, for the purposes of improving estimation of reserves and making decisions regarding the development of the field, predicting future production, placing additional wells and evaluating alternative reservoir management scenarios.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)		
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam	
40%	20%		10%		30%		

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 408	Mineral Resources in Egypt	2 CH
Prerequisites		

Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
1	-	2	
Required SWL	-	Equivalent ECTS	-
Course Content			
Mineral Resources in Egypt. The Mines and quarries (mining, ore prospecting and exploration in Egypt). The ore development, mine types, mining operation, Quarries operation, mine opens (levels, panels, shafts), sloping faces, ore examination and evaluation, estimation of ore reserves, geologic problems in mining. Classification and distribution of the ore deposits, ores in igneous rocks, and ores of veins association in Egypt. Economic aspects, starboard and stratiform ore deposits, strata bound residual deposits and supergene enrichment, ores of metamorphic affiliation in Egypt. Preparation of polished sections, microchemical techniques, paragenesis and formation conditions of ore minerals, ore forming process.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 410	Well and drilling technology	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	-

Required SWL	-	Equivalent ECTS	-

Course Content

The basic rotary drilling system and well design. In particular down hole tools like drill pipes, drill collars or drilling bits and other hardware like blow out preventers and solid control systems are discussed. The well construction process including casing or cementing is a focal point of this lecture. The course also provides a basic understanding of directional drilling, well bore stability, formation pressure, well control, or drilling performance. Finally, drilling fluids and basic drilling hydraulics should give the student a general overview of the rotary drilling system. Design the drilling concept under geological demand. Supervise the drilling work on the location. Documentation the drill samples including the drilling relevant parameters. Design for exploring hydrocarbons. Detailed planning for example wells based on offset information, cost considerations (AFE), bit selection, recommended drilling procedures and typical calculations like trajectory design, drill pipe design, casing design, mud hydraulics and cementing requirements.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work	☒ GOAL 9: Industry, Innovation and	☐ GOAL 10: Reduced	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and

	and Economic Growth	Infrastructure	Inequality		Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 412	Economic evaluation of petroleum and minerals	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Insight into the fundamentals of economic evaluation procedures in petroleum exploration and production. Net present value, internal rate of return, and discounted profit of investment. Theory of Economic evaluation of petroleum and minerals. Commodities: supply and demand; business cycles; exchange rates; metal and coal markets and hedging; long-term contracts and the spot market; commodity pricing and mine revenue calculation. Sources and types of market-related information; particular international market characteristics; trade barriers; cartels, regional and sub-regional economic groups; factors related to particular mineral commodities. The recognition of export opportunities; stages in the development of a market strategy; value added mineral products and export marketing. Case histories; in-course evaluation of market impact on a specific mining project. Ore Evaluation Grade, tenor, geographic location, geologic occurrence, stock, costs, marketing, minimum profit, world price, environmental problems, safety, disposal of wastes, water, dust, transportation, ventilation, illumination, support roof, accommodation, power source. processing, exploitation, impurities, development, purchase of rights, operation costs, taxes, wages, maintenance, underground temperature, gangue minerals and crude oil.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Mineral Resources and Petroleum Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam

40%	20%	10%	30%
Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Geo 414	Biostratigraphy & Paleoenvironment	2 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2
Required SWL	-	Equivalent ECTS -
Course Content		
Fundamental ecologic principles, the marine ecosystem, life habits, limiting factors (temperature, oxygen, water depth, salinity, substratum, and food), spatial distribution of population, fossil communities (limiting factors and species interaction, organic reef communities, soft bottom communities, and terrestrial communities), post-mortem information loss.		

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)		
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam	
40%	20%		10%		30%		
Student Activities Breakdown (Distribution for Study Blocks)							
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)		
10%	0%		20%		10%		

Geo 416	Environmental Geophysics	2 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2
Required SWL	-	Equivalent ECTS -
Course Content		
Study of stratigraphic units and structural phenomena - mapping salt bodies - determining solid layers and intersections - mapping freezing zones - assessing conditions for engineering and		

subsurface work - assessment of construction sites of dams and reservoirs - excavation of antiquities - studies of mining and their follow-up - exploration of caves and sinkholes - exploration and identification of buried metal vessels and equipment - assessment of ground water reservoirs - landfills studies - monitoring of pollution and emissions from drainage areas.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)		
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam	
40%	20%		10%		30%		

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

Sta 292	Geostatic	2 CH
Prerequisites		

Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	-	
Required SWL	-	Equivalent ECTS	-

Course Content

Introduction - Statistical Inference - Population - Sample - Parameters - Sampling Distribution - Variance& Covariance - Basic Statistic - Univariate Statistic - Multivariate Statistic: Factor analysis - Principal component analysis (PCA) - Two groups discriminate function analysis (TGDFA) - Cluster analysis - Application of some Computer programs and software in Geology (graphs, Mapping, Modeling, image analysis).

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Mineral Resources and Petroleum Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☒ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	
Assessment Weights					

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☒ Assessment	☐ Exam
40%	20%		10%		30%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
10%	0%	20%	10%

برامج قسم الجيولوجيا

2-البرنامج الدراسي لبرنامج

الجيولوجيا الهندسية والبيئية

(برنامج منفرد بمصروفات)

برنامج الجيولوجيا الهندسية والبيئية

First Level - Courses of Engineering and Environmental Geology program

Semester	Course code	Course name	Prerequisites	Course name	Hours				Grades					
					Theoretical	Practical	Exercises	Credit Hours	Midterm	Ongoing evaluation	Oral exam	Practical exam	Final exam	Total
	Compulsory Courses (11 Credit Hours)													
First	Geo 101	Physical and Historical Geology	-	جيولوجيا طبيعية وتاريخية	2	2	-	3	10	10	10	20	50	100
	Chm103G	Basics of General Chemistry I	-	اساسيات الكيمياء العامة 1	2	2	-	3	10	10	10	20	50	100
	Phy 103	General Physics (1)	-	فيزياء عامة	2	2	-	3	10	10	10	20	50	100
	Zoo 101	General Zoology	-	حيوان عام	1	2	-	2	10	10	10	20	50	100
	Mat 101	General Mathematics	-	رياضة عامة	2	-	-	2	20	20	10	-	50	100
	Uni 109	Information Technology	-	نظم معلوماتية	2	-	-	2	20	10	10	-	60	100
	Uni 107	Societal issues	-	القضايا المجتمعية	2	-	-	-	-	-	-	-	-	-
Total							17							600
Second	Geo 102	Minerals and Rocks	Geo 101	معادن وصخور	2	2	-	3	10	10	10	20	50	100
	Geo 104	Crystallography	-	علم البلورات	2	2	-	3	10	10	10	20	50	100
	Chm104G	Basics of General Chemistry II	Chm 103G	اساسيات الكيمياء العامة 2	2	2	-	3	10	10	10	20	50	100
	Bot 102	General Botany	-	نبات عام	1	2	-	2	10	10	10	20	50	100
	Phy 104	General Physics (2)	Phy 103	فيزياء عامة 2	1	2	-	2	10	10	10	20	50	100
	Com 104	Computer fundamentals	-	مبادى الحاسب الالى	1	2	-	2	10	10	10	20	50	100
	Uni 108	English for Science	-	لغة انجليزية للعلوم	2	-	-	2	20	10	10	-	60	100
Total					17									700
Total of both semesters					34								1300	

برنامج الجيولوجيا الهندسية والبيئية

Second (Sophomore year) - Courses of Engineering and Environmental Geology program

Semester	Course code	Course name		Prerequisites	Hours				Grades					
					Theoretical	Practical	Exercises	Credit Hours	Midterm	Ongoing evaluation	Oral exam	Practical exam	Final exam	Total
Compulsory Courses (13 Credit Hours)														
First	Geo 201	Engineering geology	جيولوجيا هندسية	Geo 101	2	2	-	3	10	10	10	20	50	100
	Geo 203	Environmental geology	جيولوجيا بيئية	Geo 101	2	2	-	3	10	10	10	20	50	100
	Geo 205	General geophysics	جيوفيزياء عامة	-	2	2	-	3	10	10	10	20	50	100
	Geo 207	Petrology	بترولوجية المعادن	Geo 102	1	2	-	2	10	10	10	20	50	100
	Geo 209	Petrophysics	بتروفيزيك	Geo 102	1	2	-	2	10	10	10	20	50	100
	Optional Courses(students should choose 4 credit Hours including 2 hrs. of university requirements)													
	Geo 211	Astronomy	علم الفلك	-	1	2	-	2	10	10	10	20	50	100
	Geo 213	Geomorphology	جيومورفولوجى		1	2	-	2	10	10	10	20	50	100
	Geo 215	Stratigraphy	طبقات		1	2	-	2	10	10	10	20	50	100
	Phy 213	Atmospheric physics	فيزياء الجو	Phy 103	2	-	-	2	20	10	10	-	60	100
	Uni 209	University requirement	متطلب جامعة	-	2	-	-	2	20	10	10	-	60	100
Total								17						700
Compulsory Courses (11 Credit Hours)														
Second	Geo 202	Plane Survey and field geology	مساحة وجيولوجيا الحقل	-	2	2	-	3	10	10	10	20	50	100
	Geo 204	Structural geology	جيولوجيا تركيبية	Geo 102	1	2	-	2	10	10	10	20	50	100
	Geo 206	Hydrogeology	جيولوجيا المياه	-	2	2	-	3	10	10	10	20	50	100
	Geo 208	Environmental impact of mining and petroleum operations	التأثير البيئيى لعمليات التعدين والبترول	-	2	2	-	3	10	10	10	20	50	100
	Optional Courses(students should choose 6 credit Hours including 2 hrs. of university requirements)													
	Geo 210	Limnology	علم المسطحات المائية	-	2	-	-	2	20	10	10	-	60	100
	Phy 214	Physics of Waves and Vibrations	فيزياء الاهتزازات والموجات	Phy 103	2	-	-	2	20	10	10	-	60	100
	Mat 216	Differential equations	معادلات تفاضلية	Mat 101	2	-	-	2	20	10	10	-	60	100
	Chm 298	Chemistry of Ore Analysis	كيمياء تحليل الخامات	Chm103 G	1	2	-	2	20	20	10	-	50	100
	Uni 210	University requirement	متطلب جامعة	-	1	2	-	2	10	10	10	20	50	100
Total								17						700
Total of both semesters								34						1400

برنامج الجيولوجيا الهندسية والبيئية

Third Level (Junior year) - Courses of Engineering and Environmental Geology program

Semester	Course code	Course name		Prerequisites	Hours				Grades					
					Theoretical	Practical	Exercises	Credit Hours	Midterm	Ongoing evaluation	Oral exam	Practical exam	Final exam	Total
Compulsory Courses (11 Credit Hours)														
First	Geo 301	Engineering Geophysics	جيوفيزياء هندسية	Geo 205	2	2	-	3	10	10	10	20	50	100
	Geo 303	Advanced Engineering and environmental geology	جيولوجيا هندسية وبيئية متقدمة	Geo 201	2	2	-	3	10	10	10	20	50	100
	Geo 305	Special course in engineering geology	مقرر خاص فى الجيولوجيا الهندسية	Geo 201	2	-	-	2	20	10	10	-	60	100
	Geo 307	Structural analysis	تحليل التراكيب	Geo 204	2	2	-	3	10	10	10	20	50	100
	Optional Courses(students should choose 6 credit Hours)													
	Geo 309	Sedimentary rocks	صخور رسوبية	Geo 102	1	2	-	2	10	10	10	20	50	100
	Geo 311	Quaternary geology	جيولوجيا الحقب الرابع	-	1	2	-	2	10	10	10	20	50	100
	Geo 313	Diagenesis	تغييرات ما بعد الترسيب	-	1	2	-	2	10	10	10	20	50	100
	Mat 321	Numerical analysis	تحليل عددى	Mat 216	1	2	-	2	10	10	10	20	50	100
Total								17						700
Compulsory Courses (11 Credit Hours)														
Second	Geo 302	Rock mechanics	ميكانيكا الصخور	Geo 207	2	2	-	3	10	10	10	20	50	100
	Geo 304	Soil mechanics	ميكانيكا التربة	Geo 207	2	2	-	3	10	10	10	20	50	100
	Geo 306	Special course in Environmental geology	مقرر خاص فى الجيولوجيا البيئية	-	2	-	-	2	20	10	10	-	60	100
	Geo 308	Advanced Hydrogeology	جيولوجيا المياه المتقدمة	Geo 206	2	2	-	3	10	10	10	20	50	100
	Optional Courses(students should choose 6 credit Hours)													
	Geo 310	Photogeology and remote sensing	جيولوجيا تصويرية وإستشعار عن بعد	-	1	2	-	2	10	10	10	20	50	100
	Geo 312	Mining geology	جيولوجيا المناجم	Geo 207	1	2	-	2	10	10	10	20	50	100
	Geo 314	Sequence stratigraphy and sedimentary basin	تتابع طبقى واحواض ترسيب	-	1	2	-	2	10	10	10	20	50	100
	Geo 316	Sedimentary Basins Modeling	نمذجة أحواض ترسيب	-	1	2	-	2	10	10	10	20	50	100
	Chm 318G	Electro-chemistry	الكيمياء الكهربائية	Chm 298	1	2	-	2	10	10	10	20	50	100
	Chm 320G	Water analysis	تحليل مياه	Chm 298	1	2	-	2	10	10	10	20	50	100
Total								17						700
Total of both semesters								34						1400

برنامج الجيولوجيا الهندسية والبيئية

Fourth Level (Senior year) - Courses of Engineering and Environmental Geology program

Semester	Course code	Course name		Prerequisites	Hours				Grades					
					Theoretical	Practical	Exercises	Credit Hours	Midterm	Ongoing evaluation	Oral exam	Practical exam	Final exam	Total
Compulsory Courses (13 Credit Hours)														
First	Geo 401	Engineering and environmental geology in Egypt	الجيولوجية الهندسية والبيئية فى مصر	-	1	2	-	2	10	10	10	20	50	100
	Geo 403	Slope stability and in situ testing	استقرار المنحدر والاختبار في الموقع	-	2	2	-	3	10	10	10	20	50	100
	Geo 405	Engineering of Dams and reservoirs	هندسة السدود والخزانات	Geo 308	1	2	-	2	10	10	10	20	50	100
	Geo 407	Subsurface geology	جيولوجيا تحت سطحية		2	2	-	3	10	10	10	20	50	100
	Geo 400	Scientific Research Course	مقرر البحث العلمي	-	2	2	-	3	Continuous					
	Geo 499	Geological field tranining and field trips	تدريب حقلى	-	-	-	-	3	20 % report + 20 % supervision + 60 % discussion					100
	Optional Courses(students should choose 4 credit)													
	Sta 409	Geostatics	الجيولوجيا الإحصائية	-	2	-	-	2	20	10	10	-	60	100
	Geo 409	Environmental geochemistry	الجيوكيمياء البيئية	-	1	2	-	2	10	10	10	20	50	100
	Geo 411	Hydrogeochemistry	جيوكيمياء المياه	-	1	2	-	2	10	10	10	20	50	100
	Geo 413	Geological hazards	مخاطر جيولوجية	-	1	2	-	2	10	10	10	20	50	100
			Total				17							700
Compulsory Courses (11 Credit Hours)														
Second	Geo 404	Environmental Geophysics	الجيوفيزياء البيئية	Geo 301	2	2	-	3	10	10	10	20	50	100
	Geo 406	Building materials	مواد البناء	-	2	2	-	3	10	10	10	20	50	100
	Geo 408	Economic geology	جيولوجيا اقتصادية	-	1	2	-	2	10	10	10	20	50	100
	Geo 400	Scientific Research Course	مقرر البحث العلمي	-	2	2	-	3	40 report, 40 supervision, 20 discussion					100
	Optional Courses(students should choose 6 Hours)													
	Geo 410	Well logging	تسجيلات ابار	-	1	2	-	2	10	10	10	20	50	100
	Geo 412	Geology of Egypt	جيولوجية مصر	-	1	2	-	2	10	10	10	20	50	100
	Geo 414	Hydrogeology of Egypt	هيدروجيولوجية مصر	-	1	2	-	2	10	10	10	20	50	100
	Geo 416	Archeogeophysics	الجيوفيزياء الأثرية	-	1	2	-	2	10	10	10	20	50	100
Total							17							800
Total of both semesters							34							1500

المحتوى العلمي لمقررات برنامج الجيولوجيا الهندسية والبيئية

(برنامج منفرد بمصروفات)

المحتوى العلمى لمقررات
برنامج الجيولوجيا الهندسية والبيئية

Course's Contents of Engineering and Environmental Geology

-

First Level - Courses of Engineering and Environmental Geology program

Geo 101	**Physical and Historical Geology**					**3 CH**
Prerequisites	-					
Number of weekly Contact Hours						
Lecture		Tutorial		Laboratory		
2		-		2		
Required SWL	-	Equivalent ECTS	-			
Course Content						
Introduction to geology, minerals and rock, weathering, running water and underground water, glaciers, desert and winds, earthquakes and earth's interior, plate tectonics and crustal deformation, the ocean floor and its evolution, planetary geology, an introduction to environmental geology. History of the earth, the geological record, radioactivity and radioactive dating, the geologic time scale, the standard geologic column, the Proterozoic revolution, Younger Proterozoic, the Paleozoic, the Mesozoic, the Cenozoic, the human habitat.						

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Chm 103G	**Basics of General Chemistry (I)**		**3 CH**
Prerequisites	-		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	-	Equivalent ECTS	-
Course Content			
The history of atomic theory-Different Atomic models- Thomson Model of Atom- Bohr Model of the Atom- Rutherford's Nuclear Model of Atom- - Electron Discovered- Protons & Nucleus Discovered- Electron's Charge Measured- Quantum Model of the Atom- Quantum number- Modern Atomic Theory- Schrodinger's atomic Model (The Cloud Model)- de Broglie (Dual Behaviour of Matter)- Heisenberg's Uncertainty Principle- Quantum Mechanical model of atom (Schrodinger's equation)- Shapes of Atomic Orbitals- Filling of Orbitals in Atom- Aufbau Principle-Hond rules-Periodic table-Periodic table properties- ionization energy-electronegative force-electron affinity-oxidation and reduction state- types of bonds – hybridization.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Phy 103	**General Physics for Geology (1)**		**3 CH**
Prerequisites	-		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	-	Equivalent ECTS	-
Course Content			
Electricity and Magnetism: Electric charge, Types of Charging, and Coulomb's law, The Electric Field, Electric Flux ,Gauss Law, Electric Potential, Capacitors and Capacitance, Combination of capacitors, Current and Resistance, Ohm's Law, Combination of Resistors, Electrical Energy and Power, Kirchhoff's Rules, The Magnetic Field, Force on an Electric Charge Moving in a Magnetic Field, Ampere's Law Properties of Matter: Measurement (The physical quantities, Units and standards of units, The international system of unit, Standard of time, Standard of mass ,Standard of length, Dimensional analysis), Vectors (Vector and scalar quantities, Components of vectors, Adding vectors, Multiplying vectors, Scalar product, Vector product), Properties of Matter (Elasticity and fluid mechanics), Fluid statics (Pressure and density, Fluid at rest, Variation of pressure with the height in static fluid, Pascal's principle, Archimedes principle, Pressure measurements, Surface tension), Fluid Dynamics.			

Taught in Program(s)

As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Zoo 101	**General Zoology**		**2 CH**
Prerequisites	-		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
1	-	2	
Required SWL	-	Equivalent ECTS	-
Course Content			
Introduction in Cytology - Cell components and ultra-structure of the animal cell - cell division (mitosis and meiosis) – introduction of tissues types – introduction to the basis of taxonomy- General characters of kingdom and their major phyla and classes.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Mat 101	**General Mathematics I**					3 CH
Prerequisites	-					
Number of weekly Contact Hours						
Lecture		Tutorial		Laboratory		
2		-		2		
Required SWL	-	Equivalent ECTS	-			
Course Content						
Preliminaries the real number system, Inequalities, Absolute values, The rectangular coordinate system, The straight line. Functions and limits: Functions and their graphs, Operations on functions, the trigonometric functions, Limit of functions, Continuity of functions. The derivative: Definition of derivative rules for finding derivative, Derivatives of trigonometric functions, the chain rule, Derivatives of exponential and logarithm functions, Higher-order derivatives. Applications of the derivatives: Maxima and minima, the mean theorem. Integral: Antiderivatives (Indefinite integrals), the definite integral, Applications of the definite integral.						

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	40%		10%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 102	**Minerals and Rocks**					3 CH
Prerequisites	-					
Number of weekly Contact Hours						
Lecture		Tutorial		Laboratory		
2		-		2		
Required SWL	-	Equivalent ECTS	-			
Course Content						
Physical properties of minerals, chemical properties, identification and descriptive mineralogy, optical mineralogy, structural mineralogy, rock-forming minerals (silicates, accessory minerals and non-silicate minerals), introduction to Igneous rocks, Sedimentary rocks, and Metamorphic rocks.						

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable	☐ GOAL 8: Decent Work	☒ GOAL 9: Industry,	☐ GOAL 10: Reduced	☐ GOAL 11: Sustainable	☐ GOAL 12: Responsible

and Clean Energy	and Economic Growth	Innovation and Infrastructure	Inequality	Cities and Communities	Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 104	**Crystallography**	**3 CH**
Prerequisites	-	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Crystalline State Crystal Parts, Law of Constancy of Interfacial Angles, Crystal Aggregates, Crystal Twin, Zones, Crystal Form, Crystal Habit, Crystal Symmetry, Crystallographic Axes, The Seven Crystal Systems, Axial Ratios, Parameters & Indices, Classification & Nomenclature of Crystal Forms, The Holosymmetric Classes of the Seven Crystal Systems.

Taught in Program(s)

As major in Program(s) Code(s)

Geology

As minor in Program(s) Code(s)

Engineering and Environmental Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Chm 104G	**Basics of General Chemistry (II)**			**3 CH**
Prerequisites	-			
Number of weekly Contact Hours				
Lecture		Tutorial		Laboratory
2		-		2
Required SWL	-	Equivalent ECTS	-	
Course Content				
Synthesis of Alkane – Alkene – Alkyne and its reaction- Synthesis of aliphatic alcohols and its reaction- Synthesis of aliphatic aldehyde, ketone, and its reaction- Synthesis of aliphatic carboxylic acid and its reaction- Synthesis of alkyl halide and its reaction- Synthesis of aliphatic amine (primary, secondary, tertiary) and its reaction- Synthesis of oxime and its reaction- Synthesis of ester and ether and its reaction.				

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Bot 102	**General Botany for Geology**			**3 CH**
Prerequisites	-			
Number of weekly Contact Hours				
Lecture		Tutorial		Laboratory
2		-		2
Required SWL	-	Equivalent ECTS	-	
Course Content				
Plant Kingdom: Plant Classification System, Viruses, Bacteria, Cyanobacteria, Algae, Fungi, Lichen, Embryophytes, Bryophyta, Pteridophyte, Gymnosperms, Angiosperm, General Characteristics and Life Cycle of Each Group.				

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
-	-		-		-	

Phy 104	**General Physics for Geology (2)**		**2 CH**
Prerequisites	-		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
1	-	2	
Required SWL	-	Equivalent ECTS	-
Course Content			
Geometric Optics and Acoustics: Nature and propagation of light- hygens theory and its applications- Lenses and mirrors- optical instruments - Vision defects- introduction to wave optics- Sound waves- Sound transferring trough gases and solids- Doppler effect- Ultrasound waves and its measurements piezo effect. Heat and principles of thermodynamics: Heat- thermal equilibrium– measurement of temperature, temperature scales, kinetic theory of gases- Thermal expansion, Heat as a form of energy, Quantity of heat and specific heat- Thermal conductivity, Heat and work, Jul and Thomson phenomena.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
-	-		-		-	

Com 104	**Computer Fundamentals**		**2 CH**
Prerequisites	-		
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
1	-	2	
Required SWL	-	Equivalent ECTS	-
Course Content			
Introduction: Brief history of computing; the components of a computing system. Machine level representation of data: Bits, bytes, and words; numeric data representation and number bases; signed and twos-complement representations; fundamental operations on bits; representation of nonnumeric data.			

Digital logic: Switching circuits; gates; memory. Assembly level machine organization: Basic organization of the von Neumann machine; control unit; instruction fetch, decode, and execution; instruction sets and types; assembly/machine language programming; instruction formats. Hardware realizations of algorithms: Data representation; the von Neumann model of computation; the fetch/decode/execute cycle; basic machine organization. Operating systems and virtual machines: Historical evolution of operating systems; responsibilities of an operating system; basic components of an operating system. Computing applications: Word processing; spreadsheets; editors; files and directories. Introduction to net-centric computing: Background and history of networking and the Internet; demonstration and use of networking software including e-mail, telnet, and FTP.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Second Level (Sophomore year) - Courses of Engineering and Environmental Geology program

Geo 201	Engineering Geology	3 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL		Equivalent ECTS	

Course Content

Engineering Geology (1): Introduction, Definitions, History and Aims of Engineering Geology, Role of E.G. in engineering projects, Exploration methods (direct & indirect), Engineering Description and classification of soil and rocks, Geotechnical investigations in situ, Engineering importance of joints, faults and folds, Groundwater and soil and rock foundation, Karst-water and its engineering problems, Method of treatment, weathering under geotechnical view, Landslides (cases and its safety), basis of geological structure, strength of geologic material, ground invertigation, slope stability, Reservoirs and Dams, Excauations, Ground treatment and support.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health	☐ GOAL 4: Quality	☐ GOAL 5: Gender	☐ GOAL 6: Clean Water

		and Well-being	Education	Equality	and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 203	**Environmental geology**	**3 CH**
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL		Equivalent ECTS	

Course Content

Environmental Geology (1): Definitions and principals concepts, Earth Materials and geological processes, soil and environment (soil pollution), Land use and soil, natural hazards, flooding and environment, Earthquake and Environment, volcanic activity and environment, coastal hazards .

Taught in Program(s)

As major in Program(s) Code(s)

Geology

As minor in Program(s) Code(s)

Engineering and Environmental Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 205	**General geophysics**	**3 CH**
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL		Equivalent ECTS	

Course Content

Introduction – basis of electric methods – basis of seismic methods – basis of gravity methods – bases of magnetic methods – bases of geo-radar methods .

Taught in Program(s)											
As major in Program(s) Code(s)											
Geology											
As minor in Program(s) Code(s)											
Engineering and Environmental Geology											
Targeted Sustainable Development Goals											
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation						
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production						
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal							
Assessment Weights											
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)						
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam					
-	20%		30%		50%						
Student Activities Breakdown (Distribution for Study Blocks)											
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)								
-	-	-	-								

Geo 207	**Petrology**		**2 CH**
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
1	-	2	
Required SWL		Equivalent ECTS	
Course Content			
Igneous Rocks Introduction, Recognition, Structures and classification of Igneous rocks; Magma genesis. Metamorphic Rocks: Definitions, agents and types of metamorphism; Structures, texture and Classification of metamorphic rocks; contact metamorphism; regional metamorphism; dynamic metamorphism .Sedimentary Rocks: Structures, Textures, compositions and classification of sedimentary rocks; sedimentary provenance, processes and diagenesis .			

Taught in Program(s)											
As major in Program(s) Code(s)											
Geology											
As minor in Program(s) Code(s)											
Engineering and Environmental Geology											
Targeted Sustainable Development Goals											
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation						
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production						
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal							
Assessment Weights											
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)						
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam					
-	20%		30%		50%						
Student Activities Breakdown (Distribution for Study Blocks)											
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)								
-	-	-	-								

Geo 209	Petrophysics	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL		Equivalent ECTS	

Course Content

Introduction – Characters of reservoirs - Porosity of rocks and factors influence on Porosity - Assessment of Volumetric Proportions of Rock constituents - measurements used to quantify effective porosity, saturations, and permeability of the reservoir – Relative permeability and oil-water system - Relationship between resistivity and salinity - Contact phenomena between water and rock capillarity - Absolute permeability – Resistivity & Conductivity .

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 211	Astronomy	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL		Equivalent ECTS	

Course Content

States of the matter in the universe; Stars' magnitude and distance modulus; Luminosity and brightness of stars; Poison formula to measure the distance of stars; H-R diagram of stars; Stellar classification; Stellar equilibrium; Star formation; Stellar stages Data-analytical programs.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 213	**Geomorphology**	**2 CH**
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL		Equivalent ECTS	

Course Content

The scope of Geomorphology - Some fundamental concepts & principles - The fluvial geomorphologic cycle - Karsting& karst topography - Arid landscape - Influence of geologic structures upon topography - Applied geomorphology .

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 215	**Stratigraphy**	**2 CH**
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL		Equivalent ECTS	

Course Content

Principles of Stratigraphy – laws and guidelines – Stratification – Lithostratigraphy –Sequence stratigraphy - Unconformities and Diastems – the Geologic Column -Geochronology – Chronostratigraphy of Crypto- & Phanerozoic – Boundary Stratigraphy - Stratigraphic Correlation: biological, chemical and geophysical correlation .

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
-	-		-		-	

Phy 213	**Atmospheric physics**	**2 CH**
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

Atmosphere (its properties - its components - its layers), the density of the atmosphere (definition – calculation - density), the atmospheric pressure (definition - changes – effect of temperature), the thermal equilibrium of the atmosphere, the water vapor in the atmosphere (characteristics - its effect - density), Stability and instability in the air. Wind (definition - types - changes), range of view. Clouds (methods of their formation - their properties - their types) .

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
-	-		-		-	

Geo 202	**Plane Survey and field geology**	**3 CH**
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL		Equivalent ECTS	

Course Content

Surveying instruments, field mapping, field sampling (mineral, rocks, and water sampling), air reconnaissance, photography and mapping, subsurface geologic surveying, geologic, presentation of data, interpretation of geologic maps, geologic computations, geologic reports, introduction to geophysical surveying, introduction to geodetic surveying.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)

Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☒ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 204	**Structural geology**	**2 CH**
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL		Equivalent ECTS	

Course Content

Primary Structures: Diapers and impact structures - Folds and Folding: Geometry, classification, systems, & mechanics - Brittle Failure and Joints: Origin and tectonic interpretation of joints - Faults and Faulting: Geometry, characteristics of fault zone - Fault system – genetic classification of faults – Faulting and society.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 206	**Hydrogeology**	**3 CH**
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL		Equivalent ECTS	

Course Content

Hydrologic cycle, Hydrogeologic properties of groundwater aquifer, fundamentals of groundwater, porosity and hydraulic conductivity of different rocks and sediments, effective porosity, Darcy's law, fundamental equations of

steady and unsteady groundwater flow, geophysical exploration methods for groundwater, groundwater quality, groundwater development and management, groundwater modelling, hydrogeology of Egypt.

Taught in Program(s)						
As major in Program(s) Code(s)						
Geology						
As minor in Program(s) Code(s)						
Engineering and Environmental Geology						
Targeted Sustainable Development Goals						
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation	
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production	
☐ GOAL 13: Climate Action	☒ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal		

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 208	**Environmental impact of mining and petroleum operations**	**3 CH**

Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL		Equivalent ECTS	
Course Content			

Environmental Impacts caused by surface Metal and Ore Mining (Open pits and quarries, Underground mines). Environmental impacts caused by mining operations. Assessment of risks linked to mining waste (Waste rock, Tailings or processing waste, Ore stockpiles, Slags, … etc). Pollution Prevention and Control, Development Plans, Tailings Disposal. Environmental impacts of oil and natural gas (refining to the delivery and use). Environmental impacts of coal, Oil Shale, and Tar Sands (use and extractions). Mining waste management. Hazards related to other geologic energy sources (Uranium Mining, Hydropower, … etc).

Taught in Program(s)						
As major in Program(s) Code(s)						
Geology						
As minor in Program(s) Code(s)						
Engineering and Environmental Geology						
Targeted Sustainable Development Goals						
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation	
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production	
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal		

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 210	Limnology	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	-

Required SWL		Equivalent ECTS	

Course Content

Introduction of limnology, Origin of Lakes (Tectonic processes, Volcanism, Landslides, Glaciations, Lakes formed by rivers, Solution Lakes, Lakes associated with shorelines, Meteor Impact, Desert lakes, Biogenic Lakes, and Human Made Lakes), African Rift Lakes, Rift Valley Lakes. The largest lakes in the world.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Phy 214	Physics of Waves and Vibrations	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

Simple harmonic motion, motion in mechanical and electrical systems - Total power of harmonics - Interconnection of oscillators - Wave motion in dissipated and non-dissipating media – Longitudinal, transverse and standing waves - Phase velocity and group velocity - Wave transfer Energy - the sum of the harmonic waves in two dimensions - the ultrasound -Doppler effect .

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Mat 216	**Differential equations**	**2 CH**

Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	0	
Required SWL		Equivalent ECTS	

Course Content

First order and first degree ODE's: Introduction, definitions, forming ODE's, methods of solution of first order and first degree ODE's: separation of variables, homogeneous ODE's, ODE's with linear coefficients, 1st order linear ODE's, ODE's reducible to linear ODE's, exact ODE's, the integrating factor, nth order ODE's with constant coefficients: Definition and general properties, 2nd order homogeneous ODE's with constant coefficients, nth order ODE's with constant coefficients, nth order non-homogeneous ODE's with constant coefficients, ODE's with variable coefficients reducible to ODE's with constant coefficients, other methods for finding the particular solution of non-homogeneous ODE's, order reduction for ODE's, method of variation of parameters, method of undetermined coefficients, simultaneous ODE's, series solution of ODE's: First order ODE's, 2nd order ODE's .

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Chm 298	**Chemistry of Ore Analysis**	**2 CH**

Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
1	-	2	
Required SWL		Equivalent ECTS	

Course Content

A Brief Introduction about Ores, Minerals and Rocks - General Principles of Analysis /-Statistical Treatment of Analytical Data - Management of Laboratory and Safety - The Alkali Metals - Aluminum Ores / Arsenic Ores / Barium Ores / Beryllium Ores / Boron Minerals / Cadmium Ores / Calcium and Magnesium Minerals / Chromium Ores / Cobalt Ores / Copper Ores / Gold Bearing Ores / Iron Ores / Lead Ores / Manganese Ores / Mercury Ores / Nickel Ores / Phosphorous Minerals / Selenium and Tellurium Minerals / Silicon and Siliceous Materials / Silver Ores / Sulphur Ores / Tin Ores / Titanium Ores / Tungsten Ores / Zinc Ores / Zirconium Ores.References:

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Engineering and Environmental Geology

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	40%		10%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

محتوى المقررات الاختياريه والاجباريه لمتطلب الجامعه
المستوى الثانى (الاختياريه)

Uni 209	Climatic changes	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content
توصيف المبادئ الأساسية للتغيرات المناخية. التعرف على التغيرات المناخية التي حدثت في الماضي. تحديد المؤشرات الدالة على حدوث التغيرات المناخية. شرح تأثيرات التغيرات المناخية على الأنظمة الطبيعية الموجودة في كل من اليابسة والمحيطات والغلاف الحيوى.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Engineering and Environmental Geology

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☒ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Uni 211	History of Ancient Egypt		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	0	
Required SWL		Equivalent ECTS	
Course Content			

دراسة تاريخ مصر منذ عصر ما قبل الكتابة حتى نهاية العصر القديم، والمصادر التى يستقى منها المادة العلمية وطبيعتها، وأصل المصريين، فترة ما قبل الأسرات، والدولة القديمة و الانتقال الاول، والدولة الوسطى والانتقال الثانى، والدولة الحديثة. عصر الأسرات المتأخرة حتى الفتح المقدونى، والنظام السياسى والادارى فى مصر، ومظاهر الحضارة المصرية، وحالة مصر الاقتصادية والاجتماعية، والديانة المصرية القديمة.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Uni 212	Psychology and Sociology		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	0	
Required SWL		Equivalent ECTS	
Course Content			

تعريف غير المتخصصين فى علم النفس بمدى الاستفادة منه فى تفسير بعض الظواهر الفلسفية، والتعريف بطبيعة علم النفس وأهم أهدافه ومجالاته. دراسة بعض العمليات العقلية العليا كالانتباه والادراك، والتعلم والتذكر، ودراسة الشخصية الانسانيه، ودراسة الانفعالات. استيعاب أهم المفاهيم والنظريات ذات الصلة بموضوعات علم النفس الاجتماعى، وفهم أسس التفاعل الاجتماعى بين الافراد، والوقوف على محدداته وآثاره، وتوظيف المعرفة فى مجال علم النفس الاجتماعى فى المجالات التطبيقية، وتنمية مهارات البحث المكتبى والميدانى المتصلة بموضوعات المادة. دراسة موضوع علم الاجتماع، وأهم المصطلحات السوسيولوجية، ومناهج البحث فى علم الاجتماع، والتنمية البشرية، والثقافة. دراسة الفروع السوسيولوجية: علم اجتماع التنمية، وعلم الاجتماع الريفى وعلم الاجتماع الطبى.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights			
Student	Midterm (MT)	Practical / Oral Exam (PE)	Final (FE)

Activities (SA)	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Uni 213	History and Philosophy of Science	2 CH

Prerequisites	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

التعرف على تاريخ العلم فى الحضارة الاسلامية، والتعرف على دور العرب فى تطوير العلم، واستكمال الوعى بمكونات هويتنا الحضارية. دراسة ماهية العلم العربى، والاطار الحضارى للعلم العربى، والاسس المنهجية لدراسة العلم العربى، وترجمة التراث الاجنبى إلى اللغة العربية. أهم العلماء)جابر بن حيان – والرازى – وابن سينا – وابن الهيثم(. دراسة مدخل إلى فلسفة العلم)الفلسفة، والفلسفة العلمية، وفلسفة العلم(، ودلالات العلم) البحث والتطبيق، والمنهج والمحتوى المعرفى، والعلم واللاعلم(. العلم فى المجتمع والتاريخ.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Engineering and Environmental Geology
Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Uni 214	Ethics of Scientific Research	2 CH

Prerequisites	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

المبادئ الاساسيه لاخلاقيات البحث العلمى. شروط البحث العلمى. المعاٌيير المنهجية للبحث العلمى. حقوق الملكية الفكرية. التشريعات المصرية فى مجال حماية حقوق الملكية الفكرية. اليات نشر وتطبيق اخلاقيات البحث العلمى. اخلاقيات الاقتباس.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Engineering and Environmental Geology
Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Uni 215	Laboratory Safety	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

مصادر الخطوره في المختبرات (المخاطر الطبيعيه – المخاطر الكيميائيه- الأشعه- المخاطر البيولوجيه) السلامه والوقايه الشخصيه الاسعافات الاوليه وترتيبات المعمل التخلص من النفايات المعمليه ، السلامه في الدراسات الحقليه.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Engineering and Environmental Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Uni 216	Skills of Scientific Research	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

مفهوم البحث العلمى، اسس البحث العلمى، مناهج البحث العلمى، أنواع البحث العلمى، صفات الباحث المتميز، مهارات البحث العلمى، خطوات البحث العلمى، تحديد الهدف من البحث، اختيار الموضوع والقراءة حوله، تحرير عنوان البحث، وضع الخطة المنهجيه للبحث واعتمادها من جهات الاختصا ص وأصول الاقتباس والترجمة.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Engineering and Environmental Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable	☐ GOAL 8: Decent Work	☐ GOAL 9: Industry,	☐ GOAL 10: Reduced	☐ GOAL 11: Sustainable	☐ GOAL 12: Responsible

and Clean Energy	and Economic Growth	Innovation and Infrastructure	Inequality	Cities and Communities	Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Uni 210	Innovation and entrepreneurship	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

This course deals with the study of leadership behavior and its importance in building the personality in the institutions and society and knowing the relationship between the leadership and innovation. It also includes a detailed discussion of the personal characteristics of innovators, factors of innovation success and developing the administrative processes, knowing the criteria for building and developing the innovative behavior and practical cases and applications in leadership and management of innovation.

Taught in Program(s)

As major in Program(s) Code(s)

Geology

As minor in Program(s) Code(s)

Engineering and Environmental Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Uni 218	History of Modern Egypt	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

معرفة أوضاع المجتمع المصرى فى العصر العثمانى، والحملة الفرنسية وآثارها المختلفة على الصعيدين الخارجى والداخلى .
مشروع التحديث فى عصر محمد على، وموقف القوى الخارجية من ازدياد النفوذ الاجنبى فى مصر، والاحتلال البريطانى لها. دراسة المجتمع المصرى فى العصر العثمانى، والحملة الفرنسية والمجتمع المصرى .الفوضى السياسية فى مطلع القرن19 ،ومحمد على وتجربة التحديث. مظاهر النفوذ الاجنبى فى مصر فى النصف الثانى من القرن 19 ،والثورة العرابيّة والاحتلال البريطاني.

Taught in Program(s)

As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Uni 219	Environmental Culture		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	0	
Required SWL		Equivalent ECTS	
Course Content			
الاطلاع على أحوال البيئة العالمية، والتعرف على المتغيرات البيئيه الاساسيه، والتعرف على مظاهر التلوث وأنماطه، والتوجيه إلى حماية البيئة فى الاغلفه الاربعـة، و بيان السبب فى دراسة البيئة.			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Uni 220	Philosophy and Critical Thinking		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	0	
Required SWL		Equivalent ECTS	
Course Content			

يحدد موضع التفكير النقدي بين صور التفكير الانساني ومستويات هو أنماطه المختلفة- .يعرف ماهية التفكير النقدي ومهاراته المختلفة- .يكتشف الاخطاء الشائعة في التفكير - يميز بين أنماط التفكير الصحيحة وغير الصحيحة- .يطبق مهارات التفكير النقدي في المواقف الحياتية المختلفة- .يوظف التفكير النقدي والمنطقي في حل المشكلات، واتخاذ القرارات المتنوعة- يُبني الحجج المنطقية، ويفسرها، ويقيمها- .يكتشف مدى صدق وصحة الحجج، وجوانب القوة والضعف فيها- .يحلل الحجج الاستنباطُية والاستقرائيه وينتقدها.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Uni 221	Communication Skills		2 CH
Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	0	
Required SWL		Equivalent ECTS	
Course Content			

يقدم المقرر مهارات أساسية في الكتابة والتواصل الشخصي مع الآخرين للأغراض العلمية والعملية مما يمكّن الطالب من تقديم ذاته والتعبير بشكل فعال عما يريد إيصاله من معلومات وأفكار وكذلك التعامل مع المعلومات التي يقدمها الغير. - فهم معنى السيرة الذاتية ومعرفة دورها وأهميتها وكيفية توظيفها للتقدم إلى فرصة ما. - معرفة دور رسالة الإرفاق وتكاملها مع السيرة الذاتية، والاستعداد للمقابلة الشخصية. - فهم معنى الاستطلاع أو المسح الاستبياني ومعرفة دوره وأهميته وكيفية توظيف نتائجه. - تصميم الاستبيان وإجراء المسح الاستبياني وتفريغ نتائجه. - معرفة معنى البحث العلمي وكيفية إجرائه. - كيفية تقديم نتائج البحث العلمي في تقرير احترافي. - معرفة أنواع التواصل المباشر وفهم معنى المحاضرة وخصوصيتها. - تصميم مادة محاضرة ومعرفة كيفية إلقائها والاستعداد لذلك وإدارة النقاش خلالها.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Uni 222	Fitness	2 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0
Required SWL	Equivalent ECTS	
Course Content		
يركز مقرر الصحه واللياقه على الجانب المتعلق بمهارات تطوير الذات من الناحية الصحية والجسدية، وما يرتبط بها من مهارات تتعلق بالصحة الشخصية والغذائية والرياضية والوقائية والنفسية والإنجابية والإسعافات الأولية، مع التركيز على المواقف الحياتية، بهدف إثارة دافعية الطلاب وتشويقهم لعملية التعلم من خلال الإطار العام للمقرر ومعاييره وضوابطه. أما عن وصف اللياقة البدنية فيتمثل دورها بممارسة التمرينات البدنية للمحافظه على الصحة باستخدام الأجهزة الحديثة والتعلم بالترفيه وممارسة بعض الأنشطة الرياضية .		

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Uni 223	Biodiversity Conservation and Sustainability	2 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0
Required SWL	Equivalent ECTS	
Course Content		
Introduce students in an integrative manner to the field of biodiversity conservation and how to apply its principles to best promote sustainability. Understanding biodiversity and its management requires an interdisciplinary approach with particular reference to mechanisms of change and human impacts on the environment. This course will be interdisciplinary in its approach.		

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	
Assessment Weights					

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Uni 224	Political Science and International Relations	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	0

Required SWL		Equivalent ECTS	

Course Content

تتناول هذه المادة ماهية و مفاهيم، علم العلاقات الدولية والذي يعد المجتمع الدولي مادته، وعلاقة علم العلاقات الدولية بباقي العلوم الاجتماعية الأخرى، وصولاً لتحديد ماهية الشخص الدولي كمدخل للوقوف على تعدد أشخاص هذا المجتمع، وتفسيرهم من خلال مجموعة معايير ذات الدلالة بقصد تحديد مكانة ودور كل منهم على الساحة وأطراف العلاقات الدولية و المناهج المعاصرة في دراسة العلاقات الدولية بالإضافة الى مدارس العلاقات السياسية الدولية كما يتم تناول مبادئ العلاقات الدولية والعوامل المؤثرة فيها و تطور العلاقات الدولية بين الحربين العالميتين خلال الحرب العالمية الثانية و العلاقات السياسية الدولية في عصر الامم المتحدة وفي ظل الحرب الباردة وانعكاساتها على العلاقات السياسية الدولية بالإضافة للعلاقات الدولية في ظل العولمة.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Engineering and Environmental Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Third Level (Junior year) - Courses of Engineering and Environmental Geology program

Geo 301	Engineering Geophysics	3 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory

2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Introduction–study of stratigraphic units and structural phenomena - mapping salt bodies - determining solid layers and intersections - mapping freezing zones - assessing conditions for engineering and subsurface work - assessment of construction sites of dams and reservoirs - excavation of antiquities - studies of mining and their follow-up - exploration of caves and sinkholes - exploration and identification of buried metal vessels and equipment - assessment of ground water reservoirs - landfills studies - monitoring of pollution and emissions from drainage areas.
Engineering Geophysics is an application of geophysical methods to the investigation of near surface physico-chemical phenomena which are likely to have (significant) for the management of the local environment.

Taught in Program(s)

As major in Program(s) Code(s)

Geology

As minor in Program(s) Code(s)

Engineering and Environmental Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☒ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsibl Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 303	Advanced Engineering and environmental geology Microscopy	3 CH

Prerequisites

Number of weekly Contact Hours

Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Role of Engineering Geology in Engineering projects, Rocks in Engineering Construction, Engineering Problems in different rocks (Basement, Sedimentary Rocks as Shale and Limestone), Earthquakes and their effect on rocks and engineering constructions, Treatment the effect of earthquakes on the engineering constructions and cities, Geotechnical investigations for general E. constructions, Geotechnical investigations for Dams, Tunnels, Roads, Rail away, Bridges, and airports. Water and Environment (Pollution, Management and treatment), Waste (Management, treatment, reuse and recycling), Effect of mines on the Environment, Geological factors and the environmental health, Trace elements and Health, mineral resources and the environment, Sites Evaluation, Environmental Law.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsibl Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 305	**Special course in engineering geology**	**2 CH**

Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	-	
Required SWL	-	Equivalent ECTS	-

Course Content

Engineering Geological topics chosen by the Department Council.

Taught in Program(s)
As major in Program(s) Code(s)

Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsibl Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 307	Structural analysis	3 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Stereographic projection, foliation, joints, lineation, minor folds, mechanism of faulting and folding, gravity-controlled structures, geotectonic (continental drift, plate tectonics), deformation mechanism.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsibl Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	
Assessment Weights					

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 309	Sedimentary rocks	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Sedimentary Rocks: Introduction – Textures- Sedimentary structures - mineral composition – Provenance, Classification of sedimentary rocks and their diagenesis. Conglomerates and breccias, sandstone, shale and argillites, limestone and dolomites, non-clastic sediments.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Engineering and Environmental Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 311	Quaternary geology	2 CH

Prerequisites	

Number of weekly Contact Hours

Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Introduction, Definitions, Quaternary time, Stratigraphic classification of Quaternary, Types of Sediments, Types of Environments, Applied, Engineering, and Economic Importance of Quaternary Deposits.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Engineering and Environmental Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 313	Diagenesis	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Introduction - main diagenetic processes in sedimentary rocks (Sandstone, Clay, Carbonates - evaporates) - Meteoric diagenesis in carbonate rocks - Calcite spar, Neomorphism and Compaction in L.St.-Dolomitization and carbonate sediments- Effect of diagenesis on porosity & permeability of the sediments.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Mat 321	Numerical analysis	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Errors and Computer Computations-Solution of nonlinear equations-Direct and iterative methods for linear system of equations-Interpolation-Approximation with polynomials-Numerical Differentiation-Numerical Integration

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 302	Rock mechanics	3 CH
Prerequisites		

Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	-	Equivalent ECTS	-

Course Content
Introduction, Definitions, Rocks and Rock Masses, Forces and Stress – Strain, Mechanical Behavior and Engineering classification of rocks and rock Masses, Influential Factors on types of rocks deformations, Effects of joints and weakness planes on the mechanical behavior of rocks and rock Masses, Mechanical properties of Rocks and rock Masses (Compression, Shear and tension strength), Index Properties of Rocks and rock Masses (Permeability, Porosity, Density, Ultrasonic Velocity, …) .

Taught in Program(s)
As major in Program(s) Code(s)
Geology

As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 304	**Soil mechanics**	**3 CH**
Prerequisites		

Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	2	
Required SWL	-	Equivalent ECTS	-

Course Content

Introduction, Definitions, Principals concepts, Tri-System of soil, Texture and Structure of soil, physical properties of soil, Grain size distribution of soil, Soil Filter, Soil Limits and Kasagranda Test, Engineering soil classification, Soil compaction and Proctor Test, Soil Stresses, compression and shear strength, Soil Bearing and CBR-Test, Porosity and Permeability of soil, Soil Consolidation and compressibility coefficient, Horizontal Earth Pressure, Soil Settlement, Problems of soil foundations, Introduction in problematic soil .

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible

	Growth				Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 306	Special course in Environmental geology	2 CH

Prerequisites	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	-

Required SWL	-	Equivalent ECTS	-

Course Content
Environmental Geological topics chosen by the Department Council

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Engineering and Environmental Geology

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 308	Advanced Hydrogeology	3 CH

Prerequisites	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Introduction to applied hydrogeology; science and technology, Homogeneity / heterogeneity, isotropy/anisotropy, Flow in secondary porosity and fracture flow systems, Well technology, Drilling methods, Production wells, observation and monitoring wells, Well construction design, casing and screens, Aquifer tests: pumping, slug and tracer tests (Field trip), Interpretation of the results and computer software, Groundwater modeling, Current and future trends in hydrogeology.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 310	Photogeology and remote sensing	2 CH

Prerequisites	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory

1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Concepts of remote sensing, aerial photography, (elements, air photo interpretation (instrumentation and procedures), principles of landform identification and evaluation, applications of aerial photographs in geology), earth resources satellites, multispectral scanners, digital image processing, applications of remote sensing and geographic information systems in geology.

Taught in Program(s)

As major in Program(s) Code(s)

Geology

As minor in Program(s) Code(s)

Engineering and Environmental Geology

Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 312 Mining geology 2 CH

Prerequisites

Number of weekly Contact Hours

Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Mining Geology: Historical Perspective - Mineral deposits in the subsurface environment – Mineral deposits in the zone of weathering - Metallogenic processes and provinces - The engineering factors and approaches to Mining – Surface mining methods – Underground mining methods – Support of mining excavations and safety methods.

Taught in Program(s)

As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 314	Sequence stratigraphy and sedimentary basin	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Sequence Stratigraphy: Analysis of siliciclastic and carbonate sediments and the effect of global sea-level changes. Sedimentary basin: Introduction – Principles of Basin Analysis - Development of basin analysis – Types and classification of sedimentary basins.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and

					Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 316	Sedimentary Basins Modeling	2 CH

Prerequisites	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content
Sedimentary basin: Introduction – Principles of Basin Analysis - Development of basin analysis – Types and classification of sedimentary basins. Sedimentary basins and their hydrocarbon filling - basin modeling – Correlation and areas of origin and development - oil forecasting and exploration - risk analysis and economics - reserve calculation and development plans.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Engineering and Environmental Geology

Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Chm 318G	Electro-chemistry	2 CH

Prerequisites	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content
Introduction- Single electrode potential- standard electrode- The electrochemical motive series of elements-Evolution of hydrogen from molar acidic solution- Reversible and irreversible cells- Nernest equation-Concentration cell- Cells of amalgam electrodes- References electrode- electro motive force measurements- Application of electro motive force- electrolysis and polarization

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Chm 320G	Water analysis	2 CH

Prerequisites	

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-
Course Content			
Polar nature of water-Cycling of water and residence time- Analytical method- Equilibrium constant expressions- Chemical reaction equation and Arrenhius and Bronsted-Lowry acids and bases- Ionization constant reactions and expressions- Acids and bases- Measuring pH- Filtration- Alkalinity- Buffering capacity of water - Water quality and water treatment			

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☒ GOAL 11: Sustainable Cities and Communities	☒ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Fourth Level (Senior year) - Courses of Engineering and Environmental Geology program

Geo 401	Engineering and environmental geology in Egypt	2 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2
Required SWL	-	Equivalent ECTS	-
Course Content			
Engineering geological studies in Egypt – Environmental geological studies in Egypt – Case Histories. Provide solutions for economic and social activities in Egypt aligned with the sustainable			

development. Geological and geotechnical analysis, and design associated with human development and various types of structures in Egypt.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 403	Slope stability and in situ testing	3 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Soil slopes, excavations, and cut slopes- Slope failures, movements, and processes- Triggering mechanism- Fundamental of shear strength- Measurements of strength- Laboratory testing and standards-Importance of water and pore pressure in slope stability- Soil permeability- Slope stability analysis methods-Porewater pressure- Mechanics of limit equilibrium .

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 405	Engineering of Dams and reservoirs	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Fundamental of Dams and reservoirs Engineering. The Regional Approach to Select Proper Sites for Dams and Reservoirs. Methods to Determine the Permeability of Dam Foundation and Reservoirs. Modeling of Dams and reservoirs. Leakage from Reservoirs – A Common Problem in constructing Dams and reservoirs. Engineering and the Environmental Impacts of Dams and Reservoirs.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)

Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 407	Subsurface geology	3 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Source of subsurface data, Well-site geologist, drilling methods, drilling operations, analysis of well rock samples and fluids, presentation of subsurface data, subsurface map-reading and interpretation, writing a geologic subsurface report, subsurface correlation, subsurface stratigraphy and structures, subsurface geology of Egypt.

Taught in Program(s)
As major in Program(s) Code(s)

Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 400	Scientific Research Course مقرر البحث العلمي	3 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Study of a problem applicable in Engineering and Environmental Geology science to application of geology in industry, earth science and other related topics to geology. Study of a problem applicable to the petroleum industry. It is an extended, independent, self-directed, piece of practical work integrating and reinforcing the material taught on the course, and giving a detailed insight into the demands and ways of working in the hydrocarbon industry. Geo-environmental hazards risk and analysis, environmental pollution (water, air, soil).

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☐ Exam
100%	-		-		-	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
50%	0%	50%	-

Geo 499	Field training	3 CH
Prerequisites		

Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
-	-	-	
Required SWL	-	Equivalent ECTS	-

Course Content

Planning a field project in Engineering and Environmental Geology projects, field equipments and tools, safety, field notebook, field observations, sedimentary rocks, field relations, igneous rocks field relations, metamorphic rocks field relations, preparation of field reports, training on mapping, compass survey. Relationship to other geological disciplines, mapping and projection methods, compass, clinometer, strike measurements, presentation of data, plane table description and theory, theodolites description and theory, advantages and disadvantages, GPS description, uses, resolution and controls. Writing a geological report.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☐ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☐ Assessment	☐ Exam	☐ Practical Exam	☐ Oral Exam	☐ Assessment	☐ Exam
100%	-		-		-	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
50%	0%	50%	-

Sta 409	Geostatic	2 CH
Prerequisites		

Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
2	-	-	
Required SWL	-	Equivalent ECTS	-

Course Content

Introduction - Statistical Inference - Population - Sample - Parameters - Sampling Distribution - Variance& Covariance - Basic Statistic - Univariate Statistic - Multivariate Statistic: Factor analysis - Principal component analysis (PCA) - Two groups discriminate function analysis (TGDFA) - Cluster analysis - Application of some Computer programs and software in Geology (graphs, Mapping, Modeling, image analysis).

Taught in Program(s)
As major in Program(s) Code(s)

Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☐ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	30%		10%		60%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 409	Environmental geochemistry	2 CH

Prerequisites			
Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
1	-	2	
Required SWL	-	Equivalent ECTS	-

Course Content

Geochemistry of igneous rocks: Geochemistry of the Core, the Mantle, and the Crust- Physical and chemical methods of sample treatment - Chemical methods of analyses (conventional and new methods) - Distribution of elements in the different rock units -the relation between geochemistry, environmental and human health. Geochemistry of Sedimentary Rocks: Meteorites and geochemistry - Geochemical structure of the Earth - Geochemical classification of the elements - Geochemistry of REE - Chemical weathering and formation of sediments - Geochemical classification of sediments and of their derivatives - Geochemical factors controlling the distribution of trace elements in sediments - Geochemistry of biosphere – Geochemistry of Island Arcs, hot spots, MORR, the Moon, Mars – Isotopic applications in geochemistry.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam

-	20%	30%	50%

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 411	Hydrogeochemistry	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Physical properties and chemical composition of groundwater, chemical analysis of water, geologic source of major and trace elements in groundwater, groundwater types according to chemical analysis of water, origin and genesis of groundwater, groundwater quality, suitability of groundwater for different uses.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 413	Geological hazards	2 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Geologic hazards (earthquakes, volcanoes, mass movements, floods, subsidence), desertification, pollution (water, soil and air), medical geology, land use planning, engineering geology. Geo-environmental hazards risk and analysis, environmental pollution. Natural hazards, environmental

hazards, waste management (solid, liquid and radioactive), land use planning and engineering geology.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 404	Environmental Geophysics	3 CH
Prerequisites		

Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2

Required SWL	-	Equivalent ECTS	-

Course Content

Introduction–study of stratigraphic units and structural phenomena - mapping salt bodies - determining solid layers and intersections - mapping freezing zones - assessing conditions for engineering and subsurface work - assessment of construction sites of dams and reservoirs - excavation of antiquities - studies of mining and their follow-up - exploration of caves and sinkholes - exploration and identification of buried metal vessels and equipment - assessment of ground water reservoirs - landfills studies - monitoring of pollution and emissions from drainage areas.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	
Assessment Weights					

Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)		
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam	
-	20%		30%		50%		
Student Activities Breakdown (Distribution for Study Blocks)							
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)		
-	-		-		-		

Geo 406	Building materials	3 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
2	-	2
Required SWL	-	Equivalent ECTS -
Course Content		
Building Materials: Definitions, Types of building materials, Soil as building materials, Rocks as building materials, Physical and mechanical properties of different building materials, Standards and tests to evaluate different building materials, Occurrence and Distribution of building materials in Egypt. Mechanical properties of soil and rocks which use in different Asphalt and Concrete Mixtures, Standards and tests to evaluate different Asphalt and Concrete Mixtures.		

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights							
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)		
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam	
-	20%		30%		50%		
Student Activities Breakdown (Distribution for Study Blocks)							
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)		
-	-		-		-		

Geo 408	Economic geology	2 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2
Required SWL	-	Equivalent ECTS -
Course Content		
General terms and classification of mineral deposits of Egypt- Factors affecting ore mineability- Ore deposits-endogenetic forming processes- Ore deposits-exogenetic forming processes- Ore		

deposits for the structural industries in Egypt- Ore deposits for the transformational industries in Egypt- Ore deposits for energy generation in Egypt- Basement rocks from an economic perspective.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 410	Well logging	2 CH
Prerequisites		

Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
1	-	2	
Required SWL	-	Equivalent ECTS	-

Course Content

Objectives, expectations, grading policy and road map, core data and coring operation – well logging applications - Principles, tools, measurements, corrections and normalization of well log data -Graphical display of data - Temperature and caliper logs - Spontaneous potential (SP) andresistivity logging - Natural and spectral gamma ray logs - Density and Neutron logs - Sonic logging.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights			
Student	Midterm (MT)	Practical / Oral Exam (PE)	Final (FE)

Activities (SA)	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
-	-		-		-	

Geo 412	Geology of Egypt	2 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2
Required SWL	-	Equivalent ECTS -
Course Content		

Phanerozoic: Morphologic classification of Egypt – Structural framework – Details of the Stratigraphic Sequence In Egypt – Regional Distribution, paleoenvironments, litho- and biostratigraphy of the Paleozoic, Mesozoic and Cainozoic deposits in Egypt – Paleogeography and evolution of paleobasins with special reference to the evolution of the Nile Delta, Gulf of Suez and Red Sea - Geology of selected areas: in the Western Desert; Nile Valley; Eastern Desrt; Gulf of Suez, etc .Basement Rocks in Egypt; Evolution & Main features; Island arc stage; Metavolcanic and associated volcaniclastics; Cordillera stage; Granites; Dokhanvolcanics - Katherina Volcanics.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☐ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	
Student Activities Breakdown (Distribution for Study Blocks)						
Seminar-based (SB)	Self-learning-based (SL)		Project-based (PB)		Industry-based (IB)	
-	-		-		-	

Geo 414	Hydrogeology of Egypt	2 CH
Prerequisites		
Number of weekly Contact Hours		
Lecture	Tutorial	Laboratory
1	-	2
Required SWL	-	Equivalent ECTS -
Course Content		

River Nile, Groundwater aquifers in Egypt, Rainfall and runoff water in Egypt (Hydrogeological modeling and runoff simulation, distributions), Seawater desalination. Water scarcity - Groundwater depletion - Groundwater Development, Sustainability, and Water Budgets - The Earth's Water Budget - Effects of Groundwater Development on Groundwater Flow to and from Surface Water Bodies. Effects of Human Activities on the Interaction of Groundwater and Surface Water in Egypt. The climate change impact of the rainfall precipitation. Surface rainfall-runoff processes for large water drainage basins or watersheds in Egypt. Future Policies for the Development of Water Resources.

Taught in Program(s)					
As major in Program(s) Code(s)					
Geology					
As minor in Program(s) Code(s)					
Engineering and Environmental Geology					
Targeted Sustainable Development Goals					
☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		50%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

Geo 416	Archeogeophysics	2 CH
Prerequisites		

Number of weekly Contact Hours			
Lecture	Tutorial	Laboratory	
1	-	2	
Required SWL	-	Equivalent ECTS	-

Course Content

An introduction to the geophysical methods used in the field of archeology - the use of geophysical surveys in the excavation and evaluation of archaeological sites - design of the survey plan and conducting field measurements - correcting and processing data, preparing and interpreting geophysical maps -developing an appropriate plan for excavation work, determining the tools used in drilling and collecting samples, writing reports for future works and excavations - Studying the groundwater level and developing appropriate solutions in the case of raising the level.

Taught in Program(s)
As major in Program(s) Code(s)
Geology
As minor in Program(s) Code(s)
Engineering and Environmental Geology
Targeted Sustainable Development Goals

☐ GOAL 1: No Poverty	☐ GOAL 2: Zero Hunger	☐ GOAL 3: Good Health and Well-being	☒ GOAL 4: Quality Education	☐ GOAL 5: Gender Equality	☐ GOAL 6: Clean Water and Sanitation
☐ GOAL 7: Affordable and Clean Energy	☐ GOAL 8: Decent Work and Economic Growth	☐ GOAL 9: Industry, Innovation and Infrastructure	☐ GOAL 10: Reduced Inequality	☐ GOAL 11: Sustainable Cities and Communities	☐ GOAL 12: Responsible Consumption and Production
☐ GOAL 13: Climate Action	☐ GOAL 14: Life Below Water	☒ GOAL 15: Life on Land	☐ GOAL 16: Peace and Justice Strong Institutions	☐ GOAL 17: Partnerships to achieve the Goal	

Assessment Weights						
Student Activities (SA)	Midterm (MT)		Practical / Oral Exam (PE)		Final (FE)	
	☒ Assessment	☒ Exam	☒ Practical Exam	☒ Oral Exam	☐ Assessment	☒ Exam
-	20%		30%		**50**%	

Student Activities Breakdown (Distribution for Study Blocks)			
Seminar-based (SB)	Self-learning-based (SL)	Project-based (PB)	Industry-based (IB)
-	-	-	-

ملحق (٦)

يتم حساب المعدل التراكمي لطلاب محولين لبرنامج يعمل بنظام الساعات المعتمدة، بناء على ما درسه الطالب من مقررات تحت مظلة هذا البرنامج فقط، ولا يعتد بما درسه في أي برنامج بنظام الساعات المعتمدة في أي جامعة أخرى أو نظام الفصلين الدراسيين سواء بجامعته أو أي جامعة أخرى. وفى جميع الأحوال يتم اجراء مقاصة لما درسه ليتم حسابه ضمن متطلبات الحصول على الدرجة دون احتسابها في حساب المعدل التراكمي للطالب.

التقديرات المكافئة عند التحويل من النظام الفصلي إلى نظام الساعات المعتمدة

من النظام الفصلي	إلى نظام الساعات المعتمدة	
النسبة المئوية للدرجة	عدد النقاط	التقدير
أكثر من 95%	4.0	A+
90% إلى أقل من 95%		A
85% إلى أقل من 90%	3.7	A-
80% إلى أقل من 85%	3.3	B+
75% إلى أقل من 80%	3.0	B
71% إلى أقل من 75%	2.7	B-
68% إلى أقل من 71%	2.3	C+
65% إلى أقل من 68%	2.0	C
60% إلى أقل من 65%	1.7	C-
55% إلى أقل من 60%	1.3	D+
50% إلى أقل من 55%	1.0	D
أقل من 50%	0.0	F