اللائحة الدراسية الموحدة لمرحلة البكالوريوس

بنظام الساعات المعتمدة

كليةالهندسة—جامعةالزقازيق

٢٠٢٠

المحتويات

مادة (١): رسالة ورؤية وأهداف الكلية:

- **رسالة الكلية**

تنصب رسالة كلية الهندسة بجامعة الزقازيق فى الحفاظ على مستوى أكاديمى وهندسي عاليين وسلوك مهنى قويم والتزام أخلاقى لخريجها . وفي إطار تحقيق رسالتها ، فإن الكلية تعمل بشكل دؤوب ومنذ نشأتها لتصبح إحدي المؤسسات الأكاديمية المتميزة في مجالات التعليم والبحث العلمي الهندسي وخدمة المجتمع المحيط بشكل خاص والمجتمع الأوسع بشكل عام . وفي هذا الإطار أيضا ، فقد عملت الكلية دوما علي تطوير لائحتها الدراسية الداخلية وعناصرالعملية التعليمية (أعضاء هيئة التدريس ومعاونيهم والمختبرات والمكتبة) لمرحلة البكالوريوس والدراسات العليا كذلك، بالاضافة إلي إدخال الوسائل التكنولوجية الحديثة والميكنة في الجهازين التعليمي والإداري ونظم الإمتحانات وإظهار النتائج.

- **رؤية الكلية**

تتحدد الرؤية العامة للكلية في أنه لا سبيل الي إرتقاء أي مجتمع ، ومجتمعنا المصري بصفة خاصة ، إلا من خلال منظومة تعليمية وبحثية رصينة ترتكز علي دعائم قوية من الأخلاقيات المهنية وتواكب التطور العلمي والتكنولوجي الذي لا يتوقف ، وأن هذا هو السبيل الأوثق الي بلوغ درجات متقدمة في مصاف الأمم العظيمة .

- **أهداف الكلية**

تهدف الكلية إلى المساهمة في دفع عجلة التنمية في مجال المهن الهندسية والتطبيقات التقنية في مصر وتصبو الكلية إلي تحقيق التميز المهني لخريجيها وذلك بالأخذ بأسباب التطوير المستمر للعملية التعليمية من حيث البرامج الدراسية وتحديث المعامل وتجهيزها ورفع مستوي أعضاء هيئة التدريس وتدريبهم علي إتباع طرق التدريس والتقويم الحديثة وإستخدام الوسائل التعليمية بجانب إجرائهم أبحاثا علمية عالية المستوي. ولأهمية متابعة الكلية للتطورات العالمية في التدريس، فقد أدخلت الكلية برامج دراسية جديدة تعمل بنظام الساعات المعتمدة وتستخدم أساليب تدريس وتقييم جديدة ومتطورة وشراكة مع جامعات أجنبية متميزة للعمل علي رفع تنافسية الخريجين عالميا ورفع جودة التعليم الهندسي.

ومن هنا تتحدد أهداف الكلية فيما يلي:

١- إعداد خريجين متخصصين في مجالات العلوم الهندسية والتطبيقات العملية والتقنية بهدف خدمة المجتمع كلا في اطار تخصصه.

٢- تطوير البحث العلمى والدراسات العليا بما يتفق مع خطط الدولة ويحقق تطوير المجتمع وحل مشكلاته.

٣- المساهمة في التخطيط للمستقبل عن طريق المشاركة في وضع إستراتيجيات التنمية والدفع الى تطوير لائحة الجامعة وتطوير نظم إدارة الكلية وأقسامها الاكاديمية والادارية.

٤- وضع آليات التطوير المستمر للبرامج التعليمية وتقويم الاداء.

٥- إنشاء برامج جديدة بنظام الساعات المعتمدة والتركيز على تخصصات جديدة ومتطورة لتخريج مهندس متميز في مختلف المجالات طبقا لاحتياجات الدولة والسوق المحلي والعربي والعالمي.

٦- الدفع إلى تدريس المقررات بنظام التعليم الإليكتروني والتعليم عن بعد واستخدام الوسائط المتعددة في العرض والتقييم.

٧- الإسهام فى التنمية المستدامة للمجتمع وتقديم الخدمات البحثية والإستشارية لقطاعات الصناعة والبناء لتطوير المجتمع.

٨- تم مراعاة قواعد الهيئة القومية لضمان جودة التعليم والاعتماد NARS2018 في تحديث اللائحة و هو مايتضح في أهداف ورسالة ورؤية الكلية وينعكس علي أهداف و محتويات المقررات الدراسية بحزم البرامج الدراسية المختلفة.

مادة (2):

- تمنح جامعة الزقازيق بناءً على طلب كلية الهندسة درجة البكالوريوس فى أحد التخصصات الهندسية بنظام الساعات المعتمدة الآتية:

١- الهندسة المدنية- برنامج هندسة الإنشاءات وإدارة التشييد
(طبقاً للقرار الوزاري رقم (٢٣٣٦) بتاريخ ٢٠٠٧/٨/٢٩).

٢- الهندسة الميكانيكية- برنامج هندسة الميكاترونيات
(طبقاً للقرار الوزاري رقم(٣٨١٢) بتاريخ ٢٠١٣/١٠/٢).

٣- الهندسة الميكانيكية- برنامج هندسة الطيران والمركبات الفضائية
(طبقاً للقرار الوزاري رقم (٢٤٠٨) بتاريخ ٢٠١٦/٧/٩).

- يتم العمل بهذه اللائحة وذلك بعد صدور القرار التنفيذي بإقرارها وذلك في بداية الفصل الدراسي الأول للعام الجامعي على الطلاب الجدد الملتحقين ببرامج الساعات المعتمدة في ذات العام على ألا يتم تطبيقها بأثر رجعي على الطلاب القدامى بالمستويات الأعلى ببرامج الساعات المعتمدة.

مادة (٣): الأقسام العلمية المشاركة فى تنفيذ برامج الساعات المعتمدة:

يدخل في إختصاص كل قسم من أقسام الكلية التدريس وإجراء البحوث الخاصة بمقررات برامج الساعات المعتمدة طبقا لجدول النظام الكودى للمقررات الدراسية وجداول تفاصيل المقررات الدراسية المرفقة لبرامج الساعات المعتمدة. ويجوز لإدارة البرامج إسناد تدريس أي من المقررات الدراسية لأحد أعضاء هيئة التدريس من أي الأقسام العلمية ذات الصلة بالمحتوي العلمي لهذا المقرر كما يجوز للطالب تسجيل مادتى مشروع التخرج بأي من الأقسام العلمية ذات الصلة الوثيقة بتخصص البرنامج المقيد به الطالب.

مادة (٤): شروط القيد:

- يسمح بالقيد للحاصلين على شهادة الثانوية العامة شعبة رياضيات، أو ما يعادلها، ممن تم توزيعهم عن طريق مكتب التنسيق، أو من المحولين من كليات أخرى طبقا للشروط التى يضعها المجلس الأعلى للجامعات ولا يجوز تجاوز شروط مكتب التنسيق فيما يخص التوزيع أو التحويلات.
- تضع الكلية قواعد عامة للقبول بحيث تكون رغبة الطالب ومبدأ تكافؤ الفرص هي الأساس في قبول طلاب بنظام الدراسة بالساعات المعتمدة.

مادة(٥): نظام الدراسة:

- تعادل درجة البكالوريوس بنظام الساعات المعتمدة مقررات تكافئ ١٦٥ ساعة معتمدة لكل التخصصات الهندسية فى هذه اللائحة ، منها 34 ساعة معتمدة بالمستوى العام (مستوى 000) يدرسها كل الطلاب المقبولين بالبرامج خلال الفصلين الرئيسيين الاولين.
- تحدد الساعات المعتمدة المقابلة لساعات الإتصال لكل مقرر (محاضرة– تمرين – معمل) حسب الجدول التالى:

المحاضرة		التمرين/المعمل	
ساعات إتصال	ساعات معتمدة	ساعات إتصال	ساعات معتمدة
١	١	٢تمرين أو ٣معمل	١
٢	٢	٤تمرين أو ٥معمل	٢

- الدراسة باللغة الإنجليزية، وتضع الكلية نظاماً للتأكد من مستوى الطالب في اللغة الانجليزية.

مادة(٦): مواعيد الدراسة والقيد:

- تقسم السنة الأكاديمية إلى ثلاثة فصول دراسية على النحو التالي:

الفصل الرئيسى الأول (فصل الخريف): يبدأ فى شهر سبتمبر ولمدة لا تقل عن ١٤ أسبوع.

الفصل الرئيسى الثاني(فصل الربيع): يبدأ فى شهر فبراير ولمدة لا تقل عن ١٤ أسبوع.

الفصل الغير رئيسي (فصل الصيف): يبدأ فى أواخر شهر يونيو ولمدة لا تقل عن ٧ أسابيع مكثفة.

- الأسابيع الدراسية الموضحة لا تشمل فترة الامتحانات الدراسية النهائية.
- يتم قيد الطلاب بالبرامج عند بدء أى من الفصلين الدراسيين الرئيسيين فقط ، ويتم تخرج الطلاب عند نهاية أى فصل دراسى بما فى ذلك الفصل الصيفى .

مادة (٧): مدة الدراسة:

- الحد الأدنى لمدة الدراسة للطالب المنتظم أربع سنوات دراسية ونصف.
- الحد الأقصى للدراسة للطالب المنتظم عشر سنوات دراسية ويستثنى من تلك المدة الفصول الدراسية الرئيسية التى يتم فيها إيقاف قيد الطالب لعذر يقبله مجلس الكلية. ويفصل الطالب بعدها.

مادة (٨): رسوم الدراسة:

- يتم تحديد رسوم الخدمة التعليمية المقررة لكل ساعة معتمدة، بمعرفة مجلس الجامعة بناء على إقتراح مجلس الكلية سنويا، ويمكن زيادة هذه الرسوم سنويا على الطلاب الجدد فقط وذلك طبقا للقواعد والاليات التي يقرها مجلس الجامعة. ولا يعتبر تسجيل الطالب فى أى فصل دراسى كاملا إلا بعد إستيفاء شروط القيد وسداد الرسوم المقررة كاملة.

مادة(٩): شروط التسجيل:

- يسمح للطالب الذى يكون متوسط نقاطه التراكمى ٢,٠٠ أو أعلى فى بداية أى من فصلى الخريف أو الربيع التسجيل في مقررات لا تزيد ساعاتها المعتمدة عن ١٨ ساعة معتمدة.
- لا يسمح للطالب المنذر أكاديميا والذى يكون متوسط نقاطه التراكمى أقل من ٢,٠٠ فى بداية أى من فصلى الخريف أو الربيع التسجيل في مقررات تزيد ساعاتها المعتمدة عن ١٤ ساعة معتمدة أو ٥ مقررات دراسية.
- يمكن للطالب التسجيل في الفصل الصيفي في مقررات لا تزيد ساعاتها المعتمدة عن ٦ ساعات أو مقررين دراسيين على الأكثر.
- يجب على الطالب إستيفاء شروط التسجيل في كل مقرر، وبعد استشارة المرشد الأكاديمي، وفي ضوء قواعد التسجيل التي تصدرها الكلية سنويا وتنشر في دليل الطالب ، ولا يعتبر التسجيل نهائيا إلا بعد دفع رسوم الخدمة التعليمية المقررة لكل فصل دراسي.
- تسجيل مقرر مشروع (١) يتطلب إجتياز الطالب ١٢٠ ساعة معتمدة و لا يتم تسجيل مشروع (٢) الا بعد اجتياز مشروع (١).

- يجوز التسجيل للطالب المتأخر عن المواعيد المحددة إذا سمحت الأعداد والأماكن وبعد الحصول على موافقة كتابية من أساتذة المقررات ، ويمكن للكلية أن تقرر رسوم تأخير تسجيل بالإضافة إلى رسوم الخدمة التعليمية المقررة.
- يمكن لمجلس الكلية تعديل قائمة المتطلبات السابقة للمقررات أو تعديل محتوى بعض المقررات فى بداية السنة الدراسية إذا اقتضت الحاجة لذلك وذلك بعد الحصول على موافقة مجلس الجامعة على تلك التعديلات.
- يمكن أن يحدد مجلس الكلية رسوما إضافية ثابتة لكل فصل دراسى رئيسى مقابل الخدمات الإضافية الأخرى التى تقدم لطلاب برامج الساعات المعتمدة مثل دعم المعامل وتكلفة الكتب والمراجع الدراسية والزيارات الميدانية .. الخ.
- تحصل رسوم الخدمة التعليمية لكل فصل دراسي، وتقدر قيمة رسوم الخدمة التعليمية بعدد الساعات التي يسجل فيها الطالب كل فصل دراسي ، وبحد أدنى ما يقابل رسوم خدمة تعليمية لعدد ١٢ ساعة معتمدة لكل من فصلى الخريف والربيع ، إلا إذا كان عدد الساعات المعتمدة المتبقية للحصول على الدرجة أقل من ذلك فيتم محاسبته على الساعات الفعلية للدراسة، وتكون رسوم الخدمة التعليمية للفصل الصيفي معتمدة على عدد الساعات المعتمدة التي يسجل فيها الطالب.
- يوقع الطالب على تعهد بالإلتزام بدفع رسوم الخدمة التعليمية التي تقترحها الكلية، وتوافق عليها الجامعة، مع التزام الكلية بنفس الرسوم للطالب منذ التحاقه وحتى تخرجه.
- يحدد إجمالى رسوم الخدمة التعليمية للفصل الصيفى بناءً على عدد الساعات المعتمدة التى يسجل فيها الطالب وبزيادة ٢٥% مقارنة بالفصول الدراسية الرئيسية ، مع مراعاة عدم تطبيق أى نسب خصم (منح وخلافه) فى رسوم المقررات فى الفصل الصيفى.

مادة (١٠): متطلبات الحصول على درجة البكالوريوس:

- للحصول على درجة البكالوريوس في الهندسة بنظام الساعات المعتمدة، لابد للطالب أن يستوفى كل الشروط التالية:

١- أن يجتاز الطالب عدد ١٦٥ ساعة معتمدة، طبقاً لجدول النظام الكودى للمقررات الدراسية لكل برنامج والتى تعرضها هذه اللائحة، وبمتوسط نقاط تراكمى لا يقل عن ٢,٠٠ .

٢- النجاح فى المقررات التى يقيم الطالب فيها على أساس ناجح/راسب (Pass/Fail) والتى لا تدخل فى حساب متوسط النقاط التراكمى مثل مقررات التدريب والندوات .. الخ طبقا لما ورد فى هذه اللائحة.

٣- أن يجتاز الطالب مشروع التخرج بشقيه بنجاح.

٤- إجتياز مقرر التربية العسكرية بنجاح.

٥- إتمام تدريب ميدانى (صيفي) بنجاح لمدة لا تقل عن ثمانية أسابيع على الأقل، متصلة أو على مرتين، في أحد المنشآت الصناعية أو الخدمية ذات الصلة بتخصصه، ويكون تحت إشراف الكلية بالكامل ويقدم الطالب تقريرا وافيا عن فترة التدريب تعتمده الكلية ويتم مناقشته في محتواه.

مادة (١١) المرشد الأكاديمي:

- تتيح الكلية نظاما للارشاد الاكاديمى ، مستعينة بطرق الاتصال الحديثة وتكنولوجيا المعلومات فى اجراء عمليات التسجيل والانسحاب ، والاطلاع على أداء الطالب ، وإعلان درجات الاعمال الفصلية وامتحانات نصف الفصل الدراسى والامتحانات النهائية ... الخ، اضافة الى التواصل المستمر مع الطلاب عن طريق عدد من المرشدين الاكاديميين.
- يعين منسق البرنامج ، لكل طالب ، عند التحاقه بالدراسة، مرشداً أكاديمياً من بين أعضاء هيئة التدريس، يمكن أن يستمر معه حتى نهاية الدراسة.
- يلتزم المرشد الأكاديمي بمتابعة أداء الطالب، ومعاونته في اختيار المقررات كل فصل دراسي.

مادة (١٢): شروط التعديل والإلغاء والانسحاب:

- يحق للطالب تعديل تسجيله بحذف أو إضافة مقررات خلال أسبوعين من بدء الدراسة فى فصلى الخريف والربيع ، أو الاسبوع الأول من الفصل الدراسى الصيفي.
- يحق للطالب الانسحاب من المقرر (ولا ترد له الرسوم)، خلال عشرة أسابيع على الأكثر من بداية الدراسة بفصلى الربيع و الخريف وأربعة أسابيع على الأكثر في الفصل الصيفي ، وفى هذه الحالة يحصل الطالب على تقدير (W) فى المقررات التى إنسحب منها ولا يدخل فى حساب متوسط النقاط ، كما يقوم الطالب بإعادة دراسة المقرر الذى انسحب منه فى فصل دراسى لاحق دراسة وإمتحانا بعد دفع رسوم الخدمة التعليمية المقررة.
- الطالب الذي يرغب في الانسحاب من فصل دراسي، لظروف المرض أو بعذر تقبله الكلية، عليه التقدم بطلب لشئون الطلاب، ويحصل على موافقة مجلس البرنامج على الانسحاب، ويرصد للطالب تقدير (W) فى مقررات هذا الفصل الدراسى ويقوم بإعادة المقررات التي سجل فيها، في فصل دراسي لاحق دراسة وامتحانا وليس امتحانا فقط بعد دفع رسوم الخدمة التعليمية المقررة.
- يحق للطالب إعادة التسجيل في أي مقرر رسب فيه، ويعيد المقرر دراسة وإمتحاناً، بعد دفع رسوم الخدمة التعليمية المقررة.، ويحتسب له التقدير الأخير فقط بحد أقصى للتقدير B^+، على أن يذكر كلا التقديرين فى سجل الطالب الأكاديمى
- يجوز للطالب الذى أنهى حضور حصص المحاضرات والتمارين والامتحانات الدورية وامتحان نصف الفصل الدراسى بنجاح فى مقرر ما ، أن يتقدم بالتماس الى مجلس ادارة البرنامج بتأجيل الامتحان التحريرى النهائى

وذلك بعذر يقبله المجلس وبعد موافقة أستاذ المقرر وفى هذه الحالة يتم رصد تقدير الطالب فى هذه المقرر بـ (I) "غير مكتمل" ، على أن يكمل الامتحان التحريري النهائى فى لجنة خاصة قبل مضى اسبوعين على الاكثر من الفصل الدراسى الرئيسى التالى ويتم تعديل التقدير واعتماده طبقا لذلك. وفى حالة عدم استكمال الطالب الامتحان التحريرى فى المدة الزمنية المقررة يعدل تقديره فى المقرر الى راسب (F).

مادة (١٣): متطلبات الدراسة:

تحتوى برامج البكالوريوس بنظام الساعات المعتمدة علي البرامج التالية:

١- هندسة مدنية تخصص هندسة الإنشاءات وإدارة التشييد

٢- هندسة ميكانيكية تخصص هندسة الميكاترونيات

٣- هندسة ميكانيكية تخصص هندسة الطيران ومركبات الفضاء

ولجميع هذه البرامج متطلبات مشتركة للجامعة (UR) و متطلبات مشتركة للكلية (FR) بالإضافة إلى متطلبات التخصص العام والتخصص الدقيق (MR) لكل برنامج علي حدة وذلك بإجمالى ١٦٥ ساعة معتمدة كما يلى:

متطلبات الدراسة	متطلبات مشتركة للجامعة	متطلبات مشتركة للكلية	متطلبات هندسية تخصصية
نوعية المقررات	إنسانيات وثقافة إجتماعية	علوم أساسية وهندسية	علوم هندسية تخصصية
نسبة الساعات الإجبارية	٤,٨٥% (٨ ساعة)	٢٦,٦٧% (44 ساعة)	٥٦,٩٧% (٩٤ ساعة)
نسبة الساعات الاختيارية	٣,٦٦% (6 ساعات)	١,٢١% (٢ ساعتان)	٦,٦٧ % (11 ساعة)
النسبة الاجمالية	٨,٤٨% (١٤ ساعة)	٢٨,٨٨% (٤٦ ساعة)	٦٣,٦٤% (١٠٥ ساعة)

مادة (١٤) تقديرات مقررات متطلبات الدراسة

- تقدر نقاط كل ساعة معتمدة على النحو التالي:

عدد النقاط	التقدير	النسبة المئوية الحاصل عليها الطالب	مدى الدرجات المكافئة (%)				
4.00	A^+	٩٧ فأعلى		٩٧	٩٨	٩٩	١٠٠
4.00	A	٩٣% حتى أقل من ٩٧%		٩٣	٩٤	٩٥	٩٦
3.70	A^-	٨٩% حتى أقل من ٩٣%		٨٩	٩٠	٩١	٩٢
3.30	B^+	٨٤% حتى أقل من ٨٩%	٨٤	٨٥	٨٦	٨٧	٨٨
3.00	B	٨٠% حتى أقل من ٨٤%		٨٠	٨١	٨٢	٨٣
2.70	B^-	٧٦% حتى أقل من ٨٠%			٧٦	٧٨	٧٩
2.30	C^+	٧٣% حتى أقل من ٧٦%			٧٣	٧٤	٧٥
2.00	C	٧٠% حتى أقل من ٧٣%			٧٠	٧١	٧٢
1.70	C^-	٦٧% حتى أقل من ٧٠%			٦٧	٦٨	٦٩

٦٦	٦٥	٦٤			٦٤% حتى أقل من ٦٧%	D^+	1.30
٦٣	٦٢	٦١	٦٠		٦٠% حتى أقل من ٦٤%	D	1.00
					أقل من ٦٠%	F	0.00

المقررات التي يسجل فيها الطالب كمستمع، أو التي يطلب فيها النجاح فقط ، أو لم يكملها لسبب قبلته الكلية، ولا تدخل في حساب متوسط النقاط ، ويرصد لها أحد التقديرات التالية:

التقدير	المدلول	
W	Withdrawn	**منسحب**
AU	Audit	**مستمع**
F	Fail	**راسب**
P	Pass	**ناجح**
I	Incomplete	**غير مكتمل**

مادة (١٥): حساب متوسط النقاط:

- يحسب مجموع النقاط النوعية Quality Points (QP) التى حصل عليه الطالب فى كل مقرر على أنها عدد الساعات المعتمدة للمقرر مضروبة في النقاط المخصصة للتقدير الذى حصل عليها الطالب حسب الجدول الوارد بالمادة (٢٥).
- يحسب متوسط النقاط Grade Point Average (GPA) لأى فصل دراسى على أنه ناتج قسمة مجموع النقاط النوعية التى حصل عليها الطالب فى المقررات التى سجل فيها فى الفصل الدراسى مقسوما على مجموع الساعات المعتمدة لهذه المقررات بما فيها المقررات التى رسب فيها وحصل على تقدير F.
- يحسب متوسط النقاط التراكمى Cummulative Grade Point Average (CGPA) عند نهاية كل فصل دراسى على أنه ناتج قسمة مجموع كل النقاط النوعية التى حصل عليها الطالب منذ التحاقه بالبرامج مقسوما على مجموع الساعات المعتمدة لكل هذه المقررات.
- فى حالة اعادة الطالب دراسة مقرر سبق أن رسب فيه وحصل على تقدير F ، يحتسب له التقدير الذى حصل عليه فى الإعادة بحد أقصى +B ، وعند حساب متوسط النقاط التراكمى يحسب له التقدير الأخير فقط ، على أن يذكر كلا التقديرين فى سجل الطالب الأكاديمى.
- فى حالة إعادة الطالب دراسة مقرر سبق دراسته وإجتيازه بنجاح وحصل فيه علي الحد الأدني للتقدير (D) ، وذلك بغرض التحسين يحتسب له التقدير الأخير الذى حصل عليه فى الإعادة، وعند حساب متوسط النقاط التراكمى يحسب له التقدير الأخير فقط ، على أن يتم حذف التقدير الأول من سجل الطالب.

- إذا سجل الطالب فى مقرر إختيارى من مجموعة ما ونجح فيه ، ثم عاد وسجل فى مقرر إختيارى أخر من نفس المجموعة كمقرر إضافى وذلك لتحسين درجة المقرر الذى إنتهى من دراسته سابقا ، يحسب له التقدير الذى حصل عليه فى المقرر الإختيارى الأخير إضافة إلى عدم حساب المقرر الإختيارى الأول الذى أتمه من قبل وحذفه من سجل الطالب.

مادة (١٦): تعريف حالة الطالب:

تعرف مستويات الدراسة بعدد الساعات المعتمدة التى إجتازها الطالب بنجاح وطبقا للحدود والمسميات الاتية:

مستوى (٠٠٠)	العام	Freshman
مستوى (١٠٠)	الأول	Sophomore
مستوى (٢٠٠)	الثاني	Junior
مستوى (٣٠٠)	الثالث	Senior 1
مستوى (٤٠٠)	الرابع	Senior 2

Level (000)	
Level (100)	
Level (200)	
Level (300)	
Level (400)	

كلما إجتاز الطالب ٢٠ % من متطلبات التخرج بنجاح ، أعتبر منتقلا من مستوى إلى مستوى أعلى منه (المستويات من صفر إلى ٤٠٠.

مادة (١٧): أسلوب تقييم الطالب:

- توضح التفاصيل الموضحة بهذه اللائحة توزيع درجات كل مقرر بين :أعمال الفصل، إمتحان عملي/شفوي، إمتحان نصف الفصل، الامتحان التحريري النهائي.
- يعقد لكل مقرر إمتحان تحريرى فى نهاية الفصل الدراسى لا تقل درجته عن ٤٠ % من مجموع درجات المقرر باستثناء المقررات التى تحددها اللائحة مثل مشروع التخرج والتدريب الصيفى والندوات والأبحاث.
- يعقد لكل مقرر إمتحان تحريرى فى منتصف الفصل الدراسى لا تقل درجته عن ٢٠ % من مجموع درجات المقرر باستثناء المقررات التى تحددها اللائحة مثل مشروع التخرج والتدريب الصيفى والندوات والأبحاث.
- لابد أن يحضر الطالب نسبة لا تقل عن ٧٥%، ليسمح له بدخول الأمتحان النهائى للمقرر.
- يشترط لكى يعد الطالب ناجحا فى مقرر أن يحصل على ٦٠% (تقدير D) على الأقل فى مجموع درجات المقرر وأن يحصل أيضا على ٣٠ % على الاقل من درجات الامتحان التحريرى النهائى.

مادة (١٨) التحويل من والى برامج الساعات المعتمدة:

- يجوز تحويل الطالب المقيد بنظام الساعات المعتمدة الى نظام الفصلين الدراسيين طالما لم يجتاز ٦٠% من إجمالى الساعات المعتمدة اللازمة للتخرج ، ويتم إجراء مقاصة للمقررات التى إجتازها الطالب فى نظام الساعات المعتمدة وتحدد المقررات المكافئة لها فى البرنامج الدراسى المطلوب التحويل إليه.

- لا يجوز تحويل الطالب من نظام الساعات المعتمدة إلى نظام الفصلين الدراسيين إذا لم يحقق شروط القبول لنظام الفصلين الدراسيين عند إلتحاقه بالكلية.
- لا يجوز تحويل طلاب نظام الفصلين الدراسيين المفصولين لإستنفاذ مرات الرسوب فى السنة الإعدادية أو السنوات اللاحقة إلى نظام الدراسة بالساعات المعتمدة .
- يجوز تحويل الطالب التحويل من نظام الفصلين الدراسيين إذا كان الطالب ناجح باخر فصل دراسي بالفصليين الدراسيين ويتم إجراء مقاصة مكافئة للمقررات التى إجتازها الطالب بنجاح فى نظام الفصلين الدراسيين وتحسب الساعات المعتمدة المكافئة لهذه المقررات ضمن متطلبات التخرج وتكتب تقديراتها بشهادة التخرج (مع الإشارة بانها محولة "Transferred") دون احتساب تقديرها عند حساب متوسط النقاط التراكمى ، وعلى ألا تزيد إجمالى الساعات المعتمدة لهذه المقررات عن ٣٤ ساعة معتمدة.
- يتم إحتساب المقررات التحويلية المشار إليها فى الفقرة السابقة إلى حساب متوسط النقاط التراكمى للطالب فى المقارنة لحالات التميز العلمى (منح التفوق أو تعيين معيدين) للمفاضلة و تطبيق مبدأ تكافؤ الفرص.

- تستخدم الجداول التالية لحساب التقديرات المكافئة عند تحويل الطلاب بين النظامين:

جدول تكافؤ التقديرات عند التحويل من نظام الساعات المعتمدة إلى نظام الفصلين الدراسيين

نظام الساعات المعتمدة		نظام الفصلين الدراسيين
عدد النقاط	التقدير	النسبة المئوية المناظرة
4.00	A^+	%٩٨
4.00	A	%٩٣
3.70	A^-	%٨٨
3.30	B^+	%٨٣
3.00	B	%٧٨
2.70	B^-	%٧٣
2.30	C^+	%٧٠
2.00	C	%٦٧
1.70	C^-	%٦٣
1.30	D^+	%٥٨
1.00	D	%٥٠
0.00	F	ــ

جدول تكافؤ التقديرات عند التحويل من نظام الفصلين الدراسيين الى نظام الساعات المعتمدة

نظام الفصلين الدراسيين	نظام الساعات المعتمدة	
النسبة المئوية المناظرة	عدد النقاط	التقدير
من ٩٥% الى ١٠٠%	4.00	A^+
من ٩٠% الى أقل من ٩٥%	4.00	A
من ٨٥% الى أقل من ٩٠%	3.70	A^-
من ٨٠% الى أقل من ٨٥%	3.30	B^+
من ٧٥% الى أقل من ٨٠%	3.00	B
من ٧١% الى أقل من ٧٥%	2.70	B^-
من ٦٨% الى أقل من ٧١%	2.30	C^+
من ٦٥% الى أقل من ٦٨%	2.00	C
من ٦٠% الى أقل من ٦٥%	1.70	C^-
من ٥٥% الى أقل من ٦٠%	1.30	D^+
من ٥٠% الى أقل من ٥٥%	1.00	D
أقل من ٥٠%	0.00	F

مادة (١٩) خاصة التمييز (مراتب الشرف ومنح التفوق):

- يشترط لمنح مراتب الشرف ألا يكون الطالب قد حصل على تقدير F في أي مقرر خلال دراسته بالكلية أو خارج الكلية.
- تمنح مرتبة الشرف للطالب الذى لا يقل إجمالى متوسط النقاط التراكمى عند التخرج عن3.6 مع تحقيق مثل هذا المعدل على الأقل خلال جميع فصول الدراسة ببرامج الساعات المعتمدة أو عند التحاقه بالدراسة من البرامج ذات الفصلين الدراسيين وذلك بعد عمل مقاصة.
- عند التحاق أى من الطلاب الثلاثون الاوائل فى الثانوية العامة المصرية – تخصص رياضيات – بالبرامج ، يعفى من كافة الرسوم والمصروفات الدراسية خلال الفصل الدراسى التالى لالتحاقه، ويظل هذا الإعفاء ساريا طالما حصل الطالب على متوسط نقاط تراكمى 3.60 أو أكثر. ولا يسرى ذلك على رسوم الفصل الدراسى الصيفى.

- تضع الكلية نظاما لتشجيع الطلاب المتفوقين عن طريق تخفيض المصروفات الدراسية بنسب متدرجة مع متوسط النقاط التراكمى للطالب ، وتعلن فى بداية كل فصل دراسى رئيسى قائمة الطلاب المتفوقين ونسب تخفيض المصروفات لكل طالب ، ولا تسرى منح التفوق على رسوم الفصل الدراسى الصيفى.

مادة (٢٠) الإنذار الأكاديمى – الفصل من الدراسة – آليات رفع المعدل التراكمى:

- إذا انخفض المعدل التراكمي للطالب إلى أقل من 2.00 في أي فصل دراسي، يوجه له إنذار أكاديمي، يقضى بضرورة رفع الطالب لمعدله التراكمي إلى 2.00 على الأقل.
- يفصل الطالب المنذر أكاديميا من الدراسة ببرامج الساعات المعتمدة إذا تكرر انخفاض معدله التراكمي عن 2.00 ستة فصول دراسية رئيسية متتابعة.
- اذا لم يحقق الطالب شروط التخرج خلال الحد الأقصى للدراسة وهو عشر سنوات ، عدا الفصول التى يتم فيها إيقاف قيد الطالب لعذر يقبله مجلس الكلية ، يتم فصله.
- يفصل الطالب اذا انقطع عن التسجيل بالدراسة لمدة فصلين دراسيين متصلين و بحد أقصى ستة فصول دراسية رئيسية منفصلة.
- يجوز لمجلس الكلية أن ينظر في إمكانية منح الطالب المعرض للفصل نتيجة عدم تمكنه من رفع معدله التراكمي إلى 2.00 على الأقل، فرصة واحدة وأخيرة مدتها فصلين دراسيين رئيسيين لرفع معدله التراكمي إلى 2.00 وتحقيق متطلبات التخرج ، إذا كان قد أتم بنجاح دراسة 80 % من الساعات المعتمدة المطلوبة للتخرج على الأقل.
- يجوز للطالب إعادة دراسة المقررات التي سبق نجاحه فيها بغرض تحسين المعدل التراكمي، وتكون الإعادة دراسة وامتحانا، ويحتسب له التقدير الذي حصل عليه في المرة الأخيرة لدراسة المقرر، وذلك بحد أقصي خمسة مقررات ، ويذكر كلا التقديرين في سجله الأكاديمي.

مادة (٢١) قواعد اضافيـة:

يعرض على مجلس الكلية كافة الموضوعات التى لم يرد فى شأنها نص فى مواد هذه اللائحة، وقد يتطلب الأمر الرفع للجامعة للتصديق على قرار مجلس الكلية ووفقاً للقواعد العامة التي يحددها المجلس الأعلي للجامعات.

منظومة تكويد المقررات الدراسية

فى مقررات برامج الساعات المعتمدة تستخدم الرموز المعمول بها فى اللائحة الداخلية الحالية بنظام الفصلين الدراسيين كالآتى:

جدول (أ) رموز مجموعات المقررات طبقا للاقسام العلمية

مجموعات المقرر	الرمز
مقررات من قسم الرياضيات والفيزياء الهندسية (Eng. Mathematics & Physics)	رفهـ EMP
مقررات الانسانيات (Humanities)	انس HUM
مقررات اللغة الاجنبية الفنية (Technical Foreign Language)	لغف TFL
مقررات من قسم هندسة المواد (Materials Engineering)	همو MTE
مقررات من قسم الهندسة الانشائية (Structural Engineering)	هنش STE
مقررات من قسم هندسة التشييد (Construction and Utilities Engineering)	هتش CUE
مقررات من قسم هندسة المياه والمنشآت المائية (Water and Water Structres Engineering)	همى WSE
مقررات من قسم هندسة القوى الميكانيكية (Mechanical Power Engineering)	هـقم MPE
مقررات من قسم هندسة التصميم الميكانيكي والانتاج (Mechanical Design & Production Engineering)	هتـج DPE
مقررات من قسم هندسة الالكترونيات والاتصالات الكهربية (Electronics & Electrical Communications Engineering)	هكت ECE
مقررات من قسم هندسة الحاسبات والمنظومات (Computer & Systems Engineering)	هحس CSE
مقررات من قسم هندسة القوى والآلات الكهربية (Electrical Power & Machines Engineering)	هقك EPE
مقررات من قسم الهندسة الصناعية (Industrial Engineering)	هصن INE
مقررات قسم الهندسة البيئية (Environmental Engineering)	هبى ENE
مقررات قسم الهندسة المعمارية (Architectural Engineering)	همع ARE

ثالثا: تفاصيل متطلبات الدراسة

تحتوى برامج البكالوريوس بنظام الساعات المعنمدة على متطلبات مشتركة للجامعة والكلية بالإضافة الى متطلبات التخصص العام والتخصص الدقيق كما يلى:

متطلبات الدراسة	متطلبات مشتركة للجامعة	متطلبات مشتركة للكلية	متطلبات هندسية تخصصية
نوعية المقررات	إنسانيات وثقافة إجتماعية	علوم أساسية وهندسية	علوم هندسية تخصصية
نسبة الساعات الإجبارية	٤,٨٥% (٨ ساعة)	٢٦,٦٧% (44 ساعة)	٥٦,٩٧% (٩٤ ساعة)
نسبة الساعات الاختيارية	٣,٦٦% (6 ساعات)	١,٢١% (٢ ساعتان)	٦,٦٧ % (11 ساعة)
النسبة الاجمالية	٨,٤٨% (١٤ ساعة)	٢٨,٨٨% (٤٦ ساعة)	٦٣,٦٤% (١٠٥ ساعة)

(أ) متطلبات مشتركة للجامعة

الغرض الرئيسي من التعليم الجامعي ليس فقط تَهْيِئة الطلابِ للمهنِ الناجحةِ لكن أيضاً لتَزويدهم بالمعرفةِ والمهاراتِ لتَطوير وجعل الطالب الجامعي ذو شخصية عقلانية وناجحة. علاوة على ذلك، تُساعدُ جامعةَ الزقازيق الطلاب علي اكتساب القدرات والتثقيف من البيئات التي يعيشون فيها وتنمية أدوارَهم في المجتمعِ بالاضافة الي الخدمات الإجتماعيةِ. إنّ متطلباتَ الجامعةَ تُصمّمُ للمُسَاعَدَة على إنْجاز هذه الأهدافِ في كافة المقررات سواء الاجبارية بنسبة ٤,٨٥% أو الاختيارية بنسبة ٣,٦٦ % بإجمالى ١٤ ساعة معتمدة بنسبة. ٨,٤٨% وهى موضحة بالجدول (ب) للمقررات الإجبارية والجداول من جـ١ إلي جـ ٣ للمقررات الإختيارية.

(ب) متطلبات مشتركة للكلية

تُزود الكليّةَ الطلابَ بالمعرفةِ والمهاراتِ الضرورية لتَطوير مهندس ناجح. تَحتوي متطلباتُ الكليّةَ المقررات الرئيسيةَ والمعرفةَ الأساسيةَ والتي يجب أن يلم بها المهندس. متطلبات الكليّةَ تَشْملُ ٤٦ ساعة معتمدةٍ تمثل حوالي ٢٧,٨٨% (بواقع ٤٤ ساعة معتمدة بنسبة ٢٦,٦٧% مقررات إجباريو و ٢ ساعتان بنسبة ١,٢١% مقررات إختيارية) مِنْ المجموعِ الكلي للساعات المعتمدة في شَهَادَةِ البكالوريوس. قائمة متطلباتِ الكليّةِ مختارة من عدة مقرراتِ: الكيمياء الهندسية والفيزياء الهندسية والرياضيات الهندسية والميكانيكا الهندسية والرسم الهندسي و الإسقاط ومهاراتِ حاسبِ وأخرى ، وهى موضحة بالجدولين (د١) و (د٢).

جدول (ب) متطلبات الجامعة(١٤ ساعة معتمدة بنسة ٨,٤٨% (٤,٨٥% مقررات إجبارية و ٣,٦٦ % مقررات إختيارية) من إجمالى ١٦٥ ساعة معتمدة)

م	متطلبات الجامعة University Requirements		الساعات المعتمدة Credit Hrs	محاضرة Lecture	تمرين Tutorial	معمل Lab	ساعات الأتصال Contact Hrs
١	لغف ٠٠١ TFL001	اللغة الأجنبية الفنية Technical Foreign Language	٢	١	-	٢	٣
٢	أنس ٠٠١ HUM001	تاريخ الهندسة والتكنولوجيا History of Engineering and Technology	٢	٢	-	-	٢
3	هحس ٠٠١ CSE001	مقدمة في الحاسبات والبرمجة Introduction to Computers & Programing	2	1	1	2	4
4	أنس ١٠١ HUM101	مدخل إلي القانون Introduction to Law	٢	٢	-	-	٢
٥	إخ-١ HUMxxx	مقرراختاري جامعة (١) University Elective (1)	2	٢	-	-	2
٦	إخ-٢ HUMxxx	مقرراختاري جامعة (٢) University Elective (2)	2	٢	-	-	2
٧	إخ -٣ HUMxxx	مقرراختاري جامعة (٣) University Elective (3)	2	٢	-	-	2
	اجمالـــــــــي الســـــــاعـــــات =		١٤	١٢	1	4	١٧

**عدد المقررات الاختيارية غير الهندسية ثلاثة مقررات بإجمالي عدد ٦ ساعات معتمدة وعلي الطالب اختيار مادة واحدة فقط لكل مقرر والمقررات الاختيارية موضحة بالجداول من (جـ١) الى (جـ٣)

جدول (جـ١) المقرر الاختياري الاول (أخ- ١) المستوي الجامعي المطلوب (الاول)

م Ser	الكود Code	إسم المقرر Course Title	الساعات المعتمدة Credit Hrs	محاضرة Lecture	تمرين Tutorial	معمل Lab	ساعات الأتصال Contact Hrs
١	إنس ١٠٢ HUM 10٢	إدارة الموارد البشرية Human Resources Management	٢	2	-	-	2
٢	أنس ١٠٣ HUM١٠٣	تاريخ الحضارة العربية والإسلامية History of Arabian & Islamic Civilization	2	٢	-	-	2
٣	أنس١٠٤ HUM10٤	جغرافيا الإنسان والبيئة Geography of Mankind & Environment	٢	٢	-	-	٢
٤	أنس١٠٥ HUM١٠٥	مدخل إلي المنطق Introduction to Logic	2	٢	-	-	2

جدول (جـ2) المقرر الاختياري الثاني (أخ- ٢) المستوي الجامعي المطلوب (الثاني)

م Ser	الكود Code	إسم المقرر Course Title	الساعات المعتمدة Credit Hrs	محاضرة Lecture	تمرين Tutorial	معمل Lab	ساعات الأتصال Contact Hrs
١	أنس ٢٠١ HUM٢٠١	مدخل إلي الإتصال الجماهيري Communications Introductory Mass	٢	2	-	-	2
٢	أنس ٢٠٢ HUM٢٠٢	مقدمة في علم الإجتماع Introductory to Sociology	2	٢	-	-	2
٣	أنس٢٠٣ HUM٢0٣	تاريخ مصر القديم History of Ancient Egypt	٢	٢	-	-	٢
٤	أنس ٢٠٤ HUM٢٠٤	مقدمة في علم النفس Introductory to Psychology	2	٢	-	-	2
5	إنس ٢٠٥ HUM 205	سيمنار إنسانيات ١ Humanities Seminar 1	٢	2	-	-	2

جدول (جـ٣) المقرر الاختيارى الثالث (أخ- ٣) المستوى الجامعي المطلوب (الثالث)

م Ser	الكود Code	إسم المقرر Course Title	الساعات المعتمدة Credit Hrs	محاضرة Lecture	تمرين Tutorial	معمل Lab	ساعات الأتصال Contact Hrs
١	إنس ٣٠١ HUM ٣٠١	سيمنار إنسانيات ٢ Humanities Seminar 2	٢	2	-	-	2
٢	أنس٣٠٣ HUM٣٠٣	طرق البحث العلمي Methods of Scientific research	2	٢	-	-	2
٣	أنس٣٠٤ HUM ٣٠٤	مقدمة في علم النفس الصناعي Introductory to industrial Psychology	٢	٢	-	-	٢
٤	أنس ٣٠٥ HUM٣٠٥	مدخل لعلم الإجتماع الصناعي Introductory to industrial Sociology	2	٢	-	-	2

جدول (د-١) متطلبات الكلية ٤٦ ساعة معتمدة (بإجمالى نسبة ٢٨,٨٨% بواقع ٢٦,٦٧ % مقررات إجبارية و١,٢١ % مقررات إختيارية) من إجمالى ١٦٥ ساعة معتمدة

م	متطلبات الكلية Faculty Requirements		الساعات المعتمدة Credit Hrs	محاضرة Lecture	تمرين Tutorial	معمل Lab	ساعات الأتصال Contact Hrs
١	رفهـ٠٠١ EMP001	الرياضيات الهندسية (١) Engineering Mathematics (1)	٣	٢	٢	-	٤
٢	رفهـ٠٠٢ EMP002	الفيزياء الهندسية (١) Engineering Physics (1)	٣	٢	١	٢	٥
٣	هتج ٠١١ DPE 0١١	الرسم الهندسي والإسقاط (١) Engineering Drawing and Projection (1)	٣	٢	-	٣	٥
٤	رفهـ٠٠٣ EMP003	الميكانيكا الهندسية (١) Engineering Mechanics (1)	٢	١	١	٢	٤
٥	هبي ٠٠١ ENE001	الكيمياء الهندسية Engineering Chemistry	٣	٢	-	٣	٥
٦	رفهـ٠٠٥ EMP00٥	الرياضيات الهندسية (٢) Engineering Mathematics (2)	٣	٢	٢	-	٤
٧	رفهـ٠٠٦ EMP00٦	الفيزياء الهندسية (٢) Engineering Physics (2)	٣	٢	١	٢	٥
٨	رفهـ٠٠٧ EMP00٧	الميكانيكا الهندسية (٢) Engineering Mechanics (2)	٢	١	١	٢	٤
٩	هتج٠٠١ DPE00١	تكنولوجيا إنتاج Production Technology	٣	٢	١	٢	5
10	هتج ٠١٢ DPE0١2	الرسم الهندسي والإسقاط (٢) Engineering Drawing and projection (2)	٣	٢	-	٣	٥
١1	رفهـ١٠١ EMP١٠١	الرياضيات الهندسية (٣) Engineering Mathematics (3)	٢	١	٢	-	٣
١٢	هقك ١٠١ EPE 101	أنظمة كهربية Electerical systems	٢	1	1	2	4
١٣	هقم١٠١ MPE1٠1	ديناميكا حرارية وأنظمة ميكانيكية (طلاب برنامج تشييد) Thermodynamics and Mechanical systems (Construction Program students)	2	1	1	2	4
14	هقم١٠٢ MPE1٠٢	ديناميكا حرارية (طلاب ميكاترونيات وطيران) Thermodynamics (For mechactronics and Aero-Spacecraft engineering students)	٣	2	٢	-	4
15	همو١٠١ MTE101	هندسة المواد Engineering Materials	٣	٢	١	٢	٥
16	هحس ١٠١ CSE101	تطبيقات الحاسب Computer Applications	٢	١	١	٢	٤
17	هتش ٢٠٧ CUE 20٧	إقتصاديات الهندسة (طلاب برنامج تشييد) Engineering Economics (Construction Program students)	3	٢	2	-	4
18	هصن ٢٠٧ INE 20٧	إقتصاد هندسي (طلاب ميكاترونيات وطيران) Engineering Economy (For mechactronics and Aero-Spacecraft engineering students)	2	1	2	-	3
١9	هصن٢٠٢ INE ٢٠٢	الإحصاء الهندسي Engineering Statistics	٢	٢	-	-	٢
20	Xxx Xxxx	إختياري كلية (١) Faculty Elective (1)	٢	٢	-	-	٢
	إجمالـــــــي الســـــــاعـــــات =		**٤٦**	**٣٠**	**21**	**٢١**	**٧٢**

جدول (د-2) مقرر إختياري كلية (١) (أخ- ك1)

م Ser	الكود Code	إسم المقرر Course Title	الساعات المعتمدة Credit Hrs	محاضرة Lecture	تمرين Tutorial	معمل Lab	ساعات الأتصال Contact Hrs
١	هتش ٢٠٨ CUE 20٨	إدارة المشروعات الهندسية Engineering Project Managment	٢	2	-	-	2
٢	هصن ٢٠٨ INE 208	الطرق االكمية في الهندسة Quantitive Methods in Engineering	2	٢	-	-	2
٣	هبي٢٠٢ ENE 202	التقويم البيئي للمشروعات الهندسي Environmental Evaluation of Enginnering Projects	٢	٢	-	-	٢

(ج) : المقررات التخصصية

- يَعْرِضُ البرنامجُ الهيكل الاساسي التعليمي ويشمل ١٠٥ ساعة إعتماد تمثل حوالي ٦٣,٦٤% مِنْ المجموعِ الكلي للساعات المعتمدة في شَهَادَةِ البكالوريوس.
- يُركّزُ برنامج هندسة الانشاءات وادارة التشييد على مقررات في الهندسة الانشائية وإدارة التشييد وتكنولوجيا البناء مثل تحليل الانشاءات وميكانيكا التربةِ والاساسات وتصميم المنشآت الخرسانية والمعدنية وادارة مشروعات التشييد والعقود والمواصفات وحصر الكميات وادارة معدات التشييد وادارة جودة التشييد وهذه المقررات واردة فى الجداول (هـ١) للمقررات الإجبارية و (هـ٢) للمقررات التخصصية الإختارية و (هـ٣) لنموذج الدراسة الإسترشادية بالبرنامج.
- ويُركّزُ برنامج هندسة الميكاترونيات على مقررات في مجالات: النظم الكهروميكانيكية –الماكينات الدقيقة– القياسات واجهزة القياس لمنظومات الميكاترونيات– تصميم المنظومات الميكانيكية ومنظومات الميكاترونيات– النمذجة والمحاكاه لمنظومات الميكاترونيات – الروبوتات– المواد الذكية للميكاترونيات –

المحركات والمشغلات لنظم التحكم– أنظمة التحكم الألية – النظم المتكاملة وهذه المقررات واردة فى الجداول (و١) للمقررات الإجبارية و (و٢) للمقررات التخصصية الإختارية و (و٣) لنموذج الدراسة الإسترشادية بالبرنامج.

- بينما يُركّزُ برنامج هندسة الطيران والمركبات الفضائية على مقررات في مجالات الطيران والمركبات الفضائية وتشمل: بيئة الفضاء– تحليل المهام الفضائية– تصميم هياكل الطائرات والمركبات الفضائية – المدارات ومسارات الطيران– الثبات والتحكم– تصميم أنظمة دفع الطائرات– تصميم أنظمة دفع الصواريخ– ميكانيكا الطيران والتحكم – التوجيه والتحكم وهذه المقررات والمركبات الهوائية بدون طيار وهذه المقررات واردة فى الجداول (ز.١) للمقررات الإجبارية والجداول من (ز٢) إلى (ز٨) للمقررات الإختيارية والجدول (ز٩) لنموذج الدراسة الإسترشادية بالبرنامج.

اولا:

المقررات التخصصية لبرنامج هندسة الانشاءات وادارة التشييد

جدول (هـ١) متطلبات التخصص لبرنامج هندسة الانشاءات وادارة التشييد (١٠٥ ساعة معتمدة بنسبة ٦٣,٦٤ %)

مسلسل Serial	المتطلبات التخصصية Speciality Courses		الساعات المعتمدة	محاضرة	تمرين	معمل	ساعات الأتصال
1	هنش ١٠١ STE101	تحليل الانشاءات(1) Structural Analysis 1	٣	٢	٢	_	٤
2	هنش ١٠٢ STE102	ميكانيكا الانشاءات(1) Structural Mechanics 1	٣	٢	٢	_	٤
3	هنش ١٠٢ CUE102	هندسة التشييد Construction Engineering	٣	٢	٢	_	٤
4	همي ١٠١ WSE101	الرسم المدني Civil Eng. Drawing	٣	١	_	٤	٥
5	هنش ١٠٣ STE103	مواد التشييد Construction Materials	٣	٢	١	٢	٥
6	هنش ١٠٤ STE104	الجيولوجيا الهندسية Engineering Geology	٢	٢	-	_	٢
7	هنش ٢٠١ STE201	تحليل الانشاءات(2) Structural Analysis 2	٣	٢	٢	_	٤
8	هنش ٢٠٣ CUE203	المساحة المستوية Plane Surveying	٣	٢	١	٢	٥
9	همي ٢٠١ WSE201	ميكانيكا الموائع Fluid Mechanics	٣	٢	٢	١	٥
10	هنش ٢٠٤ CUE204	تقدير التكلفة والمناقصات Cost Estimating and Tendering	٢	٢	_	_	٢
11	هبي ٢٠١ ENE201	الهندسة الصحية والبيئية(1) Sanitary & Environmental Engineering	٣	٢	٢	١	٥
12	هنش ٢٠٥ CUE205	تخطيط مشروعات التشييد(1) Construction Projects Planning (1)	٣	٢	٢	_	٤
13	هنش ٢٠٢ STE202	ميكانيكا التربة(1) Soil Mechanics 1	٣	٢	٢	١	٥
14	هنش ٢٠٣ STE203	تصميم الخرسانة المسلحة(1) Reinforced Concrete Design 1	٣	٢	٢	_	٤
15	هنش ٢٠٦ CUE206	المواصفات وحصر الكميات Specifications and Quantity Surveying	٢	٢	_	_	٢
16	هنش ٢٠٤ STE204	ميكانيكا الانشاءات(2) Structural Mechanics 2	٣	٢	٢	_	٤
17	هنش ٣٠١ STE301	تصميم الخرسانة المسلحة(2) Reinforced Concrete Design 2	٣	٢	٢	_	٤
18	هنش ٣٠٢ STE302	تصميم المنشات المعدنية(1) Steel Structures Design 1	٣	٢	٢	_	٤
١٩	هنش ٣٠١ CUE301	هندسة النقل والمرور Traffic and Transportation Engineering	٣	٢	٢	_	٤
20	هنش ٣٠٢ CUE302	تخطيط مشروعات التشييد(2) Construction Projects Planning (2)	٣	٢	٢	_	٤

تابع جدول (هـ١) متطلبات التخصص لبرنامج هندسة الانشاءات وادارة التشييد (١٠٥ ساعة معتمدة بنسبة ٦٣,٦٤ %)

مسلسل Serial	المتطلبات التخصصية Speciality Courses		الساعات المعتمدة	محاضرة	تمرين	معمل	ساعات الأتصال
21	هنش٣٠٥ CUE305	هندسه القيمه Value Engineering	2	2	_	_	2
٢٢	هنش ٣٠٣ STE303	ميكانيكا التربة (٢) Soil Mechanics 2	٣	٢	٢	١	٥
٢3	هنش ٣٠٣ CUE303	هندسة الطرق Highway Engineering	٣	٢	٢	_	٤
٢٤	هنش ٣٠٤ STE304	التحليل الإنشائي المتقدم Advanced Structural Analysis	٢	٢	-	_	٢
٢٥	هنش ٣٠٤ CUE304	عقود التشييد Construction Contracts	٢	٢	_	_	٢
٢٦	**جدول(هـ٢)**	مقرر اختياري هندسي (١) Engineering Elective 1	٣	٢	٢	_	٤
٢٧	**جدول(هـ٢)**	مقرر اختياري هندسي (٢) Engineering Elective 2	٣	٢	٢	_	٤
28	**جدول(هـ٢)**	مقرر اختياري هندسي (٣) Engineering Elective 3	٣	٢	٢	_	٤
29	هنش ٤٠٢ CUE402	الادارة المالية فى التشييد Financial management in Construction	٢	٢	_	_	٢
30	هنش ٤٠١ STE401	الاساسات Foundations	٣	٢	٢	_	٤
31	هنش ٤٠٢ STE402	المنشآت المركبة Composite Structures	٣	٢	٢	_	٤
32	هنش ٤٠٣ STE403	تصميم الخرسانة المسلحة (٣) Reinforced Concrete Design 3	٣	٢	٢	_	٤
٣٣	هنش ٤٠٤ STE404	تصميم المنشات المعدنية (٢) Steel Structures Design٢	٣	٢	٢	_	٤
34	هنش ٤٠٣ CUE403	إدارة جودة التشييد Construction Quality Management	٢	٢	_	_	٢
35	هنش ٤٠٤ CUE404	إدارة معدات التشييد Construction Equipment Management	٢	٢	_	_	٢
36	هبي ٤٠١ ENE401	الهندسة الصحية والبيئية (٢) Sanitary & Envirnomental Engineering 2	٣	٢	٢	١	٥
37	**جدول(هـ٢)**	مقرر اختياري هندسي (٤) Engineering Elective 4	٢	٢	_	_	٢
38	هنش٤١٠ CUE٤١٠	مشروع التخرج (١) Graduation Project (1)	٢	١	٢	_	٣
39	هنش٤١١ STE411	مشروع التخرج (٢) Graduation Project (2)	٢	١	٢	_	٣
	إجمالـــــــي الســـــاعـــات =		**١٠٥**	**٧٥**	**٥٤**	**١٣**	**١٤٢**

جدول (هـ٢) بيان بالمقررات الأختيارية للمتطلبات التخصصية لبرنامج هندسة الانشاءات وادارة التشييد

علي الطالب اختيار مقرر واحد فقط من كل مجموعة من المقررات التالية

مقرر اختياري (١) Engineering Elective (1)	(هتش ٣٢٠) إدارة المخاطر في التشييد CUE320 Risk Management in Construction
	(هتش ٣٢١) مواد الرصف CUE321 Pavement Materials
	(هتش ٣٢٢) هندسة وتخطيط السكك الحديدة CUE322 Railway Engineering
	(هتش ٣١٣) ديناميكا المنشات وهندسة الزلازل STE 313 Structural Dynamics & Earthquake Engineering.
مقرر اختياري (٢) Engineering Elective (2)	(هتش ٣١٤) الكباري الخرسانية والمركبة STE314 Concrete and Composite Bridges
	(هتش ٣١٥) طريقة العناصر المحددة STE315 Finite Element Analysis
	(هتش ٣٢٣) ادارة الرصف وصيانته CUE323 Pavement Management and Maintenance
	(هتش ٣٢٤) التشييد الثقيل CUE324 Heavy Construction
مقرر اختياري (٣) Engineering Elective (3)	(هتش ٤١٣) الخرسانة الخاصة STE413 Special Concrete
	(هتش ٤١٤) تصميم وتشييد الانفاق STE414 Design and Construction of Tunnels
	(هتش ٤١٥) تدعيم وتقوية المنشات STE415 Repair and Strengthening of Structures
	(هتش ٤٢٤) المنشآت المؤقتة فى التشييد CUE424 Temporary Structures in Construction
مقرر اختياري (٤) Engineering Elective (4)	(هتش ٤٢٥) انتاجيه التشييد CUE425 Construction Productivity
	(هتش ٤٢٦) إدارة الامان والصحة البيئية في التشييد CUE426 Safety, Health and Environ. Management in Construction
	(هتش ٤١٦) المباني المرتفعه والمنشآت الخاصه STE 416 High Rise buildings and special structures
	(هتش ٤١٧) الخرسانه سابقه التجهيز STE 417 Prestressed Concrete

جدول (هـ-٣) نموذج إسترشادي يوضح خطة تدريس مقررات برنامج هندسة الانشاءات وادارة التشييد.

Level 000 (Freshman)						
Semester (1) Fall				Semester (2) Spring		
	Course name	Code	CH	Course name	Code	CH
1	رياضيات هندسية ١	EMP001	3	رياضيات هندسية ٢	EMP005	3
2	فيزياء هندسية ١	EMP002	3	فيزياء هندسية ٢	EMP006	3
3	رسم هندسي وإسقاط ١	DPE011	3	رسم هندسي وإسقاط ٢	DPE 012	3
4	ميكانيكا هندسية ١	EMP004	2	ميكانيكا هندسية ٢	EMP007	2
5	كيمياء هندسية	ENE001	3	تكنولوجيا إنتاج	DPE001	3
6	لغة أجنبية فنية	TFL001	2	مقدمه حاسب وبرمجة	CSE001	٢
7	-------	-----	----	تاريخ الهندسة والتكنولوجيا	HUM001	٢
Total			١٦	Total		١٨

Level ١00 (Sophomore)						
Semester (1) Fall				Semester (2) Spring		
	Course name	Code	CH	Course name	Code	CH
1	رياضيات هندسية ٣	EMP101	٢	ميكانيكا الإنشاءات ١	STE102	3
2	تطبيقات الحاسب	CSE101	2	مواد التشييد	STE103	3
3	تحليل الأنشاءات ١	STE101	٣	الجيولوجيا الهندسية	STE104	٢
4	هندسة المواد	MTE101	3	الرسم المدنى	WSE101	3
5	ديناميكا حراريه وأنظمه ميكانيكيه	MPE101	2	هندسة التشييد	CUE102	3
6	أنظمة كهربية	EPE101	2	أختيارى جامعة ١	HUMxxx	2
7	مدخل الى القانون	HUM101	2	----	-------	------
Total			١٦	Total		١٦

Level 200 (Junior)						
Semester (1) Fall				Semester (2) Spring		
	Course name	Code	CH	Course name	Code	CH
1	اقتصاديات الهندسه	CUE207	3	تخطيط التشييد ١	CUE205	3
2	المواصفات وحصر الكميات	CUE206	2	الهندسة الصحية والبيئية ١	ENE201	3
3	تحليل الأنشاءات ٢	STE201	3	إختياري كلية ١	xxxxxx	2
4	ميكانيكا التربة ١	STE202	3	خرسانة مسلحة ١	STE203	٣
5	ميكانيكا الموائع	WSE201	3	ميكانيكا الأنشاءات٢	STE204	3
6	المساحه المستويه	CUE 203	3	الأحصاء الهندسى	INE202	2
7	تقدير التكلفة والمناقصات	CUE204	٢	أختيارى جامعة 2	HUMxxx	2
Total			19	Total		18
Level 300 (Senior 1)						
Semester (1) Fall				Semester (2) Spring		
	Course name	Code	CH	Course name	Code	CH
1	خرسانة مسلحة ٢	STE301	3	هندسة الطرق	CUE303	3
2	تصميم منشآت معدنية ١	STE302	3	ميكانيكا التربة ٢	STE303	3
3	هندسة النقل والمرور	CUE301	3	عقود التشييد	CUE304	٢
4	تخطيط التشييد ٢	CUE302	3	هندسة القيمة	CUE305	2
5	مقرر اختيارى٣	HUMxxx	2	مقرر اختيارى هندسى ١	xxxxxx	3
6	التحليل الإنشائى المتقدم	STE304	٢	مقرر اختيارى هندسى ٢	xxxxxx	3
Total			١٦	Total		16

Level 400 (Senior 2)						
Semester (1) Fall				Semester (2) Spring		
	Course name	Code	CH	Course name	Code	CH
1	تصميم منشآت معدنية ٢	STE404	3	أدارة جودة التشييد	CUE403	٢
2	الأداره الماليه فى التشييد	CUE402	2	أدارة معدات التشييد	CUE404	٢
3	أساسات	STE401	3	هندسة صحية وبيئية ٢	ENE401	٣
4	منشآت مركبة	STE402	3	مقرر هندسى اختيارى ٣	xxxxxx	3
5	خرسانة مسلحة ٣	STE403	3	مقرر هندسى اختيارى ٤	xxxxxx	2
6	مشروع التخرج ١	CUE410	2	مشروع التخرج ٢	STE411	2
Total			١٦	Total		14

Description of Course Contents and Details

Course Contents and Details for
Structural Engineering and Construction Management

LEVEL (000) Semester 1

Freshmen LEVEL 000 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP001	Engineering Mathematics 1	None	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn the main concepts of differentiation and algebra.										
Topics	Functions-Elementary functions-Inverse function-Polar and parametric coordinates-Limits-Newoton's method-Derivatives (chain rule, derivation of implicit and inverse functions)-Macclaurin's and Taylor's expansins-Theory of equations-Matrices-Gauss elimination method-Matrix Eigen value problem.										

EMP002	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
	Engineering Physics 1	None	3	٢	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn about matter properties and applications of Newton's laws.										
Topics	Field of gravitational Force-Fluid statics and Dynamics-Viscosity-Elasticity-Heat and Temperature-First law of Thermodynamics-Heat Engines-Entropy-Second law of Thermodynamics-Gas Theory-Sound Waves-Waves in elastic Media-Experiments: Simple Pendulum-Complex Pendulum-Liquid Viscosity-Liquid Surface Tension-Coefficient of heat Conduction-Specific heat. **Lab** : Simple and compound pendulum – Hook's law – measurement of coefficient of viscosity of liquid - surface tension – measurements of thermal conductivity – measurement of the specific heat of solid bodies.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP003	Engineering Mechanics (1)	None	2	1	1	2	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn the basic concepts of engineering mechanics.										
Topics	Vector applications-Resultant and Moments of a group of forces-Equivalent forces-Equilibrium-Reaction-Friction-Vector calculus-Equilibrium of trusses, frames, and simple machines-Experiments: Equivalent forces-Friction.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE011	Eng. Drawing & Projection (1)	None	3	2	-	3	5	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	Introductory concepts of engineering drawing and descriptive geometry										
Topics	Introduction (drawing instruments and their use)-Engineering graphics, techniques and skills-Geometric constructions and tangency-Rules and conventions of lines, lettering and dimensioning-Orthographic projection of engineering bodies-Frames of reference-Orthogonal projection-Representation of a straight line-Straight lines intersections-Representation of a plan-Position problems										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
ENE001	Eng. Chemistry	None	3	2	-	3	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn basic concepts of chemistry										
Topics	The atomic structure and its bearing on chemical and nuclear changes-chemical formulae-Percent composition-Thermochemistry-Chemical equilibrium-The gaseous state-Solutes-Electrolytic dissociation & ionic equilibrium-Chemical kinematics & rate of reactions-Sources of elements-Chemical industries-Building materials and ceramics industries-Corrosion-Fuels-Combustion-Experiments: Identification of simple salts-Identifications of acids.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
TFL001	Tech. Foreign Language	None	2	1	2	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (UR)										
Objective	To learn basics of foreign (English) technical language.										
Topics	Introduction: Basic concepts of technical English-Review of essentials of grammar and mechanics rules for effective Sentences-Style errors. Building Paragraphs: Main idea-types of paragraphs-Reading and analysis of technical passages that cover engineering disciplines for developing communication skills.										

LEVEL (000) Semester 2

Freshmen LEVEL 000 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP005	Engineering Mathematics 2	None	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn the main concepts of differentiation and algebra.										
Topics	Indefinite integration-Methods of integration-Definite integrals-Applications (arc length, areas, volumes, center of gravity, first order differential equation)-Numerical methods of integration-Transformations in plane-partial differentiation-Conic sections-Frames of work and different kinds of systems of coordinates-Straight line in space-Plane in space-Surfaces of the second degree-The general equation of the surfaces of the second degree.										

Freshmen LEVEL 000 COURSES											
EMP006	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
	Engineering Physics 2	None	3	٢	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn the main concepts of integration and analytical geometry.										
Topics	Charge and Matter-Electric Field-Gauss Law-Electric Potential-Capacitors and Dielectrics-Current, resistance and electromotive Force-Magnetic Field-Ampere's law- (Biot-Savart) law-Fraday's law of Induction-Inductance magnetic properties of Matter-Physical Optics-Interference and Deflection-Laser Physics-Electromagnetic Induction-Properties of magnetic materials-A/C Current-Electromagnetic Waves-Experiments: Capacitor Capacity-Magnetic Field-Ohm's Law-Sonic speed **Lab :** Verification of Ohm's law – measurement of capacitance of a capacitor – measurement of magnetic field and magnetic moment – determination of radius of curvature and focal length of a lens – measurements of refractive index of glass – microscope – measurements of light velocity ..										

Freshmen LEVEL 000 COURSES											
HUM001	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
	History of Eng. & Tech.	None	2	٢	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (UR)										
Objective	To learn about the history of engineering and technology										
Topics	Definitions of Art, science, technology and engineering-Civilizations and their relationship with natural and human sciences-Histyory of different technology and engineering specializations-Historical relations between science and technology-Relation between developments in engineering, social, economical and cultural environments-Practical examples on development of engineering activities.										

Freshmen LEVEL 000 COURSES												
EMP007	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
	Eng. Mechanics (2)	None	2	1	2	1	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	Continuing learning the basic concepts of engineering mechanics.										
Topics	Displacement, veolicity and acceleration in Cartesian, curvilinear, tangential, polar and cylindrical coordinates-relative motion-projectiles-Motion under centrifugal forces-Work-Energy-Momentum-Impulse and collision-Experiments: Momentum conservation-Projectiles-Free falling.										

Freshmen LEVEL 000 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 012	Eng. Drawing & Projection (2)	DPE011	3	2	-	3	5	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	Continuing learning of engineering drawing and descriptive geometry.										
Topics	Pictorial drawing of engineering bodies-Derivation of views of a given body-Derivation of a missing view from two given views-Rules of sectioning and sectional views-Drawing of steel sections-Auxiliary projection-Circle-Helix-Helical surfaces-Polyhedra-Sphere-Cone-Cylinder-Plane section of surfaces-Intersection of two surfaces of revolution.										

Freshmen LEVEL 000 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE001	Production Technology	None	3	2	1	2	5	50	30	50	100
								20%	30%	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn the main concepts of production technology										
Topics	Introduction in industrial safety-Engineering materials (types and properties)-Metallic alloys-Casting processes-Forming processes (forging, rolling, drawing, extrusion and spinning)-Joining processes (riveting, welding and adhesive bolding)-Cutting processes-Machining processes (turning, shaping, drilling, milling and grinding)- Measuring tools (vernier calipers and micrometers)-Introduction to production costs and management systems-Practical practicing.										

Freshmen LEVEL 000 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CSE001	Introduction to Computers and Programming	None	2	1	1	2	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (UR)										
Objective	To learn basic concepts of computers and high-level programming languages.										
Topics	Information processing-Computer building blocks - Problem solving (Algorithms and flow charts) – Programming languages- Applications: Mathematical analysis, business and administration, application in industry and communications, *etc*.										

LEVEL (100) Semester 3

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE101	Structural Analysis-1	None	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	The course of Structural Analysis (1) aims to provide students with high quality education and to prepare them for a successful professional career, and produce .graduates take the responsibility of Analysis the structures										
Topics	Types of loads – Supports – Determination of reactions – Internal forces in statically determinate beams, frames, arches and trusses – Influence lines in beams, frames, arches and trusses – Virtual work method for influence lines – Maximum bending moment and shearing force in beams – maximum absolute bending moment. Experimental Tests: Computer applications on internal forces of simple beams										

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MTE101	Materials Engineering	None	3	2	1	2	5	30	20	50	100
								30%	20%	50%	100%
Category	Compulsory (FR)										
Objective	The course of Engineering Geology aims to provide students with high quality education and to prepare them for a successful professional career, and produce graduates .Understanding characteristics of building materials										
Topics	Engineering materials; an introduction: types, structure, properties, applications – Stresses and strains – Elasticity and plasticity – Standards – Mechanical testing for metallic materials (tension, compression, bending, shear, torsion, hardness, impact, fatigue, creep) – Construction materials and their tests – Testing results and evaluation reporting. Experimental tests: Tension test for mild steel and cast iron, Compression test for mild steel, cast iron and brass, Pending test, Torsion test for mild steel and cast iron, Direct shear test, Cold bend test for mild steel, Impact test for mild steel and brass, Hardness test for mild steel, cast iron and brass, Fatigue test.										

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CSE101	Computer applications	CSE001	2	1	1	2	4	30	20	50	100
								30%	20%	50%	100%
Category	Compulsory (FR)										
Objective	The aim of this course is to explore current AutoCAD technologies and develop skills in the use of specialist CAD software to produce 2D and 3D design specifications, to transform CAD drawings into photo realistic virtual products and to gain an awareness of CAD data and how such information can be transformed to engineering drawings.										
Topics	AutoCAD drawing, 2-D , 3-D Home, Photoshop, Excel, PowerPoint, Word.										

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP101	Engineering Mathematics 3	EMP005	٢	١	2	-	٣	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (FR)										
Objective	The class will remediate basic skills, provide activities that will reinforce the preparatory Math Standards concepts, and provide time to work on homework in a structured setting under the supervision of a math teacher										
Topics	Linear vector space- vector spaces linear independence- subspaces and spanning sets, linear maps- change of basis - Linear programming- simplex method- Numerical solutions for linear equations- Numerical solutions for non linear equations - Curve fitting - Approximate Interpolation and polynomial. First order differential equation and their applications – Linear and higher order D.E and their applications Numerical Solutions for ordinary differential equation – Numerical solutions for Partial Differential equation – Partial D.E – Solution by separation of variable										

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM101	Introduction to law	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (UR)										
Objective	The course helps the students to develop their abilities for knowing needed law ensure The relation between engineering development and developing the environment socially, economically and culturally										
Topics	Law bases and sources – General bases, sources and characteristics of the administrative Law – public administration organization – General bases of the administrative organization – centralized and decentralized administration – civil servant post.										

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE101	Thermodynamics and mechanical systems	None	2	1	2	-	3	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (FR)										
Objective	Provide the understanding of different types of thermodynamic passive and active elements and different mechanical systems.										
Topics	Fundamental concepts, state variables, definition of heat and work, properties of gases, application of the 1st and 2nd fundamental theorem for the analysis of closed or open systems, heat transfer.										

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EPE101	Electrical Systems	None	2	1	1	2	4	30	20	50	100
								30%	20%	50%	100%
Category	Compulsory (FR)										
Objective	Provide basic knowledge, and understand the magnetic circuit analysis, types of DC generators, construction, the theory of operation, the steady state performance characteristics and parallel operation of generators.										
Topics	Introduction to electrical circuits, electrical installation in residential and industrial buildings (illumination networks in rural areas, data lines, telephone lines and antenna, control of air conditioning, lift) - requirements of audio systems - alarm devices (fire - security - gas). Plumbing elements and features										

LEVEL (100) Semester 4

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE102	Structural Mechanics -1	None	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	This course covers the fundamental concepts of structural mechanics with applications to civil structures. Topics include the major properties of section that used in the civil application analysis. The different types of stresses that causes due to different internal forces. Also, can calculate the principal stresses (Normal and shear) due to all cases of loading by including examples from civil,										
Topics	Geometrical properties of sections (first, second, mixed, polar and principal moment of area), Mohr's circle of inertia, Direct stresses and strains, composite structural members, Thermal stresses, Derivation of bending formula, Normal stresses, Neutral Axes, Core of sections, shear stresses, Derivation of shear formula, shear stress distribution in thin walled sections, shear center, Torsion, combined stresses, Mohr's circle of stresses, principal shear & normal stresses.										

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE103	Construction Materials	None	3	2	1	2	5	30	20	50	100
								30%	20%	50%	100%
Category	Compulsory (MR)										
Objective	Introduce the student to concrete component, concrete mixes, test of fresh and hardened concrete, concrete manufacture and concrete cracks and the affect the work of engineers										
Topics	Concrete component & technology, concrete mixes, aggregate-cement type-cement technology, specifications & classification of cement, admixtures, mix water, design of concrete mix, tests of fresh & hardened concrete-mechanical properties of concrete, effect of surrounding environment on concrete, special concrete, fracture mechanics (cracks in material under load), creep and fatigue tests, non-destructive tests, quality control. Experimental Tests: Aggregate sieve analysis-impact resistance of aggregate-initial and final setting time of cement-friction and wear resistance of aggregate-crushing resistance of aggregate fineness of cement test-compressive & tensile strength of cement-soundness of cement-slump test-Kelly ball test-compaction factor test-compressive & tensile and flexural strength tests, splitting test.										

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE102	Construction Engineering	None	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Work in a team, communicate with others effectively, lead individuals, deal with others according to the rules of the professional Ethics, engage in-self and life- long learning.										
Topics	Design of concrete forms, Concrete construction (Mixing, Transporting, Placing, Curing, Quality elements), Maintenance and repair of concrete structures, Bridge construction, Tunnel construction, Cranes, Blasting in construction.										

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE104	Engineering Geology	None	٢	2	-	-	٢	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Understanding basic theoretical engineering geology. Learning basic laboratory tests for rocks including determining their physical and mechanical properties.										
Topics	General Introduction for Geology and Engineering Geology, Minerals, Rock Classifications, Rock weathering, mass wasting and erosion, Rock Composition, Faults and folds, groundwater and surface water, Tectonics, Earthquakes, Rock Tests and Mechanical Properties.										

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
WSE101	Civil Eng. Drawing	None	3	1	0	4	5	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	To ensure The relation between engineering development and developing the environment socially, economically and culturally.										
Topics	Basic Symbols, Earthen works, Different types of culverts, Bridges, Regulators, Syphons, Aqueducts, Escapes, weirs, Locks, Different examples civil engineering works. Differnt types of steel works, Metallic bridges, Concert Structures, Different examples civil engineering works.										

Elective (1) Humanities

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM103	History of Arabian and Islamic Civilization	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University Elective (1) (UR)										
Objective	Knowledge of the history of arabian and islamic civilization										
Topics	Defining civilization in general - theories and terminology - Short account of the Arabic community pre-Islam - setting up the Islamic society -'Its development and main 'features - Islamic Civilization - the basic moral and material concepts - ethical values - the basic concepts - the main characteristics - the Arabian Islamic achievements in the fields of science knowledge and culture - the Arabian contribution to the world. civilization an human progress - the contemporary Arab -Islamic World										

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM104	Geography of Mankind & Environment	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University Elective (1) (UR)										
Objective	Knowledge of the geography of mankind & environment										
Topics	Environment of the contemporary man - the role of man in changing the environment Analytical studies for models of the environment - some environmental problems - overpopulation and food shortage -'Pollution - depletion of the natural resources – desertification.										

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM102	Human Resources Management	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University Elective (1) (UR)										
Objective	Knowledge of the human resources management.										
Topics	Activities of HR management - HR planning: Job analysis, Demand for HR, Supply of HR – Staffing: Recruitment, Selection – Training and development – Performance Appraisal – Compensation: Type of equity, Designing the pay structure, Employee benefits – Labor/management relations – Motivation - Leadership – Communication.										

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM105	Introduction to Logic	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University Elective (1) (UR)										
Objective	Knowledge of the logic and relation with the other sciences										
Topics	Definition of logic and its relation with the other sciences – types of various deductions - modern Logic and the various methods of research - Mathematical Logic –prepositional, relationships, form and predicate Logic.										

LEVEL (200) Semester 5

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE 20٧	Engineering Economics	None	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (FR)										
Objective	Student understanding fundamentals of engineering economy. Student awareness of main applications applied techniques in structure										
Topics	Time value of money: Interest, Interest formulae, the concept of equivalence, Irregular cash flow, Deferred annuities, Interest rates that vary with time, Uniform gradient of cash flows, Nominal and effective interest rates, Interest compounded more than once per year. Project appraisal: Project appraisal background, Project appraisal methods, Net present work method (NPW), Equivalent annual cost method (EAC), Payback period method, Average annual rate of return method, Discounted cash flow yield method.										

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE201	Structural Analysis 2	STE 101	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Student awareness of the importance of the calculation of deflection of structures. Students understand the methods and procedures for the calculation of deflection of different types of structure. Students are studying how to distinguish between stable / unstable and determinate / indeterminate structures										
Topics	Deflection of statically determinate structures, Statically indeterminate structures, Method of consistent deformation, Method of 3-moment equations, moment distribution, Approximate methods to solve indeterminate structures, influence lines of Statically indeterminate structures										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE202	Soil Mechanics 1	STE 104	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Category	Compulsory (MR)										
Objective	Identify the different types of soil and its properties. Understand the importance of soil classification and how to classify soils										
Topics	Phase Relationships and Basic Physical Properties of Soils, Grain Size Distribution, Consistency of Fine Grained Soils, Soil Classification Systems, Soil Compaction, Hydraulic Properties of Soils, Stress Distribution in Soils, Consolidation of Soils. Lab.: Index properties, soil classification, permeability, compaction, Consolidation.										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
WSE201	Fluid Mechanics	None	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Category	Compulsory (MR)										
Objective	Understand the fundamental concepts of fluid mechanics										
Topics	Dimensions and units, Fluid Properties, Fluid Statics (Pressure measurement, Pressure forces, Buoyancy of bodies), fluid Kinematics (Fluid motion, Continuity & energy principals), Fluid dynamics (momentum principal), resistance to Fluid motion, Flow in closed conduits, introductions to flow in open channels, unsteady flow, Hydraulics of network systems. Experimental work: Hydrostatics and stability of floating bodies, Characteristics of flow in pipes and closed conduits.										

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE203	Plane Surveying	EMP101	3	2	1	2	5	30	20	50	100
								30%	20%	50%	100%
Category	Compulsory (MR)										
Objective	Provide a general introduction to the basic concepts of plane survey. Introduce students to the concepts of basic surveying computations										
Topics	Principles, Theory of measurements & errors, Linear measurements surveying & corrections, Electronic distance measurements, Angular measurements using compass & theodolite, Traverses, Areas & land division, Map preparing, Leveling, Volumes & land grading, Volumes of cut & fill, Top graphing surveying, Tachometric surveying, Plane table surveying. Practical: Linear measurements Traverse, Using Compass to measure bearings, Linear measurements & compass Traverse, Theodolite calibration, optical and digital theodolite, theodolite Traverse, Area determination using Plane meter, Level calibration, longitudinal leveling, grid leveling, Measuring of distances & height differences using tachometric surveying ...										

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE206	Specifications & Quantity Surveying	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Discuss the Technical management of projects. Practice Quantity Surveying of project										
Topics	P Role of specifications, Types of specifications, Technical specifications, Descriptive specifications, Performance specifications, Non-technical specifications, Specifications writing techniques, Objectives of quantity surveying, Preparation of Bill of Quantity (BOQ), Measurements and quantity takeoff of construction project items.										

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE204	Cost Estimating and Tendering	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Discuss the Cost estimating methods; Early cost estimating methods and Detailed cost estimating methods.										
Topics	Structures - Tendering decisions and process - Cost estimating methods - Early cost estimating methods -Detailed cost estimating methods - The estimating process - Method statement - Materials cost estimating - Equipment cost estimating - Labor cost estimating - Estimating inaccuracy										

LEVEL (200) Semester 6
Faculty elective (1)

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE208	Engineering Project Management	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Faculty Elective (FR)										
Objective	Competence to plan , lead and successfully close projects										
Topics	Project management, settlement of projects, timetable, cost planning, management models, human resources management.										

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
INE208	Quantitative Methods in Engineering	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Faculty Elective (FR)										
Objective	• To understand definition, scope, objectives, phases, models & limitations of operations research. • To understand different application areas of operations research like transportation problem, assignment model, sequencing models, dynamic programming, game theory, replacement models & inventory models. • Formulate simple reasoning, learning and optimization problems, in terms of the representations and methods presented.										
Topics	Historical study of operation research. Linear Programming: Methods to solve LP models. The simplex methods: Degeneracy and cycling. Artificial variables. Further topics in linear programming: Duality. The dual simplex method. Sensitivity analysis. Methods of solving transportation and assignment problems. Game theory. Network analysis. Solution of CPM and PERT problems by mathematical methods and using CP model queuing theory.										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
ENE202	Environmental Evaluation of Engineering Projects	None	2	2	-	-	2	50 50%	- -	50 50%	100 100%
Catogary	Faculty Elective (FR)										
Objective	**Students should be able to:** • Effectively use basic engineering economics tools to evaluate major infrastructure projects. • Understand when to complement this basic analysis with more sophisticated tools. • Critique the process used to evaluate typical infrastructure projects. • Understand a broad range of project types of relevance to Civil and Environmental Engineering and related fields. • Understand some ways in which project performance can be measured and improved. • Understand the role of uncertainty in project evaluation. • Do an end-to-end project evaluation.										
Topics	This course covers methodologies for evaluating engineering projects, which typically are large-scale, long-lived projects involving many economic, financial, social, and environmental factors. Students learn the basic techniques of engineering economics, including net present value analysis, life-cycle costing, benefit-cost analysis, and other approaches to project evaluation.										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
ENE201	Sanitary & Environmental Engineering (1)	None	3	2	2	1	5	30 30%	20 20%	50 50%	100 100%
Category	Compulsory (MR)										
Objective	Analyze and design of sanitary engineering (water treatment and supply) projects										
Topics	Introduction to Treatment and water supply works and its importance for urban communities, Population studies and consumption rates, Water sources, Water quality, Water collection from surface sources, Distribution works (elevated storage, water distribution networks). Experimental: Suspended solids concentration, dissolved materials concentration, determining PH, Turbidity, Bacterial counting, Jar test to determine material dose, for Optimum Coagulation, determine water hardness, water conductivity.										

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE203	Reinforced Concrete Design 1	STE102	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Introduce the concepts of the analysis and design of Reinforced Concrete Elements										
Topics	Load distribution, design methods, limit state design method: flexure design, shear design, torsion design, beams, solid slabs, hollow block slabs, axially loaded members, and reinforcement detailing.										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE205	Construction Projects Planning (1)	CUE204, CUE206	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Cost control: meaning and definitions, methods, functions, reporting systems, implementation,										
Topics	Characteristics of the construction industry in Egypt, The Construction Team, Types of Contracting Companies, Types of Construction Projects. Management: Background, Nature, Meaning, Definitions, Concepts, Functions, Styles, and Trends. Projects: Life Cycle, Task Assignment, Objectives and Organization. Project management: Definition, Ingredients, Process, Project Manager Functions and Activities. Construction Management: Meaning and Definition, Objectives, Scope, Importance, and Trends. Planning: meaning, definitions, stages; Planning techniques: bar charts and linked bar charts, cumulative project progress - S curve, network analysis, activity-on-arrow diagrams, precedence diagrams, PERT, project control, follow-up and up-dating.										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE204	Structural Mechanics 2	STE102	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Student studying methods for solving of statically indeterminate structures and practice on the application by using the method Moment Distribution.										
Topics	Moment distribution method, Plates, Shells, Modeling. Computer applications for Plates and shells and Approximate method										

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
INE202	Engineering Statistics	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (FR)										
Objective	The class will remediate basic skills, provide activities that will reinforce the preparatory Math Standards concepts, and provide time to work on homework in a structured setting under the supervision of a math teacher										
Topics	Graphical presentation of data: Frequency distributions, Histograms, Stem-and-leaf Diagrams – Measures of central tendency: Sample mean for ungrouped data, sample mean of grouped data, weighted mean, Median, Mode – Measures of Dispersion: Variance and standard deviation for ungrouped sample data, Variance and standard deviation for grouped sample data, Range – Bivariate data: Scatter diagrams, Correlation Coefficient, Linear Regression – Probability Distributions – Sampling and sampling Distributions.										

Elective (2) Humanities

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 201	Introductory Mass Communication	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (2) (UR)										
Objective	Knowledge of the mass communication.										
Topics	General introduction- concept of Mass Communication- history of Mass Communication- structure of the functions of Mass Communication - mass media and technology- Ethics and traditions of Mass Communications.										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 202	Introductory Sociology	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (2) (UR)										
Objective	Knowledge of the basic concept of sociology.										
Topics	Community - Social relations - primary and secondary groups - Models .of topics in Sociology - the sociologist - Social control - Planning and development - Research curricula and tools in Sociology - Surveys in Sociology.										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 203	History of Ancient Egypt	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (2) (UR)										
Objective	To learn bases and nature of the Ancient Egyptian history.										
Topics	Earth: natural resources and wealth - bases and nature of the Egyptian history - Stone ages (ancient, medieval and modern) prehistoric age - Ancient state - the first medieval age - medieval age - the second medieval age - modern state - the third medieval age - the late periods of independence.										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 204	Introductory Psychology	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (2) (UR)										
Objective	To learn the basic concepts of psychology.										
Topics	Nature of psychology - motives - emotions - attitudes depression, and personal stress - conscientiousness and psychotherapy - recall and forgetfulness.										

LEVEL (300) Semester 7

Senior 1 LEVEL 300 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE301	Reinforced Concrete Design 2	STE203	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Introduce the concepts of the analysis and design of Reinforced Concrete Elements.										
Topics	Design members under combined flexural and axial loading –Design and detailing of frames and arches – Hinge design – Short cantilever – stairs – R.C. walls – flat slabs.										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE302	Steel Structure Design 1	STE201	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Increase the student awareness of the different structural elements composing the industrial steel structure. The design tools for the elements in different codes will be fully explained										
Topics	Introduction to steel structures – Properties and types of steel - Industrial buildings – Design of :- (Tension members - Compression members Bolted connections – Welded connections – High strength bolts – Purlins-Bracings - Crane girders – ase plates) – It includes as well different methods for achieving the design and drawings–Detailed drawings for the different items and components of industrial buildings – Different methods of fabrication and erection of industrial buildings – Computer aided design of steel structures – Execution and work shop drawings – Tests on welded steel sections includes: - Visual inspection – Liquid penetration tests – Ultrasonic tests – X-ray tests										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE301	Traffic and Transportation Engineering	EMP202	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	The students will be able to act professionally in planning and design of highways engineering disciplines and use the codes of practice of highways and traffic engineering disciplines effectively and professional.										
Topics	Principals of transportation, data collection, trip generation & distribution, methods of trip distribution, modal split, network planning, traffic assignment, evaluation of transportation projects. Traffic engineering, traffic stream characteristics, traffic volume studies and characteristics, methods of traffic count, spot speed studies, travel time and delay studies, parking studies and characteristics, highway capacity and level of service, traffic control devices, road markings, traffic signs and signals, traffic accidents and highway safety.										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE302	Construction Projects Planning (2)	CUE205	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Aims to provide an understanding of some advanced topics in planning and scheduling of construction projects and their implementation in practice using common software (like Primavera and Microsoft project).										
Topics	Project time reduction. Project resource management (Resource allocation, Resource leveling, Limited-resource considerations). Project cost control (Meaning and definitions, Methods, Functions, reporting systems, Implementation, Materials cost control, Earned value method, and Performance indices). Line of balance (LOB) for repetitive projects. Solve problems associated with these tropics. Project planning by computer (Primavera software, and MS project).										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE304	Advanced Structural Analysis	STE201, STE204	٢	2	-	-	٢	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Students are studying how to distinguish between stable / unstable and determinate / indeterminate structures. Students are studying methods for solving of statically indeterminate structures and practice on the application by using the stiffness method										
Topics	Matrix algebra by computers – Statically and kinamatically indeterminate structures – Matrix approach (1) to solve the kinematical indeterminate structures – Analysis of kinamatically indeterminate structures by stiffness method – Grids – Plane and space trusses, and frames. Computer Applications for trusses, beams, and frames										

Elective (3) Humanities

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 303	Scientific Research Methods	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (3) (UR)										
Objective	To learn about Scientific Research Methods										
Topics	Setting up, development and methods of scientific thinking - Scientific Research curricula and tools - Selecting and developing topics - deducing results - Methods of gathering and presenting data - methods of using the library - Report writing.										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 301	Seminar 1	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (3) (UR)										
Objective	To learn about characteristics of good seminar presentation.										
Topics	Talks and presentations are invited from industrial establishments relevant to the program. The guest speaker should discuss the organization, management, and recent technologies implemented in his/her industrial establishment. Students exercise writing brief technical reports on the guest presentation and deliver their own presentation about the topic.										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 304	Introductory Industrial Psychology	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (3) (UR)										
Objective	To learn an Introductory Industrial Psychology										
Topics	Definition of fields and aims of Psychology and its importance in practical life - Bases of human behaviour and motives - conscientiousness, learning. and recall - intelligence and thinking - harmony in personality - Applying principles of Psychology in the fields of Industrial Psychology - realizing convenience between the individual and, his profession - Analyzing work - Selecting the individual - Industrial training and its Psychological bases - Group interaction within the Industrial organizations.										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 305	Introductory Industrial Sociology	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (3) (UR)										
Objective	To learn an introduction of Industrial Sociology										
Topics	Concepts of the social structure - levels of the social, cultural and bringing up relations - Processes of organizing the social systems and the social change social cases related to industry and industrialization in the developing countries - the necessary social requirements to face the industrialization challenges - the contemporary theories of the industrial organizations and its suitability with the facts of the developing countries - analyzing the relation 'between industrialization and the social systems - Analyzing the relation between industrialization and the urban development in Egypt.										

LEVEL (300) Semester 8

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE303	Highway Engineering	CUE203, STE202, CUE301	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	The students will be able to act professionally in maintenance, construction pf pavement layers and use the codes of practice of highways and traffic engineering disciplines effectively and professional										
Topics	Basic design controls, sight distance, horizontal alignment, vertical alignment, climbing lanes, cross section elements, intersections. Types of highway pavements, soil classification, measuring soil strength, stresses and strains in flexible pavement, design of flexible pavement, types of asphalt materials, design of asphalt mix, asphalt plants, construction of different pavement layers.										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE304	Construction Contracts	CUE204, CUE206	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Provide students with high quality education and to prepare them for a successful professional career, and produce graduates take the responsibility of construction .management of projects										
Topics	Methods of contractors' selection: open tendering, selective tendering, serial tendering, negotiated tenders. Construction contracts basics and definitions. Types of construction contracts: cost reimbursement contracts, cost plus percentage, cost plus fixed fee, Target cost, Price given in advance contracts: Lump sum contracts, Unit price contracts, Contracts based on a schedule of rates, Design and build contracts - The privatized approach - Concept of management contracting - Selection of a contractor and a contract - Identification of strategic factors. Legal Aspects of Construction Projects "Egyptian Law", Legal Aspects of Construction Projects "FIDIC", Construction Claims										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE303	Soil Mechanics 2	STE202	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Category	Compulsory (MR)										
Objective	the students will be able to Identify the different types of soil and its properties and understand the importance of soil classification and geotechnical applications										
Topics	Earth Pressure - Retaining Walls - Sheet Piles - Slope Stability - Bearing Capacity of Soils.										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE305	Value Engineering	CUE201	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Value Engineering aims to provide students with high quality education and to prepare them for a successful professional career, and produce graduates take the responsibility of .construction management of projects										
Topics	Definitions of value engineering, Value engineering requirements, Incentive provisions in construction contracts, Factors to be considered when applying value engineering concept, Fundamentals of value engineering, Methodology in generating value engineering proposals, Creativity in value engineering, Life cycle cost analysis, Weighted evaluation.										

Engineering Elective (1)

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE321	Pavement Materials	LEVEL 300	3	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (1) (MR)										
Objective	This content of the course aims to defining the components of the paving materials used and their different characteristics and the tests that should be conducted to test the validity of the materials used.										
Topics	Subgrade soil- subbase soil- base soil – wearing surface- paving soil tests- asphalt layer tests- material quality control.										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE322	Railways Engineering	LEVEL 300	3	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (1) (MR)										
Objective	Support the graduate students with high-quality level of theoretical knowledge and research skills to enable them add value in their professional practice and furthermore, for the master conduct high-quality theoretical and applied research in various fields of Railways.										
Topics	Types of railways lines, Speeds Practical Consideration to increase speed, Preparing railways for High speeds, Vertical Alignment, Horizontal Alignment, Superelevation Rate, Effective and suitable Running, Allowable Centrifugal Force, Reversed Transition Curves										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE320	Risk Management in Construction.	LEVEL 300	3	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (1) (MR)										
Objective	Risk Management in Construction aims to help students develop their abilities for knowing the needed knowledge about Risk Management in Construction.										
Topics	Roots of uncertainty in construction projects, need for risk management, steps for managing project riska, risk identification, risk assessment and analysis, qualitative and quantitative approaches, risk mitigation and transfer strategies, risk sharing, risk control during project execution, organizing for risk management, role of risk manager, risk-based decision making, risk considerations for various project partticipants.										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE313	Structural Dynamics & Earthquake .Engineering	LEVEL 300	3	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (1) (MR)										
Objective	Aims to provide an understanding of the main concept of structure dynamic, formulation of the dynamic equation of motion of single and multi-degrees of freedom and there solution under different types of dynamic loads and provide also the earthquake hazard, analysis of structures subject to earthquake-induced loads and evaluation of a range of design techniques (simplified modal response spectrum method, multi modal response spectrum method, and time history analysis) and their implementation in practice, using the Egyptian earthquake design code.										
Topics	Equation of motion of single degree of freedom system. Free vibration. Forced vibration. Multi-degrees of freedom system modal analysis. Response spectra. Earthquake mechanism and characteristics and its engineering significance, Determine the suitable lateral resistance system for the buildings Choose the suitable method of seismic analysis. Determine the seismic force in the structural elements to design safe structures against earthquakes. Know the earthquake provisions in the Egyptian code of loading. Solve the problems associated to the architectural configuration. Have a knowledge about the recent seismic control systems.										

Engineering Elective (2)

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE315	Finite Element Analysis Method	LEVEL 300	3	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (2) (MR)										
Objective	The students will be able to understand the Finite Element Method.										
Topics	Stiffness matrix method for grid, Stiffness matrix method for space truss, Stiffness matrix method for space frame, Finite element method and advantages, shape function, mapping function										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE324	Heavy Construction	LEVEL 300	3	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (2) (MR)										
Objective	Teach students and enhance their knowledge about recent systems and technologies of construction that are applied in construction of some mega civil projects.										
Topics	Construction methods for infrastructure and mega projects involving heavy civil engineering tasks and activities. Typical large scale projects span a wide range of applications and disciplines in civil engineering: transportation, bridges, tunnels, high rise buildings, sewage and drinking water networks, water treatment plants, airports, marine structures, earth filled dams and levee systems, heavy industrial and power plants, and other mega projects. The pertaining construction methods will be demonstrated along with the structural system and equipment technology. Presentations on selected real-life projects will demonstrate the application of such technologies. Sound implementation of the presented material heavily relies on pre-assessment of the project requirements that should be supplemented with adequate choice of construction method and equipment as well as identifying the required measures during the temporary phases of construction. This approach is prudent for technology-driven heavy civil engineering. Special foundations play an instrumental role in civil engineering applications – particularly mega projects. They typically mandate continuous advancements in construction technologies and innovative development in the associated construction equipment and supplementary machinery. A quick overview on fundamentals of shallow and deep foundations will be presented. Emphasis will be placed on selection of adequate foundation systems for the mega projects. The appropriate construction methods and key equipment will be presented. The relationship between the geological/sub surface conditions and nature of project, on one hand, and the appropriate construction method and equipment, on the other hand, is discussed.											

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE314	Composite & Concrete Bridges	LEVEL 300	3	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (2) (MR)										
Objective	The objective of course is to introduce the theory and application of analysis and design of concrete composite bridges. The course focuses on understanding the behavior of composite bridge components (beam, slab and column) subjected to gravity as well as lateral loads.										
Topics	Identify composite structures, their types and components. Explain the behavior of constituents in the composite structures. Determine stresses and strains relation in composite bridge members. Illuminate the knowledge and analysis skills for concrete composite bridges. To make the students to learn the advantages and dis advantages of concrete composite bridges. Be able to analyze composite bridge structural systems under gravity and lateral loads. Be able to design different elements of composite bridge structural systems subjected to gravity and lateral loads. Be able to produce a complete project document and present in a concise and complete manner to include structural drawings and structural calculations.										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE323	Pavement Management & Maintenance.	LEVEL 300	3	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (2) (MR)										
Objective	Provide students with high quality knowledge of Pavement Management & Maintenance and to prepare them for a successful professional career, and produce graduates take the responsibility of design the well-known.										
Topics	Introduction to Pavement Management, Pavement Serviceability & Performance, Pavement Distresses, Condition Survey, Skid Resistance and Pavement Safety, AASHO Road Test, Performance of Concrete Pavements, A Rational Design for Concrete Pavements, Structural Evaluation of Flexible Pavements, Types of Overlay.										

LEVEL (400) Semester 9

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE402	Financial Management & Accounting in Construction	CUE201, CUE304	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Provide students with high quality education and to prepare them for a successful professional career, and produce graduates take the responsibility of construction management of projects.										
Topics	Project financial management: Cash flow prediction, Cash flow analysis, Cost of finance - Basics of accounting: base of accounting, accounting conventions, Methods of income recognition - Company financial documents: Balance sheet, Income statement - Compilation of financial statement: Transaction recording, Book keeping fundamentals - Analysis of financial statement: Vertical analysis, Horizontal analysis, Ratio analysis - Construction financing: Sources of finance, cost of finance and company cost of capital - Risk return relationship: Evaluation of return on investment and associated risks, risk return tradeoff relationship										

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE404	Steel Structures Design 2	STE 302	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Provide students with high quality education and to prepare them for a successful professional career, and produce graduates take the responsibility of construction the steel structures.										
Topics	Parts of steel bridges - Types of steel bridges – Loads on bridges - Working stresses - Plate girder bridges – Flooring of roadway bridges - Flooring of railway bridges - Design of: - Bracings - Bearings – Main girder including buckling in web plate and design of Flanges – Curtailment of flange plates - Design of stiffeners and connections- Design of splices - Computer aided design of steel bridges – Tests on validity of ordinary bolts – Tension Tests – Shear Tests.										

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE403	Reinforced Concrete Design 3	STE 301	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Provide students with high quality education and to prepare them for a successful professional career, and produce graduates take the responsibility of construction the reinforced concrete structures										
Topics	Waters tanks - Deep beams - Large span systems – Design of buildings under lateral loading – Shells.										

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE402	Composite Structures	STE301, STE302	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Understand the methods and procedures for design the composite structures.										
Topics	Introduction – Types of composite beams–Degrees of interaction– Design philosophy – Shear connectors – Design of composite beams – Types of composite slabs – Design of slabs – Types of columns – Design of columns. Experimental Tests: Push out test – Tension test – Sliding test.										

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE401	Foundations	STE303	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Students with high quality education and to prepare them for a successful professional career, and produce graduates Understanding site investigations and design of foundations..										
Topics	Site investigations- Choice of type of Foundation- design of shallow foundations- Design of deep foundations- Construction dewatering and ground water control- Problematic soils.										

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE410	Graduation Project 1	CSE001+ ١٢٠ CH completed	2	1	2	-	3	50	50	----	100
								50%	50%	----	100%
Category	Compulsory (MR)										
Objective	Applications on structural engineering and construction management projects										
Topics	Applications on structural engineering and construction management projects										

LEVEL (400) Semester 10

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE403	Construction Quality Management	CUE205, CUE206	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Provide students with high quality education and to prepare them for a successful professional career, and produce graduates take the responsibility of construction management of projects										
Topics	Terms & definitions,Quality management, Quality control,Statistical quality control, Process Q. control, Q. assurance, Q. systems, Factors affecting construction quality, Costs of poor quality, ISO series, Quality culture, Continuous improvement cycle, Total quality management.										

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE404	Construction Equipment Management	CUE201, STE202	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Category	Compulsory (MR)										
Objective	Provide students with high quality education and to prepare them for a successful professional career, and produce graduates take the responsibility of construction management of projects										
Topics	Fundamentals of moving earth: Material properties, Excavating equipment, Loading and hauling equipment, Grading and compaction equipment, Matching of earth work equipment - Cranes: Major types of cranes, Selecting of a suitable crane type and size - Pile driving equipment: Types of pile driving equipment, Selection of a suitable pile driving machine - Concrete equipment: Moving and placing concrete, Selecting a suitable method for moving and placing concrete, Production rate estimating - Pavement equipment: Mix plant, Transport equipment, Paver, Compactor . Equipment replacement..										

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
ENE401	Sanitary & Environmental Engineering (2)	None	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Category	Compulsory (MR)										
Objective	Understand the fundamental concepts of collection and treatment of wastewater to develop the basic skills necessary for the rational design of collection, treatment and control systems used in wastewater engineering as well as for an understanding of those processes at work in the natural environment.										
Topics	An introduction about wastewater works and wastewater characteristics – estimation of wastewater quantities and sources – design of wastewater networks and pump stations- treatment processes (preliminary, biological + sludge disposal). Experiments to determine: Volatile suspended solids concentration - volatile dissolved solids concentration –consumed biochemical oxygen –consumed chemical oxygen – nitrate concentration – nitrite concentration – phosphor concentration.										

Engineering Elective (3)

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE413	Special Concrete & Steel Structures.	LEVEL 400	3	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (3) (MR)										
Objective	Provide students with high quality knowledge of **Special Concrete & Steel Structures.** and to prepare them for a successful professional career, and produce graduates take the responsibility of design the well-known										
Topics	Design special concrete and steel structures under lateral loads; earthquake and wind. Lateral load resisting systems, analysis, design, and detailing. Prestressed concrete design. Reinforced concrete bridges; loads, types and systems, analysis, design, detailing, special considerations										

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE414	Design and Construction of Tunnels	LEVEL 400	3	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (3) (MR)										
Objective	Provide students with high quality knowledge of Design and Construction of Tunnels. and to prepare them for a successful professional career, and produce graduates take the										

	responsibility of design the well-known
Topics	Project Development, Soft Ground Tunnelling, Concrete Lining, Hard Ground Tunnelling, advanced Design and Construction of Tunnels

Senior 2 LEVEL 400 COURSES												
Code	**Course Title**	**Prerequisite**	**Contact hours**					**Marks**			
			Cr	**Lec**	**Tutorial**	**Lab**	**Total**	**CW**	**O/P**	**FE**	**Total**
STE415	**Repair and Strengthening of Structures.**	**LEVEL 400**	**3**	**2**	**-**	**-**	**2**	**50**	**-**	**50**	**100**
								50%	**-**	**50%**	**100%**
Catogary	**Engineering Elective (3) (FR)**										
Objective	Provide students with high quality knowledge of Design and **Repair and Strengthening of Structures.** and to prepare them for a successful professional career, and produce graduates take the responsibility of design the well-known										
Topics	Introduction Repair and Strengthening of Structures., Causes of Deterioration and needs for Repair , Methodology and strategy of repair , the type and extent of deterioration-causes of deterioration and whether the deterioration is still active, the rate of deterioration, the time remaining before repair or replacement, the effects of deterioration on serviceability if repair or replacement is deferred, the most cost-effective means to prevent further deterioration to the structure, Concrete defects, Column jacket, Beam jacket, Slab jacket, Foundation repair, Inspection of concrete structures, Concrete tests, Repair materials										

Senior 2 LEVEL 400 COURSES												
Code	**Course Title**	**Prerequisite**	**Contact hours**					**Marks**			
			Cr	**Lec**	**Tutorial**	**Lab**	**Total**	**CW**	**O/P**	**FE**	**Total**
CUE425	**Temporary Structures in Construction**	**LEVEL 400**	**3**	**2**	**-**	**-**	**2**	**50**	**-**	**50**	**100**
								50%	**-**	**50%**	**100%**
Catogary	**Engineering Elective (3) (MR)**										
Objective	Provide students with high quality knowledge of **Temporary Structures in Construction.** and to prepare them for a successful professional career, and produce graduates take the responsibility of design the well-known										
Topics	Introduction to construction applications of concrete, Economy and safety of formwork, Material properties and allowable stresses, Design loads of formwork (vertical loads , lateral pressure), Method of analysis, Forms for footings, Forms for walls and columns, Forms for beams and floor slabs, Failures of formwork, Shores and scaffolding.										

Engineering Elective (4)

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE425	Construction Productivity	LEVEL400	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Category	Engineering Elective (4) (MR)										
Objective	Provide students with high quality education and to prepare them for a successful professional career, and produce graduates take the responsibility of construction management of projects										
Topics	Construction productivity basics, Terms and definitions, Construction productivity measures, Factors affecting productivity, Production rates: measurement and improvement, Productivity measurement system, Modeling production rate variability, Productivity and quality, Measurement and improvement of utilization, Construction productivity in Egypt										

Senior 2 LEVEL 400 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE426	Safety, Health & Envir. Manag. in Construction.	LEVEL 400	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (4) (MR)										
Objective	Provide students with high quality knowledge of **Safety, Health & Envir. Manag. in Construction** and to prepare them for a successful professional career, and produce graduates take the responsibility of design the well-known.										
Topics	Health and safety issues to be managed in the construction industry to protect employees, contractors, neighbours and others, The basics of local law The importance of risk assessments and method statements and the development process, Site requirements for the welfare of construction workers on site, Hazards and controls associated with construction sites and activities including working at height and confined spaces, Site environmental management including management of waste and ecology										

Senior 2 LEVEL 400 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
STE416	High Rise buildings and special structures	LEVEL 400	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (4) (MR)										
Objective	Provide students with high quality knowledge of **High Rise buildings and special structures** and to prepare them for a successful professional career, and produce graduates										

	take the responsibility of design the well-known.
Topics	Introduction to high-rise buildings and their classification. Vertical Load Structural systems – Lateral Force resisting systems – Wind loads and design requirements- Seismic Loads and methods of earthquake design - Analysis and Design of High rise building elements- High rise construction techniques – Foundation Systems – Introduction to Long Span Bridges structural systems – Cable stayed bridges – Cable suspended Bridges – Prestressed Box Girder Bridges – Segmental Bridges – Outlines of Bridge design.

Senior 2 LEVEL 400 COURSES												
Code	**Course Title**	**Prerequisite**	**Contact hours**					**Marks**			
			Cr	**Lec**	**Tutorial**	**Lab**	**Total**	**CW**	**O/P**	**FE**	**Total**
STE417	**Prestressed Concrete**	**LEVEL 400**	**2**	**2**	**-**	**-**	**2**	**50**	**-**	**50**	**100**
								50%	**-**	**50%**	**100%**
Catogary	**Engineering Elective (4) (MR)**										
Objective	Provide students with high quality knowledge of **Prestressed Concrete** and to prepare them for a successful professional career, and produce graduates take the responsibility of design the well-known.										
Topics	Prestressed concrete: basic concepts of prestressing, fibre stresses in a prestressed beam, load balancing, permissible stress in concrete and steel, prestressing systems, prestress partial losses, flexure, shear and torsion design of prestressed concrete elements, indeterminate PC structures, prestressed concrete slabs. Applications on common commercial software										

Senior 2 LEVEL 400 COURSES												
Code	**Course Title**	**Prerequisite**	**Contact hours**					**Marks**			
			Cr	**Lec**	**Tutorial**	**Lab**	**Total**	**CW**	**O/P**	**FE**	**Total**
STE41١	**Graduation Project 2**	**CUE410**	**2**	**1**	**2**	**-**	**3**	**50**	**50**	**---**	**100**
								50%	**50%**	**---**	**100%**
Category	**Compulsory (MR)**										
Objective	Applications on structural engineering and construction management projects										
Topics	Applications on structural engineering and construction management projects										

ثانيا:

المقررات التخصصية لبرنامج هندسة الميكاترونيات

جدول (و١) متطلبات التخصص لبرنامج هندسة الميكاترونيات (١٠٥ ساعة معتمدة بنسبة ٦٣,٦٤ %)

مسلسل Serial	المتطلبات التخصصية Speciality Courses		الساعات المعتمدة	محاضرة	تمرين	معمل	ساعات الأتصال
1	هقم 104 MPE 104	مقدمة في الميكاترونيك Introduction to Mechatronics	٣	٢	٢	-	٤
2	هفك ١٠٢ EPE 102	نظرية الدوائر Circuit Theory	3	٢	١	2	5
3	ر فهـ ١٠٤ EMP104	الطرق العددية Numerical Techniques	٢	٢	١	1	4
4	هتج١٠١ DPE١٠١	ميكانيكا الألات Mechanics of Machines	٣	٢	2	-	٤
5	هتج ١٠٢ DPE102	رسم الماكينات Machine Drawing	3	2	-	٣	٥
6	هتج١٠٣ DPE103	تحليل الإجهادات Stress Analysis	٣	٢	2	-	٤
7	هتج 202 DPE202	تصميم أجزاء الماكينات Machine Elements Design	٣	٢	٣	-	٥
8	هتج 203 DPE203	نظرية الماكينات والأليـــات Theory of Machines and mechanisms	٣	٢	٢	-	٤
9	هـقم ٢٠١ MPE201	ميكانيكا الموائع Fluid Mechanics	٣	٢	٢	١	٤
10	هكت ٢٠١ ECE 201	هندسة الالكترونيات Electronics Engineering	٣	٢	١	٢	٥
11	هتج ٢٠١ DPE 201	الإهتزازات الميكانيكية Mechanical Vibrations	٣	٢	٢	1	٥
12	هكت ٢٠٢ ECE 202	الدوائر الالكترونية Electronic Circuits	٣	٢	٢	-	٤
13	هـقم ٢٠٢ MPE 202	انتقال الحرارة والكتلة Heat and Mass Transfer	٣	٢	١	٢	٥
14	هحس٣٠١ CSE 301	المعالجات الدقيقة Microprocessors	٢	٢	-	١	٣
15	هتج٢٠٤ DPE204	عمليات التصنيع Manufacturing Processes	٣	٢	2	-	4
16	هتج 308 DPE308	نظرية التحكم Control Theory	٣	٢	٢	-	٤
17	هحس 202 CSE 202	التصميم المنطقي الرقمي Digital Logic Dsign	٣	٢	١	١	٤
18	هـقم ٣٠٢ MPE 302	آلات الموائع Turbomachinery	٣	٢	١	٢	٥
19	هتج 302 DPE 302	تصميم منظومات الميكاترونيات Mechatronics Systems Design	٣	٢	٢	-	٤
20	هحس ٣٠٤ CSE 304	المحركات والمشغلات Drives and Actuators	٣	٢	١	١	٤
21	هفك ٣٠٢ EPE 302	الكترونيات القدرة Power Electronics	٣	٢	١	١	٤

تابع جدول (و١) متطلبات التخصص لبرنامج هندسة الميكاترونيات (١٠٥ ساعة معتمدة بنسبة ٦٣,٦٤ %)

مسلسل Serial	المتطلبات التخصصية Speciality Courses		الساعات المعتمدة	محاضرة	تمرين	معمل	ساعات الأتصال
22	هتج 406 DPE 406	التصميم والتصنيع بالحاسب CAD/ CAM	٣	٢	-	٣	٥
23	هتج 307 DPE 307	النمذجة والمحاكاة Modeling and Simulation	٢	٢	-	١	٣
24	هكت ٣٠٥ ECE 305	نظرية النظم المتكاملة Theory of Integrated systems	٢	٢	١	-	٣
25	هتج ٣٠٦ DPE 306	الروبوتات (١) Robotics (1)	٢	٢	-	١	٣
26	هتج ٤٠٧ DPE 407	تكنولوجيا المحاكاة Simulation Technology	٣	٢	-	٣	٥
27	هحس ٣٠٢ CSE302	المتحكمات المنطقية Logic Controllers	٢	٢	١	-	٣
28	هتج 301 DPE 301	تصميم المنظومات الميكانيكية Mechanical Systems Design	٣	٢	٢	-	٤
29	**جدول (و٢)**	مقرر هندسى أختياري ١ Engineering Elective (1)	٣	2	٢	-	٤
30	**جدول (و٢)**	مقرر هندسى أختياري ٢ Engineering Elective (2)	٢	2	-	1	٣
31	**جدول (و٢)**	مقرر هندسى أختياري ٣ Engineering Elective (3)	٢	2	-	1	٣
32	هقم 308 MPE 308	القياسات وأجهزة القياس Measurements and Instrumentation	٢	٢	-	٢	٤
٣٣	هتج ٤٠١ DPE 401	تطبيقات الحاسب في الميكاترونيك Computer Applications in Mechatronics	٢	١	-	٣	٤
34	هحس٤٠١ CSE401	المتحكمات الدقيقة Microcontrollers	٢	٢	-	١	٣
35	هتج ٤٠٣ DPE 403	الروبوتات (٢) Robotics (2)	٣	٢	2	١	٥
36	هقم ٤٠٥ MPE 405	أنظمة قوي الموائع Fluid Power Systems	٣	٢	2	١	٥
37	**جدول (و٢)**	مقرر هندسى أختياري ٤ Engineering Elective (4)	2	٢	-	١	٣
38	**جدول (و٢)**	مقرر هندسى أختياري ٥ Engineering Elective (5)	٢	٢	-	١	٣
39	هقم ٤٠٢ MPE 402	مشروع تخرج (١) Graduation Project (1)	٢	١	-	٣	٤
40	هتج 404 DPE 404	مشروع تخرج (2) Graduation Project (2)	2	1	–	٣	٤
	إجمالـــــــي الســـــاعـــات =		**١٠٥**	**٧٧**	**٤١**	**٤٤**	**١٦٢**

جدول (و٢) بيان بالمقررات الأختيارية للمتطلبات التخصصية لبرنامج هندسة الميكاترونيات

قائمة المقررات الاختيارية (١)،(٢)، (٣) ،(٤) ، (٥)

الكود	المقرر	ملاحظات
هقم 309 (MPE 309)	الات الإحتراق الداخلي Internal Combustion Engines	مقرر إختياري هندسي (١)
هقم 310 (MPE 310)	الطاقة المتجددة Renewable Energy	
هصن 301 (INE301)	إدارة التصنيع Manufacturing Management	
هتج ٤٠٨ (DPE 408)	Electro Mechanics & Motion Control الأنظمة الكهروميكانيكية والتحكم الحركي	مقرر إختياري هندسي (٢)
هتج 409 (DPE 409)	التحكم في قوي الموائع Fluid Power Control	
هتج 410 (DPE 410)	CNC Machines & Material Cutting Processes ماكينات التشغيل بالتحكم الرقمي وعمليات قطع المواد	
هحس 405 (CSE 405)	معالجة الصور والرؤية بالحاسب Image Processing and Computer Vision	مقرر إختياري هندسي (٣)
هكت 406 (ECE 406)	تصميم الأنظمة المدمجة Embedded Systems Design	
هتج 411 (DPE 411)	ديناميكا أنظمة السيارات والتحكم فيها Vehicle System Dynamics and Control	
هكت٤٠٤ (ECE 404)	أجهزة الإستشعار ومعالجة الإشارات Sensors and Signal Processing	مقرر إختياري هندسي (٤)
هقم 409 (MPE 409)	محطات الطاقة Power Plants	
هتج 412 (DPE 412)	أنظمة التحكم الألي المتقدمة Advanced automatic control systems	
هصن ٤٠٣ (INE 403)	هندسة الأمان الصناعي Industrial Safety Engineering	مقرر إختياري هندسي (5)
هكت ٤٠٣ (ECE 403)	المنظومات الإلكترونية الرقمية Digital Electronic Systems	
هحس ٤٠٢ (CSE402)	الذكاء الإصطناعي Artificial intelligence	

جدول (و٣) نموذج إسترشادي يوضح خطة تدريس مقررات برنامج هندسة الميكاترونيات

Level 000 (Freshman)						
Semester (1) Fall				Semester (2) Spring		
	Course name	Code	CH	Course name	Code	CH
1	رياضيات هندسية ١	EMP001	3	رياضيات هندسية ٢	EMP005	3
2	فيزياء هندسية ١	EMP002	3	فيزياء هندسية ٢	EMP006	3
3	رسم هندسي وإسقاط ١	DPE011	3	رسم هندسي وإسقاط ٢	DPE012	3
4	ميكانيكا هندسية ١	EMP004	2	ميكانيكا هندسية ٢	EMP007	2
5	كيمياء هندسية	ENE001	3	تكنولوجيا إنتاج	DPE001	3
6	لغة أجنبية فنية	TFL001	2	مقدمه حاسب وبرمجة	CSE001	٢
7	-------	-----	----	تاريخ الهندسة والتكنولوجيا	HUM001	٢
Total			١٦	Total		١٨

Level ١00 (Sophomore)						
Semester (1) Fall				Semester (2) Spring		
	Course name	Code	CH	Course name	Code	CH
1	رياضيات هندسية ٣	EMP101	٢	مدخل إلى القانون	HUM101	٢
2	المواد الهندسية	MTE101	3	رسم الماكينات	DPE102	3
3	ميكانيكا الات	DPE101	٣	مقدمة في الميكاترونيات	MPE 104	3
4	تطبيقات الحاسب	CSE101	٢	تحليل الإجهادات	DPE103	3
5	ديناميكا حرارية	MPE102	3	أنظمة كهربية	EPE101	2
6	نظرية الدوائر	EPE102	٣	الطرق العددية	EMP104	2
7	---------	----------	---	إختياري جامعة ١	xxxxx	2
Total			١٦	Total		١٧
Level 200 (Junior)						
Semester (1) Fall				Semester (2) Spring		
	Course name	Code	CH	Course name	Code	CH
1	إختياري كلية ١	xxxx	2	الدوائر الإلكترونية	ECE202	3
2	ميكانيكا الموائع	MPE201	3	إقتصاد هندسي	INE207	2
3	هندسة الإلكترونيات	ECE201	3	تصميم أجزاء الماكينات	DPE202	3
4	نظرية الماكينات والأليـــــات	DPE٢03	3	إهتزازات ميكانيكية	DPE201	٣
5	عمليات التصنيع	DPE204	3	إنتقال الحرارة والكتله	MPE202	3
6	إحصاء هندسي	INE202	2	التصميم المنطقي الرقمي	CSE202	٣
7	إختياري جامعة ٢	xxxxx	٢	----------	----------	---
Total			18	Total		17
Level 300 (Senior 1)						
Semester (1) Fall				Semester (2) Spring		
	Course name	Code	CH	Course name	Code	CH
١	تصميم منظومات الميكاترونيات	DPE 302	٣	نظرية التحكم	DPE308	٣
2	القياسات وأجهزة القياس	MPE308	٢	نظرية النظم المتكاملة	ECE 305	٢
3	تصميم المنظومات الميكانيكية	DPE301	3	الروبوتات ١	DPE 306	٢
4	إختاري هندسي ١	xxx	٣	النمذجة والمحاكاه	DPE 307	2
5	الكترونيات القدرة	EPE 302	3	المحركات والمشغلات	CSE 304	3
6	إختياري جامعة ٣	xxxxx	2	الات موائع	MPE302	3
7	المعالجات الدقيقة	CSE301	٢	المتحكمات المنطقية	CSE302	٢
Total			18	Total		١٧

Level 400 (Senior 2)						
Semester (1) Fall				Semester (2) Spring		
	Course name	Code	CH	Course name	Code	CH
1	مشروع مختار ١	MPE 402	٢	الروبوتات ٢	DPE 403	3
2	تكنولوجيا المحاكاه	DPE 407	3	مشروع مختار ٢	DPE 404	٢
3	المتحكمات الدقيقة	CSE401	2	أنظمة قوي الموائع	MPE 405	٣
4	تطبيقات الحاسب في الميكاترونيات	DPE 401	٢	إختياري هندسي ٣	xxxxx	٢
5	التصميم والتصنيع المدعم بالحاسب	DPE 406	٣	إختياري هندسي ٤	xxxxx	٢
6	إختياري هندسي 2	xxxxx	2	إختياري هندسي 5	xxxxx	2
Total			١٤	Total		1٤

Description of Course Contents and Details

Course Contents and Details for Mechatronics Engineering Program

LEVEL (000) Semester 1

Freshmen LEVEL 000 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP001	Engineering Mathematics 1	None	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn the main concepts of differentiation and algebra.										
Topics	Functions-Elementary functions-Inverse function-Polar and parametric coordinates-Limits-Newoton's method-Derivatives (chain rule, derivation of implicit and inverse functions)-Macclaurin's and Taylor's expansins-Theory of equations-Matrices-Gauss elimination method-Matrix Eigen value problem.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP002	Engineering Physics 1	None	3	٢	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn about matter properties and applications of Newton's laws.										
Topics	Field of gravitational force-Fluid statics and dynamics-Viscosity-Elasticity-Heat and Temperature-First law of thermodynamics-Heat engines-Entropy-Second law of thermodynamics-Gas theory-Sound waves-Waves in elastic media-Experiments: Simple pendulum-Complex pendulum-Liquid viscosity-Liquid surface tension-Coefficient of heat conduction-Specific heat. **Lab** : Simple and compound pendulum – Hook's law – measurement of coefficient of viscosity of liquid - surface tension – measurements of thermal conductivity – measurement of the specific heat of solid bodies.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP003	Engineering Mechanics (1)	None	2	1	1	2	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn the basic concepts of engineering mechanics.										
Topics	Vector applications-Resultant and Moments of a group of forces-Equivalent forces-Equilibrium-Reaction-Friction-Vector calculus-Equilibrium of trusses, frames, and simple machines-Experiments: Equivalent forces-Friction.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE011	Eng. Drawing & Projection (1)	None	3	2	-	3	5	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	Introductory concepts of engineering drawing and descriptive geometry										
Topics	Introduction (drawing instruments and their use)-Engineering graphics, techniques and skills-Geometric constructions and tangency-Rules and conventions of lines, lettering and dimensioning-Orthographic projection of engineering bodies-Frames of reference-Orthogonal projection-Representation of a straight line-Straight lines intersections-Representation of a plan-Position problems										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
ENE001	Eng. Chemistry	None	3	2	-	3	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn basic concepts of chemistry										
Topics	The atomic structure and its bearing on chemical and nuclear changes-chemical formulae-Percent composition-Thermochemistry-Chemical equilibrium-The gaseous state-Solutes-Electrolytic dissociation & ionic equilibrium-Chemical kinematics & rate of reactions-Sources of elements-Chemical industries-Building materials and ceramics industries-Corrosion-Fuels-Combustion-Experiments: Identification of simple salts-Identifications of acids.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
TFL001	Tech. Foreign Language	None	2	1	2	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (UR)										
Objective	To learn basics of foreign (English) technical language.										
Topics	Introduction: Basic concepts of technical English-Review of essentials of grammar and mechanics rules for effective Sentences-Style errors. Building Paragraphs: Main idea-types of paragraphs-Reading and analysis of technical passages that cover engineering disciplines for developing communication skills.										

LEVEL (000) Semester 2

Freshmen LEVEL 000 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP005	Engineering Mathematics 2	None	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn the main concepts of differentiation and algebra.										
Topics	Indefinite integration-Methods of integration-Definite integrals-Applications (arc length, areas, volumes, center of gravity, first order differential equation)-Numerical methods of integration-Transformations in plane-partial differentiation-Conic sections-Frames of work and different kinds of systems of coordinates-Straight line in space-Plane in space-Surfaces of the second degree-The general equation of the surfaces of the second degree.										

Freshmen LEVEL 000 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP006	Engineering Physics 2	None	3	٢	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn the main concepts of integration and analytical geometry.										
Topics	Charge and matter-Electric field-Gauss law-Electric potential-Capacitors and dielectrics-Current, resistance and electromotive force-Magnetic field-Ampere's law- (Biot-Savart) law-Fraday's law of induction-Inductance magnetic properties of matter-Physical optics-Interference and deflection-Laser physics-Electromagnetic induction-Properties of magnetic materials-A/C current-Electromagnetic waves-Experiments: Capacitor capacity-Magnetic field-Ohm's law-Sonic speed **Lab :** Verification of Ohm's law – measurement of capacitance of a capacitor – measurement of magnetic field and magnetic moment – determination of radius of curvature and focal length of a lens – measurements of refractive index of glass – microscope – measurements of light velocity ..										

Freshmen LEVEL 000 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM001	History of Eng. & Tech.	None	2	٢	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (UR)										
Objective	To learn about the history of engineering and technology										
Topics	Definitions of Art, science, technology and engineering-Civilizations and their relationship with natural and human sciences-Histyory of different technology and engineering specializations-Historical relations between science and technology-Relation between developments in engineering, social, economical and cultural environments-Practical examples on development of engineering activities.										

Freshmen LEVEL 000 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP007	Eng. Mechanics (2)	None	2	1	2	1	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	Continuing learning the basic concepts of engineering mechanics.										
Topics	Displacement, veolicity and acceleration in Cartesian, curvilinear, tangential, polar and cylindrical coordinates-relative motion-projectiles-Motion under centrifugal forces-Work-Energy-Momentum-Impulse and collision-Experiments: Momentum conservation-Projectiles-Free falling.										

Freshmen LEVEL 000 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 012	Eng. Drawing & Projection (2)	DPE011	3	2	-	3	5	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	Continuing learning of engineering drawing and descriptive geometry.										
Topics	Pictorial drawing of engineering bodies-Derivation of views of a given body-Derivation of a missing view from two given views-Rules of sectioning and sectional views-Drawing of steel sections-Auxiliary projection-Circle-Helix-Helical surfaces-Polyhedra-Sphere-Cone-Cylinder-Plane section of surfaces-Intersection of two surfaces of revolution.										

Freshmen LEVEL 000 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE001	Production Technology	None	3	2	1	2	5	50	30	50	100
								20%	30%	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn the main concepts of production technology										
Topics	Introduction in industrial safety-Engineering materials (types and properties)-Metallic alloys-Casting processes-Forming processes (forging, rolling, drawing, extrusion and spinning)-Joining processes (riveting, welding and adhesive bolding)-Cutting processes-Machining processes (turning, shaping, drilling, milling and grinding)- Measuring tools (vernier calipers and micrometers)-Introduction to production costs and management systems-Practical practicing.										

Freshmen LEVEL 000 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CSE001	Introduction to Computers and Programming	None	2	1	1	2	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (UR)										
Objective	To learn basic concepts of computers and high-level programming languages.										
Topics	Information processing-Computer building blocks - Problem solving (Algorithms and flow charts) – Programming languages- Applications: Mathematical analysis, business and administration, application in industry and communications, *etc*.										

LEVEL (100) Semester 3

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP101	Engineering Mathematics 3	EMP005	٢	١	2	-	٣	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	Knowledge of the methods and applications of advanced mathematics.										
Topics	Vectors, matrix, differential equations, eigenvalue problems, linear systems of equations, complex calculus, Fourier ranks, Fourier transformation, Fourier analysis, Laplace transformation, z-transformation.										

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE101	Mechanics of Machines	EMP007	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	Study and analyze kinematics and dynamics of rigid bodies.										
Topics	**Statics:** Center of gravity, center of mass, and the centroid of a body –Theorems of Pappus and Guldinus – Mass moment of inertia and parallel-axis theorem – Radius of gyration - Principle of virtual work for a system of connected rigid bodies – Conservative forces and potential energy and - Stability of equilibrium configuration. **Dyamics:**Planar kinematics of a rigid body – Absolute motion analysis – Relative motion – Instantaneous center of zero velocity –Planar kinetic equations of motion for translation, rotation about a fixed axis and general plane motion – Principle of work and energy for a rigid body– Conservation of energy– Principle of impulse and momentum of a rigid body –Conservation of momentum										

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE10٢	Thermodynamics	None	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Objective	This course aims to compare the quality of energy in various forms, to understand how thermodynamic systems are constructed and used in the world and to perform a first law analysis (cycle analysis) on the systems producing power or heating/cooling effect, to comprehend the thermodynamic property relations and to calculate property data using fundamental thermodynamic relations.										
Topics	Fundamental concepts, definition of heat and work, properties of gases, 1st and 2nd laws, analysis of closed and open systems, basic thermodynamics cycles. Introduction of gas power cycles, Otto and Diesel cycles. Brayton cycle, modifications to simple Brayton cycle. Steam cycles, Rankine cycle, methods to increase efficiency of Rankine cycles, Regenerative Rankine cycles, cogeneration, combined gas-power cycles. Introduction of refrigeration cycles, refrigerators and heat pumps, refrigerant types, some innovative vapor compression refrigeration cycles. Regenerative cycles, Thermodynamic property relations, Maxwell relations. Gas mixtures, ideal and real gas mixtures. Gas-vapor mixtures, dry and atmospheric air, specific and relative humidity, dew point temperature, adiabatic saturation and wet bulb temperature. Psychrometric chart, air conditioning processes.										

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EPE102	Circuits Theory	None	3	2	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge of the basic laws, applications and mathematic methods of calculation of electrical engineering										
Topics	Fundamental laws, continuous current, design of networks, electrical and magnetic fields, induction and flow laws, field parameters and interactions, alternating current, single and multi phases systems, behavior of electronic circuits.										

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MTE101	Materials Engineering	None	3	2	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	Knowledge of the connection between the microstructure of a material and the resulting structure and function properties. Differentiation of the characteristics of different materials including smart materials										
Topics	Atomic structure of industrial materials, lattice structure, mechanical properties, electrical properties, thermal properties, chemical properties, material testing, manufacturing methods, material damage, standardization, smart materials in mechatronics (piezoelectric materials, shape memory alloys and polymers, electro- and magnetorheological materials, electrochromic materials, smart fluids and gels, giant magnetostrictive materials, nanotubes, smart paints, thermoresponsive inorganic materials, ceramics and electroceramics). **Lap**: Mechanical tests; tension, compression, bending, torsion, impact, fatigue.										

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM101	Introduction to law	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (UR)										
Objective	Knowledge about the law bases, sources and characteristics										
Topics	Law bases and sources - General bases, sources and characteristics of the administrative Law -public administration organization - General bases of the administrative organization - centralized and decentralized administration - civil servant post.										

LEVEL (100) Semester 4

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CSE101	Computer applications	CSE001	2	1	1	2	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	Learning skills of programming complex software tools with high level programming languages.										
Topics	Overview of different programming languages, programming within C, efficient programming, object-oriented programming (for example with JAVA), software design tools. **Lab:** Computer Lab										

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP104	Numerical Techniques	CSE101	2	2	1	1	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge of the construction and analysis of algorithms for continuous mathematical problems.										
Topics	Improvement, approximation, numerical solutions of non linear systems of equations, numeric of integral equations, numerical linear algebra, numerical number theory, calculation of eigenvalues, mathematical computer programs (e.g MATLAB)										

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE102	Machine Drawing	DPE٠١٢	3	2	-	3	5	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Objective	Continuing learning of engineering drawing and descriptive geometry.										
Topics	Introduction to mechanical drawing – Types of mechanical drawing – Fits and tolerances and geometrical tolerances – Assembly and detailed drawings – Drawing of screws and threaded joints - Drawing of riveted joits – Drawing of welded joints – Drawing of keyed, pined and splined joints – Drawing of spur, helical, bevel and warm gears – Applications to assembly and detailed drawings – Introduction to Computer-Aided mechanical drawing (CAD) .										

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 104	Introduction to Mechatronics	None	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Objective	To learn the basic concepts of mechatronics										
Topics	Methodology of analysis and design of mechatronic system, electromechanical and electromagnetical actuators, shape memory alloys (SMA), artificial muscles using SMA, piezoelectric actuators, pneumatic actuators, electropneumatic systems (FLUID – SIM software), analysis of actuator dynamics using field-circuit methods										

Elective (1) Humanities

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM103	History of Arabian and Islamic Civilization	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University Elective (1) (UR)										
Objective	Knowledge of the history of arabian and islamic civilization										
Topics	Defining civilization in general - theories and terminology - Short account of the Arabic community pre-Islam - setting up the Islamic society -'Its development and main 'features - Islamic Civilization - the basic moral and material concepts - ethical values - the basic concepts - the main characteristics - the Arabian Islamic achievements in the fields of science knowledge and culture - the Arabian contribution to the world. civilization an human progress - the contemporary Arab -Islamic World										

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM104	Geography of Mankind & Environment	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University Elective (1) (UR)										
Objective	Knowledge of the geography of mankind & environment										
Topics	Environment of the contemporary man - the role of man in changing the environment Analytical studies for models of the environment - some environmental problems - overpopulation and food shortage -'Pollution - depletion of the natural resources – desertification.										

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM102	Human Resources Management	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University Elective (1) (UR)										
Objective	Knowledge of the human resources management.										
Topics	Activities of HR management - HR planning: Job analysis, Demand for HR, Supply of HR – Staffing: Recruitment, Selection – Training and development – Performance Appraisal – Compensation: Type of equity, Designing the pay structure, Employee benefits – Labor/management relations – Motivation - Leadership – Communication.										

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM105	Introduction to Logic	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University Elective (1) (UR)										
Objective	Knowledge of the logic and relation with the other sciences										
Topics	Definition of logic and its relation with the other sciences – types of various deductions - modern Logic and the various methods of research - Mathematical Logic –prepositional, relationships, form and predicate Logic.										

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours				Marks				
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE103	Stress Analysis	MTE101	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge about stress analysis under different loadsfor different mechanical elements and failure theories.										
Topics	Stress-strain relationship and Hook's law – Axial stresses – Torsional stresses – Bending stresses in beams – Shear stresses in beams, shear flow and shear center – Combined stresses and Mohr circle – Stresses in thick and thin cylinders – Introduction to thermal stresses and the generalized Hook's law – Failure theories and their applications. Deflection in beams.										

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours				Marks				
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EPE101	Electrical systems	None	2	1	2	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	Knowledge of the different types of electrical machines, DC machines, and steady state performance charachteristics, testing of all types of DC machines.										
Topics	Magnetic circuit analysis - types of DC generators - construction - theory of operation - steady state performance characteristics - types of DC motors - construction - theory of operation - torque and EMF equations - motor characteristics - starting - speed control - braking - testing of all types of DC machines - single-phase transformers - construction - theory of operation - transformation ratios of voltage and current - equivalent circuit - phasor diagram - losses - efficiency - voltage regulation - daily efficiency - parallel operation of transformers - auto transformers - current transformers - voltage transformers - basic DC machines - types of DC machines: MMF, EMF, and steady state performance analysis - parallel operation of generators - types of starters - testing of DC machines - special DC machines										

LEVEL (200) Semester 5

Faculty elective (1)

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE208	Engineering Project Management	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Faculty Elective (FR)										
Objective	Competence to plan , lead and successfully close projects										
Topics	Project management, settlement of projects, timetable, cost planning, management models, human resources management.										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
INE208	Quantitative Methods in Engineering	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Faculty Elective (FR)										
Objective	• To understand definition, scope, objectives, phases, models & limitations of operations research. • To understand different application areas of operations research like transportation problem, assignment model, sequencing models, dynamic programming, game theory, replacement models & inventory models. • Formulate simple reasoning, learning and optimization problems, in terms of the representations and methods presented.										
Topics	Historical study of operation research. Linear Programming: Methods to solve LP models. The simplex methods: Degeneracy and cycling. Artificial variables. Further topics in linear programming: Duality. The dual simplex method. Sensitivity analysis. Methods of solving transportation and assignment problems. Game theory. Network analysis. Solution of CPM and PERT problems by mathematical methods and using CP model queuing theory.										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
ENE202	Environmental Evaluation of Engineering Projects	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Faculty Elective (FR)										
Objective	**Students should be able to:** • Effectively use basic engineering economics tools to evaluate major infrastructure projects. • Understand when to complement this basic analysis with more sophisticated tools. • Critique the process used to evaluate typical infrastructure projects. • Understand a broad range of project types of relevance to Civil and Environmental Engineering and related fields. • Understand some ways in which project performance can be measured and improved. • Understand the role of uncertainty in project evaluation. • Do an end-to-end project evaluation.										
Topics	This course covers methodologies for evaluating engineering projects, which typically are large-scale, long-lived projects involving many economic, financial, social, and environmental factors. Students learn the basic techniques of engineering economics, including net present value analysis, life-cycle costing, benefit-cost analysis, and other approaches to project evaluation.										

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE203	Theory of Machines and mechanisms	DPE101	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge about the theory of machines. Basic terms and definitions for rotation scenes.										
Topics	Machine kinematics, position and displacement, velocity and acceleration; static and dynamic forces, Cam profile and cam design, gears and gear train, balance of rotating reciprocating masses, flywheels.										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE201	Fluid Mechanics	DPE101	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge about fluidic streams and their properties										
Topics	Definition and properties of fluids, mass transfer, laminar and turbulent streams, friction, measurement technologies, aerodynamic, hydrostatic, conservation equations. **Lap:** Linear Momentum. The Energy Equation in a Venturi-Type Flow; Friction in Laminar and Turbulent Pipe Flow; The Hydraulic Jump										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
ECE201	Electronics Engineering	None	3	2	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge about components and structure of semiconductor materials										
Topics	Semiconductor materials: General structure, conductivity, Continuity equation P-n Junction the currents components (drift and diffusion), diffusion capacitance, breakdown phenomena. p-n junction circuit and its applications. Transistor BJT: general structure, operation, characteristic and model, the equivalent circuits (DC and small signal model), applications Transistor FET: general structure, operation, characteristic and model, the equivalent circuits (DC and small signal model), applications Transistor MOSFET: general structure, operation, characteristic and model, the equivalent circuits (DC and small signal model), applications Experimental Measurement devices calibration, Oscilloscope and its measurements, measurement of pn junction ch/s diode applications, zenar diode ch/s, BJT CH/s and method of its connections, resonance circuit and the quality factor.										

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
INE202	Engineering Statistics	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	By the end of the course, the students will be able to: 1. Demonstrate the ability to apply fundamental concepts in exploratory data analysis 2. Design studies for obtaining data whilst avoiding common design flaws that incur bias, inefficiency and confounding 3. Understand the concept of the sampling distribution of a statistic, and in particular describe the behavior of the sample mean. 4. Apply inferential methods relating to the means of normal distributions. 5. Demonstrate an appreciation of one—way analysis of variance (ANOVA). 6. Interpret and analyses data that may be displayed in a two—way table										
Topics	Introduction to descriptive statistics, theory of central tendency, probability theory, random variables, discrete and continuous random variables distribution, sampling, estimation methods, test of hypothesis, linear regression, non-linear correlation, correlation analysis, analysis of variance, and statistical application in engineering										

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE204	Manufacturing processes	DPE001	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Objective	Learning the different manufacturing techniques.										
Topics	Examination of metal cutting processes including turning, shaping, drilling and milling. Mechanics of cutting, chip formation, shear plane, velocity relations, merchant circle, tool material, tool wear, tool life, economy in metal cutting. Casting: Types of foundries, steps in making a casting; cast metals; types, materials and allowances of patterns; moulding processes and materials; gating and risering; casting defects. Forming: Metal forming process classification, basic metal working concepts and plasticity; yield criterion; slip line fields; estimation of force and energy requirements; technology of bulk and sheet metal forming processes; precision forming processes; features of different types of metal forming dies; principles of powder forming. Welding: Welding processes; welding energy sources and their characteristics; fluxes and coatings; weldability and welding of various metals and alloys; metallurgical characteristics of welded joints; weld testing and inspection. Course project.										

Elective (2) Humanities

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 201	Introductory Mass Communication	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (2) (UR)										
Objective	Knowledge of the mass communication.										
Topics	General introduction- concept of Mass Communication- history of Mass Communication- structure of the functions of Mass Communication - mass media and technology- Ethics and traditions of Mass Communications.										

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 202	Introductory Sociology	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (2) (UR)										
Objective	Knowledge of the basic concept of sociology.										
Topics	Community - Social relations - primary and secondary groups - Models .of topics in Sociology - the sociologist - Social control - Planning and development - Research curricula and tools in Sociology - Surveys in Sociology.										

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 203	History of Ancient Egypt	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (2) (UR)										
Objective	To learn bases and nature of the Ancient Egyptian history.										
Topics	Earth: natural resources and wealth - bases and nature of the Egyptian history - Stone ages (ancient, medieval and modern) prehistoric age - Ancient state - the first medieval age - medieval age - the second medieval age - modern state - the third medieval age - the late periods of independence.										

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 204	Introductory Psychology	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (2) (UR)										
Objective	To learn the basic concepts of psychology.										
Topics	Nature of psychology - motives - emotions - attitudes depression, and personal stress - conscientiousness and psychotherapy - recall and forgetfulness.										

LEVEL (200) Semester 6

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
INE207	Engineering Economy	None	2	1	2	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn the basic concepts of engineering economics.										
Topics	Engineering economics – Supply, Demand and Production - Cost and Competitions - Value Engineering- Alternative Analysis -General accounting-Cost accounting - Time Value of money - Balance sheet – Depreciation-Investment Evaluation.										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
ECE202	Electronic Circuits	ECE201	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge about the design and components of electronic circuits.										
Topics	Controlled sources, graphical network analysis, semiconductor circuits and operation points, low level signal descriptions and equivalent circuits, basic circuits with FETs and bipolar transistors, logic components, frequency attenuation circuits and Bode diagram, operation amplifier circuits, AD and DA converters, power amplifier, heat sinks.										

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE202	Machine elements Design	DPE102& DPE103	3	2	3	-	5	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge about different machine elements, their application and methods of design under different static and fatigue loads.										
Topics	Fundamentals of machine design – Fits and tolerance, geometrical tolerances and machine marks – Design considerations: design criteria, selection of materials, dimensions and shapes, production, assembly and maintenance … etc. – Design for statis loads – Design for dynamic loads and fatigue strength – Design of riveted joints – Design of power screws and threaded joits – Design of welded joints – Design of helical and leaf springs – Design of shrink-fitted joints – Design of axles and shafts for strength, rigidity and critical speed design criteria										

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE201	Mechanical Vibrations	EMP101 & DPE101	3	2	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge of Mechanical Vibrations and Noise										
Topics	Introduction and definitions, Sources and causes of vibrations, Free and forced vibrations of Single DOF systems, Harmonic and general forced vibrations of Single DOF systems, Free and forced vibrations of two - DOF systems, Vibration control methods and vibration absorbers, Continuous systems, Multi - DOF systems and natural frequencies and mode shapes, Vibrations measurement methods, Application of computer simulation and case studies. Course project. **Lab.:** **1-** Practice on simulation and animation of Mass - Spring - Damper System using Matlab and Lab view Packages. **2-** Use of computer graphics for animation of Resonance Frequency, Beating Phenomena, base excitation, etc. **3-** Practice on Vibration measuring instruments: Exciters, Analyzers, Oscilloscopes, Accelerometers, strain gauges,…etc. **4-** Practice on vibration absorbers and vibration control. **5-** Practice on vibration Isolation. **6-** Computer Oriented course project on practical case studies.										

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE202	Heat and Mass Transfer	MPE102	3	2	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	To learn the fundamentals of heat transfer methods										
Topics	Introduction to heat transfer - Heat Transfer Modes - Introduction to conduction heat Transfer- One dimensional conduction - Two dimensional conduction - Transient conduction - Introduction to convection heat transfer - External flow - Internal flow - Natural convection - Empirical relations for convective heat transfer coefficient Radiation heat transfer - Introduction to heat exchangers. **Lab.:** Determination of Thermal Conductivity of a Metal Rod. Determination of Overall Heat Transfer Coefficient of a Composite wall. Determination of Heat Transfer Coefficient in a free Convection. Determination of Heat Transfer Coefficient in a Forced Convention Flow through a Pipe. Determination of Emissivity of a Surface.										

Senior 1 LEVEL 300 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CSE 202	Digital Logic Design (DLD)	ECE201	3	2	1	1	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge about the components and the design of digital circuits										
Topics	Basic logic circuits, combinational circuits, sequential circuits, basic hardware components: flip-flops, logic gates, classical design methods for digital logic, digital hardware: Complex Programmable Logic Devices (CPLD), Application Specific Integrated Circuits (ASIC), Field Programmable Gate Arrays (FPGA), Basics of structured hardware design, introduction in hardware description languages (HDL), synthesis and simulation, realisation and test, HDL examples (VHDL, Verilog)										

LEVEL (300) Semester 7

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE308	Measurements & Instrumentation	MPE201	2	2	-	2	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	Skill to implement measurement- technology methods during experiments and in industrial applications.										
Topics	Test readings, errors, measurement of electrical and non-electrical quantities, movements, bridges, compensators, time and value discretization, sampling, industrial analog-digital converters, digital systems, software.										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CSE301	Microprocessors	ECE202	2	2	-	1	3	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	Microcontroller , types, programming and design										
Topics	a- Microprocessors: Architecture of the microprocessors, the programming language C, instruction handling, memory management, process management, virtual memories, process periphery, safety mechanism interrupt handling, system interfaces, assembler programming, IOs b- Microcontrollers: Definition of microcontroller and Embedded Systems – types and construction of the microcontroller- The construction of microcontroller – microcontroller volumes – Programming environments.										

Engineering Elective (1)

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE309	Internal Combustion Engines	Level 300	٣	2	٢	-	٤	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (١) (MR)										
Objective	Knowledge about internal combustion engines.										
Topics	Reciprocating ICEs: Theoretical Air and Gas Cycles, Fuels for ICE, Admission and Compression, Combustion Process in ICE, Combustion Knock and Knock Rating, Expansion and Exhaust, Power Output, Supercharging. Heat Loss Through Cylinders and Piston, Performance, Emission, Engine systems Design. Gas Turbine Power Units. Special Design Engines.										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE310	Renewable Energy	MPE101& LEVEL300	٣	2	٢	-	٤	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (1) (MR)										
Objective	Knowledge of types and concepts of renewable energy systems										
Topics	Solar energy engineering (conversion systems to electrical energy, conversion systems to heat energy by central reciver, heat conversion systems, heat storage systems) - Wind Energy engineering (Wind power Wind turbine operation, small machines, large machines, Types of horizontal and vertical axis) – geothermal energy engineering.										

Senior 1 LEVEL 300 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
INE 301	Manufacturing Management	Level 300	٣	2	٢	-	٤	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (١) (MR)										
Objective	Knowledge about the planning of manufacturing processes, and quality aspects										
Topics	Production planning and control, systematics, standardization, quality planning, quality control, quality assurance, quality improvement, computer-aided quality management, guidelines and standards										

Senior 1 LEVEL 300 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EPE 302	Power electronics	ECE 201	3	2	1	1	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge about power electronic network design, multi phase systems and power electronic control systems										
Topics	Basics of power electronics, multi phase systems, pointer diagrams, power semiconductors, center circuits, bridge circuits, commutation procedures, load versions, power converter transformations, direct converters, reverse converters, net controlled converters, single and multi quadrant controllers, current and voltage indirect converters, control theories, EMC problems. **Lab.:** Characteristics of Thyristors and Triacs. Experimentation on Single - Phase Semiconverters and Full Converters Feeding Resistive Loads. Experimentation on Three - Phase Semiconverters and Full Converters Feeding Resistive Loads. Power Factor Improvement Using Extinction Angle, Symmetrical Angle and Pulse - Width - Modulation Control. Experimentation on Single - Phase and Three - Phase AC Switches. Experimentation on Step - Down and Step - Up Choppers with RL Loads. Experimentation on Single - Phase and Three - Phase Inverters. Characteristics and Speed Control of a DC Motor Fed by Bridge Rectifier.										

Senior 1 LEVEL 300 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 301	Mechanical Systems Design	DPE202	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge about different mechanical systems, its components, application and methods of design under different static and fatigue loads.										
Topics	Fundamentals of power transmition elements design – Design of rolling bearing – Design of sliding bearing – Design of rigid and flexible couplings - Design of brakes and clutches - Design of flat and V belts – Design of sprockets and chains – Design of spur, helical, bevel and warm gears.										

Senior 1 LEVEL 300 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 302	Mechatronics Systems Design	ECE 201 & DPE202	3	2	2	-	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	To learn about classification, operation and principle of fluid machines										
Topics	Introduction to design and development of mechatronics systems - demonstration of problem solving techniques as a macro circle - present a V - Model as a model for mechatronics machines development - Integration between V - Model and production techniques for mechatronics machines - Innovative thinking approaches. Tools and packages software used in the conceptual design and production stages eg. (AS, Matlab, Openmodelca, Labview, etc.) - various examples in design techniques: i.e.: car braking system, painting system, underground suspension system, … etc. – Course mini projects.										

Elective (3) Humanities

Senior 1 LEVEL 300 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 303	Scientific Research Methods	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (3) (UR)										
Objective	To learn about Scientific Research Methods										
Topics	Setting up, development and methods of scientific thinking - Scientific Research curricula and tools - Selecting and developing topics - deducing results - Methods of gathering and presenting data - methods of using the library - Report writing.										

Senior 1 LEVEL 300 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 301	Seminar 1	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (3) (UR)										
Objective	To learn about characteristics of good seminar presentation.										
Topics	Talks and presentations are invited from industrial establishments relevant to the program. The guest speaker should discuss the organization, management, and recent technologies implemented in his/her industrial establishment. Students exercise writing brief technical reports on the guest presentation and deliver their own presentation about the topic.										

Senior 1 LEVEL 300 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 304	Introductory Industrial Psychology	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (3) (UR)										
Objective	To learn an Introductory Industrial Psychology										
Topics	Definition of fields and aims of Psychology and its importance in practical life - Bases of human behaviour and motives - conscientiousness, learning. and recall - intelligence and thinking - harmony in personality - Applying principles of Psychology in the fields of Industrial Psychology - realizing convenience between the individual and, his profession - Analyzing work - Selecting the individual - Industrial training and its Psychological bases - Group interaction within the Industrial organizations.										

Senior 1 LEVEL 300 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 305	Introductory Industrial Sociology	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (3) (UR)										
Objective	To learn an introduction of Industrial Sociology										
Topics	Concepts of the social structure - levels of the social, cultural and bringing up relations - Processes of organizing the social systems and the social change social cases related to industry and industrialization in the developing countries - the necessary social requirements to face the industrialization challenges - the contemporary theories of the industrial organizations and its suitability with the facts of the developing countries - analyzing the relation 'between industrialization and the social systems - Analyzing the relation between industrialization and the urban development in Egypt.										

LEVEL (300) Semester 8

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE308	Control Theory	DPE 201	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge to describe dynamic systems in the time or frequency domain and of the usual design methods for technical control systems										
Topics	Basic terms of control theory, system properties, modeling, specification methods for the time and frequency domain, transfer functions, frequency response, Nyquist-criteria, stability, leadership and disturbance behavior , control circuit design, design of standard controllers, Ziegler-Nichols adjustment procedures, computer aided design of control circuits, basics of rapid control prototyping										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CSE 304	Drives and Actuators	DPE 302	3	2	1	1	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge about common industrial actuators and drives										
Topics	Power electronics, electric drives, electrical models, pneumatic and hydraulic actuators, sensors and circuits, control design, circuit diagram design, thermal initiated actuators, piezo actuators, micro actuators										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
ECE 305	Theory of Integrated Systems	ECE202	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge about system solutions with integrated circuits										
Topics	Basics of atom, molecular- and solid state physics, basis technologies, function layers, volume micro mechanics, surface micro mechanics, thick-film technology, layout and joining techniques, LIGA techniques, applications, design, simulation, maximum utilization of the chip surface, processing speed										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 306	Robotics (1)	DPE203	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge about the application of modern robotics systems in an industrial enironment.										
Topics	Introduction to Robotics Technology, Robot structures and components, Kinematics of planar robots, Kinematics of 3-D robots and homogeneous transformation. Computer simulation and practical training. Robotics programming languages, applications, tools to use with robots, software- tools. Course project.										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE302	Turbo Machinarey	MPE101	3	2	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	To learn about classification, operation and principle of fluid machines										
Topics	Introduction ; similitude of fluid machinery- Principle relation (head dynamic, fluid mechanics, efficiency)- Classification of turbomachinery- Cassadine 2D analysis- Hydraulic pumps (dynamic and net positive displacement)- Cavitation – hydraulic turbine (pelton wheel – radial turbine)- Best design point – off design perfomance – steam turbine -Compressor fan -Axil compressor and fans (two-Dimensional analysis) - Axial compressor and fans (three Dimensional analysis) - Centifugal compressors and fans (two-dimensional analysis) - Radial inflow turbines. - Transonic and supersonic turbomachinery - Computational techniques in turbomachinery -Net postive displacement machines										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CSE302	Logic Controllers	ECE202	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge about the electronic components for controlling and regulation of industrial machines										
Topics	Structure and functions of PLCs, center components, IOs, data communication, binary control systems: logic control and sequential control, digital control systems: IEC 1131-3 programming languages, basics of control safety and availability, engineering tools										

Senior 1 LEVEL 300 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE307	Modeling and Simulation	EMP104+ DPE302	2	2	-	1	3	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	Skill to build mathematical models of Mechatronics systems										
Topics	a- Modelling: Relevance of simulations, mathematical background, numerical methods, description of differential equations, block diagrams, system identification, display of mechanical and electrical components, modelling, subsystems, enclosure of systems b- Simulation Technology: Choose of simulation instruments, development of simulations, simulation techniques, simulation of complex systems, step size problems, application of the different solving methods, different software tools (Pspice, Mathcad, Matlab-Simulink, Simplorer, Dymola,…), Programming of simulation tools										

LEVEL (400) Semester 9

Senior 2 LEVEL 400 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 401	Computer Applications in Mechatronics	CSE101	٢	١	-	٣	٤	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	To learn about Computer Applications in Mechatronics										
Topics	Computer graphics, Experimental versus computational methods, Principle of optimization, MATLAB toolboxes (SIMULINK Neural, …).										

Senior 2 LEVEL 400 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CSE401	Microcontrollers	Level 400	2	2	-	1	3	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	Microcontroller , types, programming and design										
Topics	Programming environments –Microcontroller design (Intel 8742 or others).										

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE406	CAD/CAM	DPE202	3	2	-	3	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge of CAD/CAM fundamentals and CAD/CAM software design.										
Topics	Fundamentals of computer-aided design – Techniques and tools of computer-aided design - Software design with application to mechanical elements - The finite element method: computer-aided design of bars, beams, trusses, frames, and 2D plane stress, plane strain and axisymmetric problems - Introduction of optimum design – functional and production-oriented dimensioning of mechanical components in a CAD-program, requirements to the manufacturing process. **Lab.:** Part modeling and geometry construction using a CAD tool – Design of CAD software used in the design of machine elements – Strength and rigidity analysis of structural elements.										

Engineering Elective (2)

Senior 2 LEVEL 400 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 409	Fluid Power Control	MPE201& LEVEL400	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (2) (MR)										
Objective	To learn the fluid power systems and their control systems										
Topics	Introduction to Fluid Power Systems - Valve Controlled Drives - Hydraulic and Pneumatic Valves - Valve Configurations - Steady-State Valve Operating Forces - Transient Forces and Valve Stability - Servo Valves with Feedback - Analog and Digital Closed-loop Control.										

Senior 2 LEVEL 400 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 408	Electro Mechanics & Motion Control	Level 400	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (2) (MR)										
Objective	Learn about the electromechanical systems componentsand chacracteristics.										
Topics	Principles of electromechanical energy conversion, motion actuators: solenoids, stepping motors, DC motors, BLDC motors, induction motors, synchronous motors, switched reluctance motors, Toroidal torque motors, servos and synchros, linear induction motors, transformers for power, signal and pulse processing. Characteristics of machines: braking, four quadrant operation with power conditioners. Power amplifiers: linear and PWM, Power Operational amplifiers, Choppers, rectifiers, inverters and cycloconverters.										

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE410	CNC Machines & Material Cutting Processes	Level 400	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (2) (MR)										
Objective	To learn about mechanics of metal cutting and nonconventional machining processes and CNC machines.										
Topics	Mechanics of metal cutting, shear plane theories in continuous chip cutting, discontinuous chip formation theories, tool wear and tool life, cutting temperature, roughness of machined surfaces, economic of cutting processes, dividing and dividing heads, gear manufacturing and measurements, screw thread manufacturing and measurements, cam manufacturing, abrasive machining processes, non-conventional machining processes, CNC Machines: types, specification, programming and operation. Practical training.										

Senior 2 LEVEL 400 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 407	Simulation Technology	DPE 307	3	2	-	3	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Objective	Knowledge of how to create a simulation of a technical system with modern software tools										
Topics	Choose of simulation instruments, development of simulations, simulation techniques, simulation of complex systems, step size problems, application of the different solving methods, different software tools (Pspice, Mathcad, Matlab-Simulink, Simplorer, Dymola,…), Programming of simulation tools.										

Senior 2 LEVEL 400 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 402	Graduation Project 1	CSE001+ Completed ١٢٠ CH	٢	١	-	3	٤	50	50	-	100
								50%	50	-	100%
Category	Compulsory (MR)										
Objective	To learn and work as ateam work to design and manufacturing applications on mechatronics engineering projects										
Topics	The content of this course is variable and therefore it is repeatable for credit. Students collaborate with faculty research mentors on an ongoing project in a faculty member's laboratory or conduct independent research under the guidance of a faculty member. This experience provides students with an inquiry based learning opportunity and engages them as active learners in a research setting. Arrangements must be made with a specific faculty member before registration.										

LEVEL (400) Semester 10

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 403	Robotics (2)	DPE 306	3	2	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (UR)										
Objective	To learn about Robotics system and control										
Topics	- Introduction, Robot arm Kinematics, Robot arm Dynamics, Lamberts eqns. of motion Planning of manipulator trajectories - Control of Robot Manipulators Near- minimum time control, Variable structure control Nonlinear Decoupled Control. - Robot Programming Language, Robot intelligence & task planning, Robot reaming.										

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 405	Fluid Power Systems	MPE202	3	2	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (UR)										
Objective	To learn about fluid power systems and its applications.										
Topics	Fluid power transmission; actuation and control – Properties of hydraulic fluids – Positive displacement pumps and motors; types, static characteristics of constant and variable geometric volume units, flow rate, torque and power – Cylinders – Pressure, flow, and directional control valves; direct and pilot operated, static flow forces acting on poppets and spools, static characteristics of valves – Accumulators – Accessories – Throttling and non-throttling systems –Basics of design of fluid power systems and examples from industrial and mobile applications – Course project.										

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 404	Graduation Project 2	MPE 402	2	1	-	3	4	50	50	-	100
								50%	50%	-	100%
Category	Compulsory (MR)										
Objective	To learn and work as ateam work to design and manufacturing applications on mechatronics engineering projects										
Topics	Continuation of project activities started by MPE 402.										

Engineering Elective (3)

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CSE 405	Image Processing and Computer Vision	Level 400	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (3) (MR)										
Objective	To learn about Image Processing										
Topics	- Image Processing, Image Representation, Description of Line & Shape, Descriptive Methods in Scene Analysis, Hardware & Software Considerations.										

Senior 2 LEVEL 400 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
ECE 406	Embedded Systems Design	Level 400	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (3) (MR)										
Objective	Knowledge about the design techniques of embedded systems.										
Topics	Embedded system design process - embedded computing platform- program design and analysis- Hardware accelerators - distributed embedded architectures- system analysis and architecture design- Design example – Programming project.										

Senior 2 LEVEL 400 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 411	Vehicle System Dynamics and Control	DPE301& LEVEL400	2	2	1	-	3	50	-	50	100
								50%	-	50%	100 %
Catogary	Engineering Elective (3) (MR)										
Objective	To learn about automotive engineering, design, maintenance and control.										
Topics	Automotive Chassis Layout, Frame and body Construction, I.C. Engine Construction and Components. Engine Cooling and Lubrication System, Fuel Supply System for petrol and diesel Engine, Ignition System, Clutches, Transmission System, Drive Line System, Steering System, Suspension and Shock Absorber System, Braking System, Automotive Electrical System, Maintenance, Engine Testing, Servicing and Repair.										

Engineering Elective (4)

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
ECE 404	Sensors & Signal Processing	Level 400	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (4) (MR)										
Objective	Knowledge about sensor technology, sensor systems and evaluation electronics										
Topics	Introduction and motivation, classification of sensors, sensor characteristics, analog and digital sensors, optical sensors, pressure sensors, chemical and biochemical sensors, micro mechanical sensors, test circuits and signal processing for sensor systems, future development of the market.										

Senior 2 LEVEL 400 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE409	Power Plants	Level 400	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (4) (MR)										
Objective	To learn about energy conversion systems										
Topics	Introduction to energy conversion systems – Steam power plant – Boilers – Steam turbine – Theory of combustion and fuel types – Gas turbine and combined power stations – Solar and wind energy conversion systems – Energy storage.										

Senior 2 LEVEL 400 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 412	Advanced Control Systems	Level 400	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (4) (MR)										
Objective	Knowledge about digital control systems.										
Topics	Review of Classical Control– State-space Control – Static Optimization – Dynamic Optimization – Dynamic Programming – Optimal Estimation/Kalman Filtering – Analysis, design and simulation of control systems using computers.										

Engineering Elective (5)

Senior 2 LEVEL 400 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
INE403	Industrial Safety Engineering	Level 400	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (5) (MR)										
Objective	Knowledge about industrial safety engineering.										
Topics	Upon completion of the course, the students will be equipped with concepts of engineering systems safety, dimensions of engineering systems safety, safety design and analysis mathematics, design for engineering systems safety and control for safety, and integrating safety with other operational goals such as quality and reliability.										

Senior 2 LEVEL 400 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CSE402	Artificial Intelligence	Level 400	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (5) (MR)										
Objective	Knowledge about Artificial Intelligence										
Topics	- Intelligence. in humans & machines, Basic Issues in AI, Introduction to AI Languages, Basic Search Techniques Problem Solving, Computational linguistics and natural Language Processing. - Knowledge Representation, Developments of a Knowledge base, Leaving Techniques, Knowledge Organization & Manipulation. - Production Systems, Expert Systems & Applications Computer Vision ..... etc.										

Senior 2 LEVEL 400 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
ECE 403	Digital Electronics Systems	Level 400	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (5) (MR)										
Objective	Knowledge about Signal modulation electronic circuits.										
Topics	Signal modulation electronic circuits: (Multiplier, AM, PLL,FM……..) differentiator and integrator circuit, pulse train, multi vibrator, circuit, on-off circuit, transistor as switch, negative resistor circuit, tunneling diode, silicon control rectifier and application, signal transformation: analog to digital and digital to analog transformation. Pulse code modulation circuit amplitude modulation, width modulation, position modulation and applications.										

ثالثا:

المقررات التخصصية لبرنامج هندسة الطيران والمركبات الفضائية

جدول (ز١) متطلبات التخصص لبرنامج هندسة الطيران ومركبات الفضاء (١٠٥ ساعة معتمدة بنسبة ٦٣,٦٤%)

م	الكود	اسم المقرر	الساعات المعتمدة	ساعات الاتصال			
				محاضرة	تمرين	معمل	مجموع
1	MPE 101 هقم ١٠١	Introduction to Aero-Spacecraft Engineering مدخل لهندسة الطيران والمركبات الفضائية	2	2	1	-	3
٢	DPE 209 هتج209	Space Environment بيئة الفضاء	3	2	2	1	5
٣	DPE101 هتج ١٠١	Theory of Machines نظرية الماكينات	٣	٢	2	-	4
٤	DPE102 هتج ١٠٢	Mechanics of Material ميكانيكا المواد	٣	٢	2	1	5
٥	DPE103 هتج ١٠٣	Machine Drawing رسم الماكينات	3	2	-	3	5
٦	EMP102 رفهـ١٠٢	Numerical Techniques الطرق العددية	2	2	1	1	4
٧	DPE 210 هتج٢١٠	Space Mission Analysis تحليل المهام الفضائية	2	2	1	1	4
٨	DPE201 هتج ٢٠١	Machine Element Design تصميم أجزاء الماكينات	3	2	2	1	5
٩	DPE202 هتج ٢٠٢	Modern Production Systems أنظمة الانتاج الحديثة	٣	2	2	1	5
١٠	ECE201 هكت٢٠١	Electronic Circuits الدوائر الإلكترونية	3	2	2	1	5
١١	MPE201 هقم ٢٠١	Aerodynamics الديناميكا الهوائية	3	2	2	1	5
١٢	DPE 211 هتج٢١١	Aero-spacecraft Structure Design-1 تصميم هياكل الطائرات والمركبات الفضائية-١	3	2	2	1	5
١٣	DPE 212 هتج٢١٢	Orbits & Flight Trajectory المدارات ومسارات الطيران	2	2	١	1	4
١٤	DPE203 هتج ٢٠٣	Mechanical Vibrations الاهتزازات الميكانيكية	3	2	2	1	5
١٥	DPE204 هتج ٢٠٤	Finite Elements Analysis التحليل باستخدام العناصر المحدودة	3	2	2	1	5
١٦	MPE202 هقم ٢٠٢	Gas Dynamics ديناميكا الغازات	٢	2	1	1	4
١٧	**جدول (ز٢)**	Engineering Elective (1) مقرر هندسي اختياري ١	3	2	2	1	5
١٨	MPE 301 هقم٣٠١	Design of Aircraft Propulsion Systems تصميم أنظمة دفع الطائرات	2	2	1	-	3
١٩	DPE 302 هتج٣٠٢	Aero-spacecraft Structure Design-2 تصميم هياكل الطائرات والمركبات الفضائية-٢	3	2	2	1	5
٢٠	DPE301 هتج ٣٠١	Stability and Control الثبات والتحكم	3	2	2	١	٥
21	**جدول (ز٣)**	Engineering Elective (2) مقرر هندسي اختياري ٢	3	2	2	١	٥
٢٢	**جدول (ز٤)**	Engineering Elective (3) مقرر هندسي اختياري3	٣	٢	٢	١	٥

تابع جدول (ز١) متطلبات التخصص لبرنامج هندسة الطيران ومركبات الفضاء (١٠٥ ساعة معتمدة بنسبة ٦٣,٦٤%)

٢٣	MPE 311 هقم٣١١	Design of Rocket Propulsion Systems تصميم أنظمة دفع الصواريخ	2	2	1	-	3
٢٤	DPE 312 هتج٣١٢	Computer Aided Aero-spacecraft Structure Analysis تحليل هياكل الطائرات والمركبات الفضائية بالحاسب	3	٢	2	1	5
٢٥	CSE 313 هحس٣١٣	Sensors and Actuators الحساسات والمحركات	3	2	1	2	5
٢٦	MPE301 هقم ٣٠١	Heat Transfer إنتقال الحرارة	2	٢	١	1	4
٢٧	**جدول (ز٥)**	Engineering Elective (4) مقرر هندسي اختياري4	3	2	2	١	٥
٢٨	**جدول (ز٦)**	Engineering Elective (5) مقرر هندسي اختياري5	3	2	2	١	٥
٢٩	MPE 401 هقم٤٠١	Graduation Project (1) مشروع التخرج (١)	٢	١	-	٣	٤
٣٠	MPE 402 هقم٤٠٢	Flight Mechanics and Control ميكانيكا الطيران والتحكم	3	2	2	1	5
٣١	DPE 403 هتج403	Modeling and Simulation النمذجة والمحاكاة	2	1	1	2	4
٣٢	MPE404 هقم ٤٠٤	Design of Turbo machines تصميم الماكينات المشحنة	2	2	1	-	3
٣٣	**جدول (ز٧)**	Engineering Elective (6) مقرر هندسي اختياري6	3	2	2	١	٥
٣٤	**جدول (ز٨)**	Engineering Elective (7) مقرر هندسي اختياري7	3	2	2	١	٥
٣٥	DPE 410 هتج٤١٠	Graduation Project (2) مشروع التخرج (٢)	٢	١	-	٣	٤
٣٦	DPE 411 هتج٤١١	Planning and Testing of Space vehicles التخطيط واختبارات المركبات الطائرة	2	1	١	2	4
٣٧	DPE 412 هتج412	Guidance and Control التوجيه والتحكم	2	1	1	2	4
٣٨	MPE 413 هقم ٤١٣	Navigation Systems أنظمة الملاحة	2	1	1	2	4
٣٩	DPE405 هتج ٤٠٥	Data Analysis & System Identification تحليل البيانات والتعرف علي الأنظمة	3	٢	1	2	5
40	**جدول (ز٩)**	Engineering Elective (8) مقرر هندسي اختياري8	3	2	2	١	٥
		إجمالـــــــي الســـــاعـــات =	**105**	**٧٤**	**٥٩**	**٤٧**	**180**

جدول (ز٢) قائمة المقرر الهندسي الاختياري(1) لمتطلب التخصص

م	الكود	اسم المقرر	
١	DPE205 هتج٢٠٥	Mechanics of Fibrous & Composite Materials	ميكانيكا المواد الليفية والمركبة
٢	DPE206 هتج٢٠٦	Mechanics of Composite & Micro-Structured Media	ميكانيكا الأوساط المركبة والليفية
3	DPE207 هتج٢٠٧	Analysis of Plates and Shells	تحليل الألواح والقشريات
4	DPE208 هتج٢٠٤	Failure Analysis	تحليل الإنهيار

جدول (ز٣) قائمة المقرر الهندسي الاختياري(٢) لمتطلب التخصص

م	الكود	اسم المقرر	
١	DPE 303 هتج٣٠٣	Space Mission Design	تصميم المهام الفضائية
٢	MPE 304 هقم٣٠٤	Helicopter Dynamics	ديناميكا الطائرات الهليوكوبتر
3	MPE 305 هقم٣٠٥	Helicopter Aerodynamics	الديناميكا الهوائية للطائرات الهليوكوبتر
4	MPE 306 هقم٣٠٦	Unmanned Air Vehicles	المركبات الفضائيه بدون طيار

جدول (ز٤) قائمة المقرر الهندسي الاختياري(٣) لمتطلب التخصص

م	الكود	اسم المقرر	
١	DPE 307 هتج٣٠٧	Satellite Technology	تكنولوجيا الأقمار الصناعية
٢	MPE 308 هقم٣٠٨	Aerodynamics of V/STOL	الديناميكا الهوائية للطائرات الرأسيه الاقلاع والمقلعه من ممرات قصيره
3	MPE 309 هقم٣٠٩	Instruments of Helicopters	اجهزه الطائرات الهليكوبتر
4	MPE 310 هقم٣١٠	Internal Combustion Engines	محركات الإحتراق الداخلي

جدول (ز٥) قائمة المقرر الهندسي الاختياري(٤) لمتطلب التخصص

م	الكود	اسم المقرر	
١	DPE 314 هتج٣١٤	Theory of Control	نظرية التحكم
٢	MPE ٣١٥ هقم٣١٥	High Speed Aerodynamics	الديناميكا الهوائية في السرعات الفائقة
3	DPE ٣١٦ هتج٣١٦	Basic Navigation Systems	أنظمة الملاحة الأساسية
4	MPE 317 هقم٣١٧	Solar Energy	الطاقة الشمسية

جدول (ز٦) قائمة المقرر الهندسي الاختياري(٥) لمتطلب التخصص

م	الكود	اسم المقرر	
١	DPE 318 هتج٣١٨	Structure Testing	اختبارات هياكل
٢	MPE 319 هقم٣١٩	Aircraft Instruments	أجهزة الطائرات
3	MPE 320 هقم٣٢٠	Boundary Layer Theory	نظرية الطبقة الجدارية
4	MPE 321 هقم٣٢١	Aircraft Systems and Components	أنظمة ومكونات الطائرات

جدول (ز٧) قائمة المقرر الهندسي الاختياري(٦) لمتطلب التخصص

م	الكود	اسم المقرر	
١	DPE 406 هتج٤٠٣	Nonlinear Systems & Control	النظم اللاخطية والتحكم اللاخطي
٢	DPE 407 هتج٤٠٤	Analysis and Optimization of Airplane Performance	التحليل الأمثل لأداء الطائرات
3	DPE 408 هتج٤٠٥	Aeroelasticity	المرونة الهوائية
4	MPE 409 هقم ٤٠٦	Design of Rocket Engine	تصميم محركات الصواريخ

جدول (ز٨) قائمة المقرر الهندسي الاختياري(٧) لمتطلب التخصص

م	الكود	اسم المقرر	
١	DPE 414 هتج٤١٤	Spacecraft Control	التحكم في المركبات الفضائية
٢	MPE 415 هقم٤١٥	Computational Aerodynamics	الديناميكا الهوائية الحسابية
3	DPE 416 هتج٤١٦	Missile Control Systems	أنظمة التحكم بالصواريخ
4	MPE 417 هقم٤١٧	Flight Test Techniques Laboratory	معمل إختبارات الطيران التكنولوجي

جدول (ز٩) قائمة المقرر الهندسي الاختياري(٨) لمتطلب التخصص

م	الكود	اسم المقرر	
١	DPE 418 هتج٤١٨	Thermal Analysis of Spacecrafts	التحليل الحراري
٢	MPE 419 هقم٤١٩	Missile and Projectile Aerodynamics	الديناميكا الهوائية للصواريخ والمقذوفات
3	DPE 420 هتج٤٢٠	Spacecraft design and analysis	تصميم وتحليل المركبات الطائرة
4	DPE 421 هتج٤٢١	Space Systems Engineering	أنظمة المركبات الطائرة

جدول (ز٩) نموذج إسترشادي يوضح خطة تدريس مقررات برنامج هندسة الطيران والمركبات الفضائيه

Level 000 (Freshman)						
Semester (1) Fall				Semester (2) Spring		
	Course name	Code	CH	Course name	Code	CH
1	رياضيات هندسية ١	EMP001	3	رياضيات هندسية ٢	EMP005	3
2	فيزياء هندسية ١	EMP002	3	فيزياء هندسية ٢	EMP006	3
3	رسم هندسي وإسقاط ١	DPE011	3	رسم هندسي وإسقاط ٢	DPE012	3
4	ميكانيكا هندسية ١	EMP004	2	ميكانيكا هندسية ٢	EMP007	2
5	كيمياء هندسية	ENE001	3	تكنولوجيا إنتاج	DPE001	3
6	لغة أجنبية فنية	TFL001	2	مقدمه حاسب وبرمجة	CSE001	٢
7	-------	-----	----	تاريخ الهندسة والتكنولوجيا	HUM001	٢
Total			١٦	Total		١٨

Level ١00 (Sophomore)						
Semester (1) Fall				Semester (2) Spring		
	Course name	Code	CH	Course name	Code	CH
١	مدخل لهندسة الطيران الفضاء	MPE 101	٢	ميكانيكا المواد	DPE102	٣
2	تطبيقات الحاسب	CSE101	٢	رسم الماكينات	DPE103	3
3	نظرية الماكينات	DPE101	3	أنظمة كهربية	EPE101	2
4	الرياضيات الهندسية (٣)	EMP101	٢	الطرق العددية	EMP102	٢
5	هندسة المواد	MTE101	3	الإحصاء الهندسي	INE202	2
6	مدخل إلي القانون	HUM101	2	ديناميكا حرارية	MPE102	٣
7	----------	----------	------	إختياري جامعة (١)	HUM10x	2
Total			١٤	Total		17

Level 200 (Junior)						
Semester (1) Fall				Semester (2) Spring		
	Course name	Code	CH	Course name	Code	CH
1	تحليل المهام الفضائية	DPE 210	2	تصميم هياكل الطائرات والمركبات الفضائية (١)	DPE 211	3
2	تصميم أجزاء الماكينات	DPE201	3	بيئة الفضاء	DPE 209	3
3	أنظمة الإنتاج الحديثة	DPE202	3	المدارات ومسارات الطيران	DPE 212	2
4	الدوائر الإلكترونية	ECE201	3	الإهتزازات الميكانيكية	DPE203	3
5	الديناميكا الهوائية	MPE201	3	التحليل بإستخدام العناصر المحدودة	DPE204	3
6	إختياري كلية ١	xxxxx	2	ديناميكا الغازات	MPE202	٢
7	إختياري جامعة (٢)	HUM20x	2	إختياري هندسي (١)	xxxxx	3
Total			١٨	Total		١٩

Level 300 (Senior 1)						
Semester (1) Fall				Semester (2) Spring		
	Course name	Code	CH	Course name	Code	CH
1	تصميم أنظمة الدفع في الطائرات	MPE 301	٢	تصميم أنظمة دفع الصواريخ	MPE 311	٢
2	تصميم هياكل الطائرات والمركبات الفضائية (٢)	DPE 302	3	تحليل هياكل الطائرات والمركبات الفضائية بالحاسب	DPE 312	3
3	الثبات و التحكم	DPE301	3	الحساسات و المحركات	CSE 313	3
4	الإقتصاد الهندسي	INE207	٢	إنتقال الحرارة	MPE301	٢
5	إختياري هندسي (٢)	xxxxx	3	إختياري هندسي (٤)	xxxxxxx	٣
6	إختياري هندسي (٣)	xxxxxx	3	إختياري هندسي (٥)	xxxxxx	3
7	إختياري جامعة (٣)	HUM30x	2			
Total			18	Total		١٦

Level 400 (Senior 2)						
Semester (1) Fall				Semester (2) Spring		
	Course name	Code	CH	Course name	Code	CH
1	مشروع تخرج (١)	MPE 401	٢	مشروع تخرج (٢)	DPE 410	٢
2	ميكانيكا الطيران والتحكم	MPE 402	3	التخطيط و إختبارات المركبات الطائرة	DPE 411	2
3	النمذجة والمحاكاة	DPE 403	٢	التوجيه والتحكم	DPE 412	2
4	تصميم الماكينات المشحنة	MPE40٤	2	أنظمة الملاحة	MPE 413	2
5	إختياري هندسي (٦)	xxxxxxx	3	تحليل البايانات والتعرف علي الأنظمة	DPE40٥	٣
6	إختياري هندسي (٧)	xxxxxxx	3	إختياري هندسي (8)	xxxxxxxx	3
Total			١٥	Total		١٤

Description of Course Contents and Details

Course Contents and Details for Aero-Spacecraft Engineering Program

LEVEL (000) Semester 1

Freshmen LEVEL 000 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP001	Engineering Mathematics 1	None	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn the main concepts of differentiation and algebra.										
Topics	Functions-Elementary functions-Inverse function-Polar and parametric coordinates-Limits-Newoton's method-Derivatives (chain rule, derivation of implicit and inverse functions)-Macclaurin's and Taylor's expansins-Theory of equations-Matrices-Gauss elimination method-Matrix Eigen value problem.										

EMP002	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
	Engineering Physics 1	None	3	٢	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn about matter properties and applications of Newton's laws.										
Topics	Field of gravitational Force-Fluid statics and Dynamics-Viscosity-Elasticity-Heat and Temperature-First law of Thermodynamics-Heat Engines-Entropy-Second law of Thermodynamics-Gas Theory-Sound Waves-Waves in elastic Media-Experiments: Simple Pendulum-Complex Pendulum-Liquid Viscosity-Liquid Surface Tension-Coefficient of heat Conduction-Specific heat. **Lab** : Simple and compound pendulum – Hook's law – measurement of coefficient of viscosity of liquid - surface tension – measurements of thermal conductivity – measurement of the specific heat of solid bodies.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP003	Engineering Mechanics (1)	None	2	1	1	2	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn the basic concepts of engineering mechanics.										
Topics	Vector applications-Resultant and Moments of a group of forces-Equivalent forces-Equilibrium-Reaction-Friction-Vector calculus-Equilibrium of trusses, frames, and simple machines-Experiments: Equivalent forces-Friction.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE011	Eng. Drawing & Projection (1)	None	3	2	-	3	5	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	Introductory concepts of engineering drawing and descriptive geometry										
Topics	Introduction (drawing instruments and their use)-Engineering graphics, techniques and skills-Geometric constructions and tangency-Rules and conventions of lines, lettering and dimensioning-Orthographic projection of engineering bodies-Frames of reference-Orthogonal projection-Representation of a straight line-Straight lines intersections-Representation of a plan-Position problems										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
ENE001	Eng. Chemistry	None	3	2	-	3	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn basic concepts of chemistry										
Topics	The atomic structure and its bearing on chemical and nuclear changes-chemical formulae-Percent composition-Thermochemistry-Chemical equilibrium-The gaseous state-Solutes-Electrolytic dissociation & ionic equilibrium-Chemical kinematics & rate of reactions-Sources of elements-Chemical industries-Building materials and ceramics industries-Corrosion-Fuels-Combustion-Experiments: Identification of simple salts-Identifications of acids.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
TFL001	Tech. Foreign Language	None	2	1	2	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (UR)										
Objective	To learn basics of foreign (English) technical language.										
Topics	Introduction: Basic concepts of technical English-Review of essentials of grammar and mechanics rules for effective Sentences-Style errors. Building Paragraphs: Main idea-types of paragraphs-Reading and analysis of technical passages that cover engineering disciplines for developing communication skills.										

LEVEL (000) Semester 2

Freshmen LEVEL 000 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP005	Engineering Mathematics 2	None	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn the main concepts of differentiation and algebra.										
Topics	Indefinite integration-Methods of integration-Definite integrals-Applications (arc length, areas, volumes, center of gravity, first order differential equation)-Numerical methods of integration-Transformations in plane-partial differentiation-Conic sections-Frames of work and different kinds of systems of coordinates-Straight line in space-Plane in space-Surfaces of the second degree-The general equation of the surfaces of the second degree.										

Freshmen LEVEL 000 COURSES											
EMP006	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
	Engineering Physics 2	None	3	٢	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn the main concepts of integration and analytical geometry.										
Topics	Charge and matter-Electric field-Gauss law-Electric potential-Capacitors and dielectrics-Current, resistance and electromotive force-Magnetic field-Ampere's law- (Biot-Savart) law-Fraday's law of induction-Inductance magnetic properties of matter-Physical optics-Interference and deflection-Laser physics-Electromagnetic induction-Properties of magnetic materials-A/C current-Electromagnetic waves-Experiments: Capacitor capacity-Magnetic field-Ohm's law-Sonic speed **Lab :** Verification of Ohm's law – measurement of capacitance of a capacitor – measurement of magnetic field and magnetic moment – determination of radius of curvature and focal length of a lens – measurements of refractive index of glass – microscope – measurements of light velocity ..										

Freshmen LEVEL 000 COURSES											
HUM001	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
	History of Eng. & Tech.	None	2	٢	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (UR)										
Objective	To learn about the history of engineering and technology										
Topics	Definitions of Art, science, technology and engineering-Civilizations and their relationship with natural and human sciences-Histyory of different technology and engineering specializations-Historical relations between science and technology-Relation between developments in engineering, social, economical and cultural environments-Practical examples on development of engineering activities.										

Freshmen LEVEL 000 COURSES												
EMP007	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
	Eng. Mechanics (2)	None	2	1	2	1	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Objective	Continuing learning the basic concepts of engineering mechanics.										
Topics	Displacement, veolicity and acceleration in Cartesian, curvilinear, tangential, polar and cylindrical coordinates-relative motion-projectiles-Motion under centrifugal forces-Work-Energy-Momentum-Impulse and collision-Experiments: Momentum conservation-Projectiles-Free falling.										

Freshmen LEVEL 000 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE012	Eng. Drawing & Projection (2)	DPE011	3	2	-	3	5	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Objective	Continuing learning of engineering drawing and descriptive geometry.										
Topics	Pictorial drawing of engineering bodies-Derivation of views of a given body-Derivation of a missing view from two given views-Rules of sectioning and sectional views-Drawing of steel sections-Auxiliary projection-Circle-Helix-Helical surfaces-Polyhedra-Sphere-Cone-Cylinder-Plane section of surfaces-Intersection of two surfaces of revolution.										

Freshmen LEVEL 000 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE001	Production Technology	None	3	2	1	2	5	50	30	50	100
								20%	30%	50%	100%
Catogary	Compulsory (FR)										
Objective	To learn the main concepts of production technology										
Topics	Introduction in industrial safety-Engineering materials (types and properties)-Metallic alloys-Casting processes-Forming processes (forging, rolling, drawing, extrusion and spinning)-Joining processes (riveting, welding and adhesive bolding)-Cutting processes-Machining processes (turning, shaping, drilling, milling and grinding)- Measuring tools (vernier calipers and micrometers)-Introduction to production costs and management systems-Practical practicing.										

Freshmen LEVEL 000 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CSE001	Introduction to Computers and Programming	None	2	1	1	2	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (UR)										
Objective	To learn basic concepts of computers and high-level programming languages.										
Topics	Information processing-Computer building blocks - Problem solving (Algorithms and flow charts) – Programming languages- Applications: Mathematical analysis, business and administration, application in industry and communications, *etc*.										

LEVEL (100) Semester 3

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 101	Introduction to Aero-Spacecraft Engineering	EMP 00٢	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Topics	. Introduction to Space Engineering. Flight vehicles in the atmosphere and in space. Flight technologies, including structures, materials, propulsion, aerodynamics, vehicle dynamics, flight control, flight information systems, and systems integration. An overview of aeronautics. Steady aircraft flight and performance. An overview of astronautics.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CSE101	Computer Applications	CSE001	2	1	1	2	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Topics	Overview of different programming languages, programming within C, efficient programming, object-oriented programming (for example with JAVA), software design tools										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE101	Theory of Machines	EMP007	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Topics	Centroid of Rigid bodies, Moments of inertia, Angular motion, Projectile. Dynamics of rigid body: Kinematics, Kinetics and applications of planar motion, Work and energy, Impulse and Momentum, Impact, Internal forces, Shear and Bending of Beams, Virtual work of rigid bodies, Equilibrium and stability, Planar motion, Linear and rotational motion, Energy and momentum of rigid bodies, Momentum and Impulse, Applications. Kinematics of machines; Fundamental concepts – Types of motions – Connections – Velocity and acceleration; mathematical and graphical analysis- cams – Contact between rotating bodies - rolling contact – gears and gear trains- screws- synthesis of mechanisms.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP101	Engineering Mathematics 3	EMP005	٢	١	2	-	٣	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Topics	Linear vector space- vector spaces linear independence- subspaces and spanning sets, linear maps- change of basis - Linear programming- simplex method - Curve fitting - Approximate Interpolation and polynomial. First order differential equation and their applications – Linear and higher order D.E and their applications – Partial D.E – Solution by separation of variable.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MTE101	Engineering Materials	None	3	2	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Topics	Engineering materials; an introduction: types, structure, properties, applications – Stresses and strains – Elasticity and plasticity – Standards – Mechanical testing for metallic materials (tension, compression, bending, shear, torsion, hardness, impact, fatigue, creep) – Construction materials and their tests – Testing results and evaluation reporting. Lab: Tension test for mild steel and cast iron, Compression test for mild steel, cast iron and brass, Pending test, Torsion test for mild steel and cast iron, Direct shear test, Cold bend test for mild steel, Impact test for mild steel and brass, Hardness test for mild steel, cast iron and brass, Fatigue test										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM101	Introduction to Law	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Topics	Law bases and sources - General bases, sources and characteristics of the administrative Law -public administration organization - General bases of the administrative organization - centralized and decentralized administration - civil servant post.										

LEVEL (100) Semester 4

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE102	Mechanics of Materials	MTE101	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Stress- axial loads – Statically indeterminate Structures Strain – Hook's Low – thick cylinders – Torsion - thin cylinders and pressure vessels – Axial force, shear, and bending moment – Failure theories – Pure bending of beams – Energy Theories - shear stresses in beams – Compound stresses and their applications – Analysis of plane stress and strain.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE103	Machine Drawing	DPE012	3	2	-	3	5	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Topics	Utilizes up-to-date computer-aided design software (such as Solid Work and AutoCAD) for mechanical drawings and mechanical designs to: provide a first exposure to mechanical design for engineers. Includes the nature and visual representation of mechanical components and principles of engineering drawing and sketching for mechanical design.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EPE101	Electrical Systems	None	2	1	1	2	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (FR)										
Topics	Introduction to electrical circuits - electrical installation in residential and industrial buildings (illumination networks in rural areas, data lines, telephone lines and antenna, control of air conditioning, lift) - requirements of audio systems - alarm devices (fire - security - gas).										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
EMP102	Numerical Techniques	EMP101	2	2	1	1	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Numerical solutions for linear equations- Numerical solutions for non linear equations – Numerical Solutions for ordinary differential equation – Numerical solutions for Partial Differential equation.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
INE202	Engineering Statistics	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Topics	Graphical presentation of data: Frequency distributions, Histograms, Stem-and-leaf Diagrams – Measures of central tendency: Sample mean for ungrouped data, sample mean of grouped data, weighted mean, Median, Mode – Measures of Dispersion: Variance and standard deviation for ungrouped sample data, Variance and standard deviation for grouped sample data, Range – Bivariate data: Scatter diagrams, Correlation Coefficient, Linear Regression – Probability Distributions – Sampling and sampling Distributions.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE101	Thermodynamics	None	3	2	2	-	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Topics	Concepts and definitions – Work and heat – 1st Law of Thermodynamics – Working fluid – Thermodynamic processes – 2nd Law of thermodynamics, entropy, irreversibility and availability - Mixtures - Basics of combustion - Basic cycles – Thermodynamic measurements - Ideal gases – Standard air cycles – Heat engine cycles – Theoretical and actual cycle Analysis – Power Cycles – Fuel – Biomass – Nuclear Energy – Wind Energy – Solar Energy – Geo-thermal Energy – Ocean-Energy.										

Elective (1) Humanities

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM103	History of Arabian and Islamic Civilization	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University Elective (1) (UR)										
Objective	Knowledge of the history of arabian and islamic civilization										
Topics	Defining civilization in general - theories and terminology - Short account of the Arabic community pre-Islam - setting up the Islamic society -'Its development and main 'features - Islamic Civilization - the basic moral and material concepts - ethical values - the basic concepts - the main characteristics - the Arabian Islamic achievements in the fields of science knowledge and culture - the Arabian contribution to the world. civilization an human progress - the contemporary Arab -Islamic World										

Sophomore LEVEL 100 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM104	Geography of Mankind & Environment	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University Elective (1) (UR)										
Objective	Knowledge of the geography of mankind & environment										
Topics	Environment of the contemporary man - the role of man in changing the environment Analytical studies for models of the environment - some environmental problems - overpopulation and food shortage -'Pollution - depletion of the natural resources – desertification.										

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM102	Human Resources Management	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University Elective (1) (UR)										
Objective	Knowledge of the human resources management.										
Topics	Activities of HR management - HR planning: Job analysis, Demand for HR, Supply of HR – Staffing: Recruitment, Selection – Training and development – Performance Appraisal – Compensation: Type of equity, Designing the pay structure, Employee benefits – Labor/management relations – Motivation - Leadership – Communication.										

Sophomore LEVEL 100 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM105	Introduction to Logic	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University Elective (1) (UR)										
Objective	Knowledge of the logic and relation with the other sciences										
Topics	Definition of logic and its relation with the other sciences – types of various deductions - modern Logic and the various methods of research - Mathematical Logic –prepositional, relationships, form and predicate Logic.										

LEVEL (200) Semester 5

Junior LEVEL 200 COURSES

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 210	Space Mission Analysis	MPE 101	2	2	1	1	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Mission objectives, function analysis, Function requirements, Function tree and allocation, Mission characterization.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE201	Machine Element Design	DPE103	3	2	1	3	6	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Analysis and design of machine elements, including theories of failure, fatigue strength, and endurance limits; fluctuating stresses; Goodman diagram; and fatigue design under torsional and combined stresses. Design of bolted connections, fasteners, welds, springs, ball and roller bearings, journal bearings, gears, clutches, and brakes.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE202	Modern Production Systems	DPE001	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Principle of CNC machines, CAD-CAM system, tolerances, fittings, functional and production-oriented dimensioning of mechanical components in a CAD-program, requirements to the manufacturing process, CNC machines operation and maintenance.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
ECE201	Electronic Circuits	EPE101	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Controlled sources, graphical network analysis, semiconductor circuits and operation points, low level signal descriptions and equivalent circuits, basic circuits with FETs and bipolar transistors, logic components, frequency attenuation circuits and Bode diagram, operation amplifier circuits, AD and DA converters, power amplifier, heat sinks.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE201	Aerodynamics	MPE101	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Definition and properties of fluids, Elementary potential flow, laminar and turbulent streams, friction, measurement technologies, hydrostatics, conservation equations Fundamental concepts in aerodynamics and compressible flow,one-dimensional isentropic flow; one-dimensional flow with friction and with heating or cooling; quasi-one-dimensional flow; nozzles and diffusers; shock tubes.										

Faculty elective (1)

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CUE208	Engineering Project Management	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Faculty Elective (FR)										
Objective	Competence to plan , lead and successfully close projects										
Topics	Project management, settlement of projects, timetable, cost planning, management models, human resources management.										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
INE208	Quantitative Methods in Engineering	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Faculty Elective (FR)										
Objective	• To understand definition, scope, objectives, phases, models & limitations of operations research. • To understand different application areas of operations research like transportation problem, assignment model, sequencing models, dynamic programming, game theory, replacement models & inventory models. • Formulate simple reasoning, learning and optimization problems, in terms of the representations and methods presented.										
Topics	Historical study of operation research. Linear Programming: Methods to solve LP models. The simplex methods: Degeneracy and cycling. Artificial variables. Further topics in linear programming: Duality. The dual simplex method. Sensitivity analysis. Methods of solving transportation and assignment problems. Game theory. Network analysis. Solution of CPM and PERT problems by mathematical methods and using CP model queuing theory.										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
ENE202	Environmental Evaluation of Engineering Projects	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	Faculty Elective (FR)										
Objective	**Students should be able to:** • Effectively use basic engineering economics tools to evaluate major infrastructure projects. • Understand when to complement this basic analysis with more sophisticated tools. • Critique the process used to evaluate typical infrastructure projects. • Understand a broad range of project types of relevance to Civil and Environmental Engineering and related fields. • Understand some ways in which project performance can be measured and improved. • Understand the role of uncertainty in project evaluation. • Do an end-to-end project evaluation.										
Topics	This course covers methodologies for evaluating engineering projects, which typically are large-scale, long-lived projects involving many economic, financial, social, and environmental factors. Students learn the basic techniques of engineering economics, including net present value analysis, life-cycle costing, benefit-cost analysis, and other approaches to project evaluation.										

Elective (2) Humanities

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 201	Introductory Mass Communication	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (2) (UR)										
Objective	Knowledge of the mass communication.										
Topics	General introduction- concept of Mass Communication- history of Mass Communication- structure of the functions of Mass Communication - mass media and technology- Ethics and traditions of Mass Communications.										

Junior LEVEL 200 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 202	Introductory Sociology	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (2) (UR)										
Objective	Knowledge of the basic concept of sociology.										
Topics	Community - Social relations - primary and secondary groups - Models .of topics in Sociology - the sociologist - Social control - Planning and development - Research curricula and tools in Sociology - Surveys in Sociology.										

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 203	History of Ancient Egypt	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (2) (UR)										
Objective	To learn bases and nature of the Ancient Egyptian history.										
Topics	Earth: natural resources and wealth - bases and nature of the Egyptian history - Stone ages (ancient, medieval and modern) prehistoric age - Ancient state - the first medieval age - medieval age - the second medieval age - modern state - the third medieval age - the late periods of independence.										

Junior LEVEL 200 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 204	Introductory Psychology	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (2) (UR)										
Objective	To learn the basic concepts of psychology.										
Topics	Nature of psychology - motives - emotions - attitudes depression, and personal stress - conscientiousness and psychotherapy - recall and forgetfulness.										

LEVEL (200) Semester 6

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 211	Aero-Spacecraft Structure Design 1	MPE 101	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Concepts of displacement, strain, stress, compatibility, equilibrium, and constitutive equations as used in solid mechanics. Emphasis is on boundary-value problem formulation via simple examples, followed by the use of the finite-element method for solving problems in vehicle design.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 209	Space Environment	None	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Introduction to physical and aeronautical processes in the space environment. Discussion of theoretical tools, the Sun, solar spectrum, solar wind, interplanetary magnetic field, planetary magnetosphere, ionospheres and upper atmospheres. Atmospheric processes, densities, temperatures, and wind.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 212	Orbits and Flight Trajectory	MPE 101	2	2	1	1	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Introduction to space flight mechanics. The two-body problem. Orbital transfers, maneuvers and orbital analysis. Ground tracks and relative motion in orbit. Gravity assist trajectories. Spacecraft attitude and rotational dynamics. Euler's and Poisson's equations. Stability analysis. Open loop attitude control momentum management using thrusters and reaction wheels. Introduction to spacecraft dynamics and control. Spacecraft orbit and attitude representations, kinematics, dynamics. Perturbation equations for near circular orbits. Spacecraft maneuvers formulated and solved as control problems.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE203	Mechanical Vibrations	EMP101	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Vibration motion - Free vibrations of single of degree of freedom systems – Free damped vibrations – Vibrations under external forces and their applications – two and Multi degree of freedom systems - Harmonically excited motion – Transient vibration – Properties of vibrating systems. Lab: Measurement of natural frequency of mechanical systems – measurement of damping coefficient – simple and compound pendulums.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE204	Finite Element Analysis	EMP102	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Introductory level. Finite element solutions for structural dynamics and nonlinear problems. Normal modes, forced vibrations, Euler buckling (bifurcations), large deflections, nonlinear elasticity, transient heat conduction. Computer laboratory based on a general purpose finite element code.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE202	Gas Dynamics	MPE201	2	2	1	1	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Flow around solid bodies and wings. Wing sections, lift and drag. Subsonic potential flows, viscous flows, laminar and turbulent boundary layers; aerodynamics of airfoils and wings, thin airfoil theory, lifting line theory, panel method/interacting boundary layer methods supersonic and hypersonic airfoil theory. Supersonic effects. Linearized compressible flow. Wing-body combinations. Computational methods.										

Engineering Elective (1)

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE205	Mechanics of Fibrous Composite Materials	DPE102	٣	2	1	٣	٦	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (1) (MR)										
Topics	Effective stiffness properties of composites. Constitutive description of laminated plates. Laminated plate theory. Edge effects in laminates. Nonlinear theory of generally laminated plates. Governing equations in the Von Karman sense. Laminated plates with moderately large deflections. Post-buckling and nonlinear vibration of laminated plates. Failure theories and experimental results for laminates.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE206	Mechanics of Composite and Micro structured Media	DPE102	٣	2	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (1) (MR)										
Topics	An introduction to the mechanics of composite (more than one phase) solids with an emphasis on the derivation of macroscopically constitutive laws based on the microstructure. Eshelby transformation theory, self consistent methods, homogenization theory for periodic media, bounding properties for effective modules of composites. Applications of aerospace interest.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE207	Analysis of Plates and Shells	DPE102	٣	2	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (1) (MR)										
Topics	This course explores the following topics: derivation of elastic and plastic stress-strain relations for plate and shell elements; the bending and buckling of rectangular plates; nonlinear geometric effects; post-buckling and ultimate strength of cold formed sections and typical stiffened panels used in naval architecture; the general theory of elastic shells and axisymmetric shells; buckling, crushing and bending strength of cylindrical shells with application to offshore structures; and the application to crashworthiness of vehicles and explosive and impact loading of structures. The class is taught during the first half of term.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE208	Failure Analysis	DPE102	٣	2	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (1) (MR)										
Topics	This course is designed to cover the following subjects: understanding failure formation; damage mechanisms such as fatigue, wear, corrosion, creep and other mechanical failures; procedural approaches in failure analysis; metallographic and fractographic studies. Mechanisms in overload, fatigue, impact and creep failures will be discussed in detail. The primary aim of this course is to provide general knowledge on the procedures and mechanisms involved in failure analysis.										

LEVEL (300) Semester 7

Senior 1 LEVEL 300 COURSES

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 301	Design of Aircraft Propulsion systems	DPE 203	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Topics	Airbreathing propulsion, rocket propulsion and an introduction to modern advanced propulsion concepts. Includes thermodynamic cycles as related to propulsion and the chemistry and thermodynamics of combustion. Students analyze turbojets, turbofans and other air-breathing propulsion systems.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 302	Aero-Spacecraft Structure Design 2	DPE 203	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Modeling of one dimensional element, for determining internal forces and stresses. Modeling of two dimensional elements, for determining internal forces and stresses. Modeling of three dimensional elements, for determining internal forces and stresses. With applications on Structural Mechanics, Fluid Mechanics and Thermal Applications.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE301	Stability and Control	DPE203	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Introduction to the spacecraft dynamics and control of atmospheric flight vehicles - Spacecraft orbit and attitude representations: kinematics, dynamics - Perturbation equations for near circular orbits - Spacecraft maneuvers formulated and solved as control problems - equations for longitudinal and lateral flight dynamics – analysis of discrete control systems by time domain and transform techniques - stability analysis (Routh stability test) – root locus based controller design - synthesis of discrete time controllers.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
INE207	Engineering Economy	None	2	1	2	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Topics	Elementary economy analysis, Linear programming, Rate of return, Replacement and maintenance analysis, Depreciation, Evaluation of public alternatives, Make or by decision, Project management.										

Engineering Elective (2)

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 303	Space Mission Design	DPE 203	3	2	2	1	5	50	-	50	100
								50%	-	50%	100%
Catogary	Engineering Elective (2) (MR)										
Topics	Mission characterization, Requirements definition, Mission geometry, Subsystems requirements, Mission evaluation, Launch system, Mission operation.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 304	Helicopter Dynamics	MPE202	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (2) (MR)										
Topics	Space Dynamics, Dynamics of Rigid Bodies, Two Body Problem, Orbit Determination, Orbit Transfer, Satellite Attitude Dynamics, Attitude Determination in Space, Sensors and Gyroscopes, Attitude Control, Thruster Control, Attitude Stabilization with Spin, Control with Momentum Wheel, Control of Translational Motion.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 305	Helicopter Aerodynamics	MPE202	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (2) (MR)										
Topics	The development of rotating-wing aircraft and the helicopter. Hovering theory and vertical flight performance analysis. Auto-rotation, physical concepts of blade motion and control, aerodynamics and performance of forward flight. Blade stall, stability and vibration problems. Design problems										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 306	Unmanned Air Vehicles	MPE202	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (2) (MR)										
Topics	This course is a survey of unmanned aircraft systems (UAS), emphasizing the military and commercial history, growth, and application of UASs. The course will include basic acquisition, use, and operation of UASs with an emphasis on operations. Proof of US citizenship is required.										

Engineering Elective (3)

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 307	Satellite Technology	DPE 203	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (3) (MR)										
Topics	Spacecraft payload, spacecraft payload design and sizing, Spacecraft subsystems, Spacecraft manufacturing and reliability, Spacecraft testing methodologies, Spacecraft cost modeling,										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 308	Aerodynamics of V/STOL	MPE202	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (3) (MR)										
Topics	Two- and three-dimensional potential flow about wings and bodies; complex-variable methods; singularity distributions; numerical solution using panel methods. Unsteady aerodynamics; slender-body theory. Viscous effects: airfoil stall, high-lift systems, boundary-layer control. Wings and bodies at transonic and supersonic speeds; numerical methods.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 309	Instruments of Helicopters	MPE202	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (3) (MR)										
Topics	This course will examine helicopter instrument flying in the National Airspace System below 18,000 feet. Topics to be covered include Federal Aviation Regulations, helicopter performance for instrument flight, instrument approach procedures, weather related to instrument flying, en route navigation, and the elements of resource management. By the end of the course, the student will have met the aeronautical knowledge requirements to take the FAA Instrument, Rotorcraft-Helicopter written knowledge test.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 310	Internal Combustion Engines	MPE202	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (3) (MR)										
Topics	Reciprocating ICEs: Theoretical Air and Gas Cycles, Fuels for ICE, Admission and Compression, Combustion Process in ICE, Combustion Knock and Knock Rating, Expansion and Exhaust, Power Output, Supercharging. Heat Loss Through Cylinders and Piston, Performance, Emission, Engine systems Design. Gas Turbine Power Units. Special Design Engines.										

Elective (3) Humanities

Senior 1 LEVEL 300 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 303	Scientific Research Methods	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (3) (UR)										
Objective	To learn about Scientific Research Methods										
Topics	Setting up, development and methods of scientific thinking - Scientific Research curricula and tools - Selecting and developing topics - deducing results - Methods of gathering and presenting data - methods of using the library - Report writing.										

Senior 1 LEVEL 300 COURSES											
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 301	Seminar 1	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (3) (UR)										
Objective	To learn about characteristics of good seminar presentation.										
Topics	Talks and presentations are invited from industrial establishments relevant to the program. The guest speaker should discuss the organization, management, and recent technologies implemented in his/her industrial establishment. Students exercise writing brief technical reports on the guest presentation and deliver their own presentation about the topic.										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 304	Introductory Industrial Psychology	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (3) (UR)										
Objective	To learn an Introductory Industrial Psychology										
Topics	Definition of fields and aims of Psychology and its importance in practical life - Bases of human behaviour and motives - conscientiousness, learning. and recall - intelligence and thinking - harmony in personality - Applying principles of Psychology in the fields of Industrial Psychology - realizing convenience between the individual and, his profession - Analyzing work - Selecting the individual - Industrial training and its Psychological bases - Group interaction within the Industrial organizations.										

Senior 1 LEVEL 300 COURSES												
Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
HUM 305	Introductory Industrial Sociology	None	2	2	-	-	2	50	-	50	100
								50%	-	50%	100%
Catogary	University elective (3) (UR)										
Objective	To learn an introduction of Industrial Sociology										
Topics	Concepts of the social structure - levels of the social, cultural and bringing up relations - Processes of organizing the social systems and the social change social cases related to industry and industrialization in the developing countries - the necessary social requirements to face the industrialization challenges - the contemporary theories of the industrial organizations and its suitability with the facts of the developing countries - analyzing the relation 'between industrialization and the social systems - Analyzing the relation between industrialization and the urban development in Egypt.										

LEVEL (300) Semester 8

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 311	Design of Rocket Propulsion systems	MPE 301	2	2	1	-	3	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Topics	Rocket propulsion and an introduction to modern advanced propulsion concepts. Introduces liquid- and solid-propellant rockets and advanced propulsion concepts such as Hall thrusters and pulsed plasma thrusters. Students also learn about the environmental impact of propulsion systems and work in teams to design a jet engine.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 312	Computer Aided Aero-Spacecraft Structural Analysis	DPE 203& DPE204	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Determination of Natural Frequency, Performing Modal Analysis and Determination of Vibration Modes of: one dimensional element, two dimensional elements and three dimensional elements.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
CSE 313	Sensors and Actuators	ECE201	3	2	1	٢	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Terminology and principle of measuring system- Statistical concepts – Assessment of uncertainty - Repeatability and accuracy – sources of error – linear measurement angular measurement – interferometry – surface finish – Gear measurement – thread measurement. Lab: Measurements of: Angles – cylindrical taper rods – taper hole – straightens – surface roughness.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE301	Heat Transfer	MPE101	2	2	1	1	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Introduction and fundamentals of heat transfer methods – Steady one dimensional heat conduction – Unsteady heat conduction – Radiation heat transfer – Two-dimensional conduction eat transfer and applications. Free and forced convection heat transfer. Heat transfer with change of phase. Multi modes heat transfer. Heat exchangers. Convection and diffusion mass transfer and applications. Lab: Determination of heat transfer coefficient of solid material – free convection and radiation heat transfer.										

Engineering Elective (4)

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 314	Theory of Control	DPE301	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (4) (MR)										
Topics	Concepts of linear systems: state equations, transfer functions, stability, time response, frequency response. Fundamentals of feedback control, including root locus and Nyquist analysis applied to flight control. Review of single variable systems and extensions to multivariable systems. Purpose of feedback. Sensitivity, robustness, and design trade-offs. Design formulations using both frequency domain and state space descriptions. Pole placement/observer design. Linear quadratic Gaussian based design methods. Design problems unique to multivariable systems.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 315	High Speed Aerodynamics	MPE 201	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (4) (MR)										
Topics	Contemporary aerodynamic analysis and design of aerospace vehicles and other systems. Topics include: review of theoretical concepts and methods, computer-based CFD tools, experimental methods and wind tunnel testing. Case studies are discussed to illustrate the combined use of advanced aerodynamic design methods. A team project is required.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 316	Basic Navigation Systems	DPE301	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (4) (MR)										
Topics	Introduction to navigation for Aeronautical Science. The course content includes aircraft instruments and systems theory, aircraft performance, navigation theory and solution methods, application of electronic navigation systems, precision flight control principles, navigation information sources and planning procedures, and special problems in navigation with emphasis on flight planning.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 317	Solar Energy	DPE ٢٠3	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (4) (MR)										
Topics	Primary alternative energy system (e.g. wind or solar photovoltaic or solar thermal) and energy storage. Availability and the evaluation of thermodynamic properties, thermodynamics of compressible flow, thermodynamic power systems, mixtures of ideal gasses, wind energy conversion, solar photovoltaic and solar thermal energy systems, solar cells and direct energy conversion. Design and optimization a power system for a stationary or a vehicles/craft.design and optimization of an alternative power system to stationary or vehicle/craft.										

Engineering Elective (5)

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 318	Structure Testing	DPE ٣٠٧	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (5) (MR)										
Topics	Engineering Data - Manufacture of High-Reliability Hardware - Inspection and Quality Assurance - The Qualification Program - Spacecraft Qualification Test Flow - Launch Site Operations.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 319	Aircraft Instruments	DPE301	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (5) (MR)										
Topics	Measuring Instruments: Pressure, Temperature, Airspeed, Altitude. Control Systems and Instruments of Control Surfaces, Fuel Control System, Hydraulic Control System, Electric Power System, Safety Systems: Approach Warning, Wind-Shear Warning.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 320	Boundary Layer Theory	DPE 316	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (5) (MR)										
Topics	Laminar and Turbulent Boundary Layers, Governing Differential and Integral Equations. Exact and Approximate Solutions of Boundary-Layer Equations without and with Pressure Gradients. Boundary Layers with Heat/Mass Transfer. Wakes and Jets. Friction Drag Calculation. Compressible Boundary-Layer Flow. Shock Wave-Boundary Layer Interaction. Boundary Layer Control.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 321	Aircraft Systems and Components	DPE301	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (5) (MR)										
Topics	Navigational Systems, Integrated Navigation System, Approach and Landing Systems,Control Systems, Fuel Control System, Hydraulic Control System, Electric Power System, Safety Systems: Approach Warning, Wind-Shear Warning.										

LEVEL (400) Semester 9

Senior 2 LEVEL 400 COURSES

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 401	Graduation Project (1)	CSE001+ Completed ١٢٠ CH	٢	١	–	٣	٤	50	50	-	100
								50%	50%	-	100%
Catogary	Compulsory (MR)										
Topics	The content of this course is variable and therefore it is repeatable for credit. Students collaborate with faculty research mentors on an ongoing project in a faculty member's laboratory or conduct independent research under the guidance of a faculty member. This experience provides students with an inquiry based learning opportunity and engages them as active learners in a research setting. Arrangements must be made with a specific faculty member before registration.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 402	Flight Mechanics and Control	DPE 212	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	The analysis, characterization and determination of space trajectories from a dynamical systems viewpoint. The general formulation and solution of the spacecraft trajectory design and navigation problems. Computation of periodic orbits and their stability. Estimation of model parameters from spacecraft tracking data (e.g., gravity field estimation). Elements of precision modeling and precision orbit determination.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 403	Modeling and Simulation	DPE301	2	1	2	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Introduction to matrix operations using MATLAB/MAT_SAP - Modeling and analysis of lumped physical systems - static and dynamic response of electrical, mechanical, thermal and hydraulic elements, systems and transducers - Laplace transforms, transfer functions, frequency response - mixed systems - use of state space and matrix methods in systems modeling and analysis.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE40٤	Design of Turbo machines	MPE202	٢	2	1	-	٣	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (FR)										
Topics	Characteristics of Wind Energy Resources. Aerodynamics of Horizontal-Axis Wind Turbines: Blade Element-Momentum Theory, Vortex-Wake Analysis. Aerodynamics of High Speed Vertical-Axis Wind Turbines. Engineering Design of Wind Energy Conversion Systems: Wind Generators, Wind Pumps.										

Engineering Elective (6)

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 40٦	Nonlinear Systems and Control	DPE 314	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (6) (MR)										
Topics	Introduction to the analysis and design of nonlinear systems and nonlinear control systems. Stability analysis using Liapunov, input-output and asymptotic methods. Design of stabilizing controllers using a variety of methods: linearization, absolute stability theory, vibrational control, sliding modes and feedback linearization.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 40٧	Analysis and Optimization of Airplane Performance	DPE 312	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (6) (MR)										
Topics	Review of Aerodynamic Foundations. Basic Flight Theory. Drag Equations. Climbing Performance. Review of Power-Plant Characteristics. Take-off and Landing Performance. Fuel Consumption, Range and Endurance. Turning Performance. Vectored Thrust. Transonic and Supersonic Flight.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 40٨	Aeroelasticity	DPE 316	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (6) (MR)										
Topics	Introduction to aeroelasticity. Vibration and flutter of elastic bodies exposed to fluid flow. Static divergence and flutter of airplane wings. Flutter of flat plates and thin walled cylinders at supersonic speeds. Oscillations of structures due to vortex shedding.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 40٩	Design of Rocket Engine	MPE 311	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (6) (MR)										
Topics	Analysis of liquid and solid propellant rocket power plants; propellant thermo chemistry, heat transfer, system considerations. Low-thrust rockets, multi-stage rockets, trajectories in powered flight, electric propulsion.										

Engineering Elective (7)

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 41٤	Spacecraft Control	DPE 314	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (7) (MR)										
Topics	Formulation and solution of optimization problems for atmospheric flight vehicles and space flight vehicles. Optimality criteria, constraints, vehicle dynamics. Flight and trajectory optimization as problems of nonlinear programming, calculus of variations, and optimal control. Algorithms and software for solution of flight and trajectory optimization problems.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 4١٥	Computational Aerodynamics	DPE 316	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (7) (MR)										
Topics	Computational methods used in Aerospace engineering, including time integration techniques for ordinary differential equations, finite differences, finite volumes, finite elements, and probabilistic methods. Emphasis is placed on analysis and implementation of the underlying numerical methods. Computer programming in Matlab or a similar language is required.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE4١٦	Missile Control Systems	DPE 31٤	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (7) (MR)										
Topics	Transfer Functions for a Ballistic-type Missile, Control of Aerodynamic Missiles, Roll Stabilization, Rigid Missile Control System, Flexibility Effects, Command Guidance, Bank-to-Turn Missile Guidance, Other Control Systems.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 41٧	Flight Test Techniques Laboratory	MPE 319	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (7) (MR)										
Topics	Theory and practice of obtaining flight-test data on performance and stability of airplanes from actual flight tests. Modern electronic flight test instrumentation, collection of flight test data, calibration procedures for air data sensors, estimation of stability derivatives from flight test data. Lectures and laboratory.										

LEVEL (400) Semester 10

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 4١0	Graduation Project (2)	MPE 401	٢	١	–	٣	٤	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Topics	Continuation of project activities started by MPE 401.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 411	Planning and Testing of Space vehicles	DPE 31٤	2	1	1	2	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Mechanical testing: static – vibration – shock and acoustic tests, Environmental Effect testing: Thermal cycle test - heat balance test										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 412	Guidance and Control	DPE301	2	1	1	2	4	50	-	50	100
								50%	-	50%	100%
Catogary	Compulsory (MR)										
Topics	This concentration involves study and research in system theory, control theory, optimal control theory, time-delay observers, estimation theory, and stochastic control theory, and the application of these theories to the navigation, guidance, control, and flight mechanics of aerospace vehicles. Research is primarily analytical and numerical in nature. Excellent computational and experimental facilities are available for the study of various guidance and control applications.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 413	Navigation Systems	DPE301	2	1	1	2	4	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Principles of avionics, navigation and guidance. Deterministic and stochastic linear perturbation theory. Position fixing and celestial navigation with redundant measurements. Recursive navigation and Kalman filtering. Pursuit guidance, proportional navigation, ballistic guidance and velocity-to-be-gained guidance. Hardware mechanization.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE405	Data Analysis and System Identification	DPE307& DPE308	3	2	1	2	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Compulsory (MR)										
Topics	Methods of data analysis and empirical modeling. Sensors and measurement concepts. Time and frequency data analysis; statistical and spectral concepts. Linear regression and identifications of time-series models. Parameter estimation using optimization. Basis-function expansions and non-linear time-series identification. Eigen system realization and subspace identification. Non-linear state space identification.										

Engineering Elective (8)

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 41٨	Thermal Analysis of Spacecrafts	DPE307+ MPE 308	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (8) (MR)										
Topics	Power Sources - Energy Storage - Power Distribution – Power Regulation and Control - Spacecraft Thermal Environment - Thermal Control Components - The Thermal Design and Development Process – Thermal Control Challenges - Heat Balance Estimation, Mass, Power, Telemetry Estimates										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
MPE 41٩	Missile and Projectile Aerodynamics	DPE 316	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (8) (MR)										
Topics	Missile Classifications and Configurations. Calculation of Aerodynamic Characteristics of Missile Components using Slender Body Theory at Subsonic and Supersonic Speeds. Effects of Aerodynamic Interference between Missile Components. Total Drag Determination and Drag Reduction Techniques. Aerodynamic-Heating Problems.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 4٢٠	Spacecraft design and analysis	DPE 31٤	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (8) (MR))										
Topics	Introduction. Mission Definition and Purposes, Preliminarily Estimation for Mission Requirement and Restriction. Mission Description and Evaluation. Requirement Definition. Space Mission Engineering. Mission Operation. Restriction on Mission Design. Space Mission Analysis and Design. Execution of Mission.										

Code	Course Title	Prerequisite	Contact hours					Marks			
			Cr	Lec	Tutorial	Lab	Total	CW	O/P	FE	Total
DPE 4٢١	Space Systems Engineering	MPE 402	3	2	2	1	5	30	20	50	100
								30%	20%	50%	100%
Catogary	Engineering Elective (8) (MR)										
Topics	Introduction to the engineering design process for space systems: Includes a lecture phase that covers mission planning – launch vehicle integration – propulsion, power systems – communications – budgeting – reliability. Subsequently, students experience the latest practices in space-systems engineering by forming intomission-component teams and collectively designing a space mission. Effective team and communication skills are emphasized. Report writing and presentations are required throughout, culminating in the final report and public presentation.										