



وزارة التعليم العالي والبحث العلمي  
جهاز الإشراف والتقويم العلمي  
دائرة ضمان الجودة والاعتماد الأكاديمي  
قسم الاعتماد

# دليل وصف البرنامج الأكاديمي والمقرر الدراسي لقسم هندسة تقنيات الحاسوب

2025

## نموذج وصف البرنامج الأكاديمي

اسم الجامعة:

الكلية/ المعهد: كلية مدينة العلم الجامعة

القسم العلمي: قسم هندسة تقنيات الحاسوب

اسم البرنامج الأكاديمي او المهني: بكالوريوس هندسة تقنيات الحاسوب

اسم الشهادة النهائية: بكالوريوس في هندسة تقنيات الحاسوب

النظام الدراسي: فصلي

تاريخ اعداد الوصف: 2025-7-12

تاريخ ملء الملف: 2025-7-12



التوقيع:

اسم معاون العلمي: أ.د. ثامر كاظم يوسف

التاريخ: 2025-7-12



التوقيع:

اسم رئيس القسم: م.د. معطي ناجي سعيد

التاريخ: 2025-7-12

دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي: خوله سعدون طاهر

التاريخ: 2025-7-12



مصادقة السيد العميد



التوقيع:

### 1. رؤية البرنامج

لإعداد خريجين ذوي كفاءة عالية ودافعية متميزة من خلال منهج دراسي صارم يجمع بين الجانب النظري والتطبيقات التقنية، بما يعزز القدرة على حل المشكلات، وبناء الأنظمة، وتطوير وتنفيذ الحلول الحاسوبية سواءً بشكل فردي أو ضمن فرق عمل.

### 2. رسالة البرنامج

تصميم حلول للمشكلات الهندسية المعقدة، وتصميم مكونات الأنظمة أو العمليات بما يلبي الاحتياجات المحددة، مع مراعاة مناسبة للصحة والسلامة العامة والاعتبارات الثقافية والمجتمعية والبيئية.

### 3. أهداف البرنامج

تقنيات هندسة الحاسوب هي مجال يختص بتطبيق المبادئ الهندسية والتكنولوجية في تصميم وتطوير وصيانة أجهزة الحاسوب وبرمجياته وأنظمة الشبكات. ولتحقيق النجاح في هذا المجال، يحتاج المتخصصون إلى امتلاك مجموعة من الكفاءات المحددة. وفيما يلي أبرز الكفاءات الأساسية لقسم تقنيات هندسة الحاسوب:

1. مهارات البرمجة: إتقان لغات البرمجة أمر أساسي لمهندسي تقنيات الحاسوب، مثل لغات ++C و MATLAB و Python. يجب أن يكونوا قادرين على تطوير البرامج واختبارها وصيانتها بما يلبي احتياجات المستخدمين.
2. المهارات الرياضية: ينبغي أن يكونوا متمكنين من مفاهيم رياضية مثل الجبر، وحساب المثلثات، والتفاضل والتكامل، نظرًا لدورها الحيوي في تصميم وتطوير واختبار مكونات وأنظمة الحاسوب.
3. المعرفة بأجهزة الحاسوب: يجب أن يمتلك المتخصصون معرفة متينة بمكونات أجهزة الحاسوب، بما في ذلك المعالجات والذاكرة والتخزين والمكونات الأساسية الأخرى، ويتم تغطية ذلك في مواد مثل تنظيم الحاسوب والمعالجات الدقيقة وهندسة الحاسوب المتقدمة.
4. مهارات الشبكات: ينبغي أن يكونوا قادرين على تصميم الشبكات الحاسوبية وتكوينها واستكشاف الأخطاء وإصلاحها وصيانتها، إضافةً إلى التعامل مع بروتوكولات التشغيل وأمن الشبكات والإنترنت بشكل عام.
5. مهارات أنظمة الاتصالات: الإلمام بأنواع مختلفة من أنظمة الاتصالات، سواءً التناظرية أو الرقمية أو المتنقلة، يمنح مهندس تقنيات الحاسوب قاعدة صلبة لعمله المستقبلي.
6. مهارات التصميم واستكشاف الأعطال: يجب أن يمتلك المتخصصون القدرة على تصميم الأنظمة وتنفيذها، وكذلك التعرف على أعطال الأنظمة وتشخيصها قبل تطبيق الإجراءات التصحيحية، ويشمل ذلك مواد مثل أجهزة القياس والتحكم، الأنظمة الزمنية الحقيقية، المتحكمات الدقيقة، وغيرها.

7. مهارات حل المشكلات: يتوقع من المتخصصين امتلاك مهارات قوية في حل المشكلات، حيث تقع على عاتقهم مسؤولية تحديد المشكلات المعقدة وتقييمها وتصميم حلول فعالة، ويغطي ذلك بشكل كبير مواد مثل إدارة المشاريع ونظرية المعلومات إلى جانب التحليل الهندسي.
8. مهارات الكهرباء والإلكترونيات: يعد الإلمام بأساسيات الدوائر والأنظمة الكهربائية والإلكترونية وتصميمها وتنفيذها أمراً بالغ الأهمية.
9. مهارات إدارة قواعد البيانات: المعرفة ببنية قواعد البيانات واستعلاماتها وإدارتها ضرورية لضمان الأداء الأمثل لتطبيقات البرمجيات.
10. مهارات البحث والتطوير: يجب أن يواكب المتخصصون الاتجاهات التكنولوجية الحديثة وأن يظلوا مطلعين على التقنيات الناشئة وأفضل الممارسات في الصناعة.

تشمل كفاءات متخصص تقنيات هندسة الحاسوب: تكوين الأجهزة والبرمجيات، مهارات البرمجة، معرفة بالشبكات والأمن، استكشاف الأعطال وإصلاحها، إدارة قواعد البيانات، التعاون، الاتصال، إدارة الوقت، تصميم الحلول المخصصة، والبحث والتطوير. وبشكل عام، فإن امتلاك هذه الكفاءات يزود المتخصصين بالمهارات اللازمة لتصميم وتنفيذ وصيانة أنظمة وشبكات الحاسوب بكفاءة وفعالية.

#### 4. الاعتماد البرامجي

لا يوجد.

#### 5. المؤثرات الخارجية الأخرى

لا يوجد جهة راعية للبرنامج.

#### 6. هيكلية البرنامج

| هيكل البرنامج   | عدد المقررات | وحدة دراسية | النسبة المئوية | ملاحظات * |
|-----------------|--------------|-------------|----------------|-----------|
| مقررات إلزامية  | 47           | 220         | 92%            |           |
| مقررات اختيارية | 4            | 20          | 8%             |           |
| مقررات اجمالية  | 51           | 240         | 100%           |           |
| التدريب الصيفي  | 2            | 4           | استيفاء        |           |
| أخرى            | -            | -           | -              |           |

\* ممكن ان تتضمن الملاحظات فيما اذا كان المقرر أساسي او اختياري.

## 7. وصف البرنامج

| الساعات المعتمدة |      | اسم المقرر أو المساق        | رمز المقرر أو المساق | السنة (المستوى) / الفصل |
|------------------|------|-----------------------------|----------------------|-------------------------|
| نظري             | عملي |                             |                      |                         |
| 2                |      | مبادئ الرقمية               | CET1101              | الأولى / الأول          |
| 2                |      | مبادئ الهندسية الكهربائية   | CET1102              | الأولى / الأول          |
| 3                |      | الرياضيات I                 | CET1103              | الأولى / الأول          |
| 3                |      | الرسم الهندسي               | CET1104              | الأولى / الأول          |
| 4                |      | الورش الهندسية              | CET1105              | الأولى / الأول          |
| 1                |      | اللغة الإنكليزية 1          | MTU1002              | الأولى / الأول          |
| 2                | 2    | الانظمة الرقمية             | CET1201              | الأولى / الثاني         |
| 2                | 2    | الدوائر الكهربائية          | CET1202              | الأولى / الثاني         |
| 2                | 2    | أساسيات البرمجة             | CET1203              | الأولى / الثاني         |
| 3                |      | الرياضيات II                | CET1204              | الأولى / الثاني         |
| 2                |      | الديمقراطية وحقوق الانسان   | MTU1006              | الأولى / الثاني         |
| 2                |      | اللغة العربية               | MTU1001              | الأولى / الثاني         |
| 1                |      | اساسيات الحاسوب             | MTU1004              | الأولى / الثاني         |
| 3                |      | الرياضيات الهندسية          | CET2101              | الثانية / الأول         |
| 2                | 2    | البرمجة الكيانية            | CET2102              | الثانية / الأول         |
| 2                | 2    | تركيب الحاسوب وتطبيقاته     | CET2103              | الثانية / الأول         |
| 2                | 2    | مبادئ الالكترونيك           | CET2104              | الثانية / الأول         |
| 2                | 2    | اسس الاتصالات               | CET2105              | الثانية / الأول         |
| 1                |      | اللغة الإنكليزية 2          | MTU1003              | الثانية / الأول         |
| 2                |      | جرائم نظام البحث            | MTU1007              | الثانية / الأول         |
| 3                |      | الرياضيات الهندسية المتقدمة | CET2201              | الثانية / الثاني        |
| 2                | 2    | البرمجة بلغة بايثون         | CET2202              | الثانية / الثاني        |
| 2                | 2    | المعالجات الدقيقة           | CET2203              | الثانية / الثاني        |
| 2                | 2    | الاتصالات التماثلية         | CET2204              | الثانية / الثاني        |
| 2                | 2    | الدوائر الالكترونية         | CET2205              | الثانية / الثاني        |
| 2                | 2    | الاجهزة والقياس             | CET2206              | الثانية / الثاني        |
| 2                |      | اللغة العربية 2             | MTU1009              | الثانية / الثاني        |
| 2                | 2    | انظمة التشغيل               | CET3101              | الثالثة / الأول         |
| 2                | 2    | اسس هندسة السيطرة           | CET3102              | الثالثة / الأول         |
| 2                | 2    | معالجة الاشارة الرقمية      | CET3103              | الثالثة / الأول         |
| 2                | 2    | المسيطرات الدقيقة           | CET3104              | الثالثة / الأول         |

|   |   |                                |         |                 |
|---|---|--------------------------------|---------|-----------------|
| 2 | 2 | الاتصالات الرقمية              | CET3105 | الثالثة/ الأول  |
| 2 | 2 | مادة اختيارية                  | CET31XX | الثالثة/ الأول  |
| 2 | 2 | انظمة السيطرة المتقدمة         | CET3201 | الثالثة/ الثاني |
| 2 | 2 | اساسيات شبكات الحاسوب          | CET3202 | الثالثة/ الثاني |
| 2 | 2 | قواعد البيانات                 | CET3203 | الثالثة/ الثاني |
| 2 | 2 | التحليلات الهندسية             | CET3204 | الثالثة/ الثاني |
| 2 | 2 | اتصالات البيانات               | CET3205 | الثالثة/ الثاني |
| 2 | 2 | مادة اختيارية                  | CET32XX | الثالثة/ الثاني |
| 2 | 2 | نظرية المعلومات والترميز       | CET4101 | الرابعة/ الأول  |
| 2 | 2 | بروتوكولات شبكات الحاسوب       | CET4102 | الرابعة/ الأول  |
| 2 | 2 | الاتصالات المتنقلة             | CET4103 | الرابعة/ الأول  |
| 2 | 2 | الادارة الهندسية               | CET4104 | الرابعة/ الأول  |
|   | 2 | اخلاقيات المهنة                | MTU1008 | الرابعة/ الأول  |
| 2 | 2 | مادة اختيارية                  | CET41XX | الرابعة/ الأول  |
| 2 | 2 | اتصالات الالياف البصرية        | CET4201 | الرابعة/ الثاني |
| 2 | 2 | تكنولوجيا الحاسوب المتقدم      | CET4202 | الرابعة/ الثاني |
| 2 | 2 | أمنية الشبكات والامن السيبراني | CET4203 | الرابعة/ الثاني |
| 2 | 2 | الحوسبة السحابية               | CET4204 | الرابعة/ الثاني |
| 2 |   | مشروع                          | CET4205 | الرابعة/ الثاني |
| 2 | 2 | مادة اختيارية                  | CET42XX | الرابعة/ الثاني |

| 8. مخرجات التعلم المتوقعة للبرنامج                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| المعرفة: يتطلب قسم تقنيات هندسة الحاسوب من المتخصصين امتلاك كفاءات عامة إلى جانب المهارات والمعارف التقنية اللازمة لأداء مهامهم بكفاءة. وفيما يلي بعض الكفاءات العامة المطلوبة من قبل قسم تقنيات هندسة الحاسوب: |
| مخرجات التعلم 1:                                                                                                                                                                                                |
| 1. التفكير التحليلي: القدرة على تحديد المشكلات المعقدة وتحليلها وتقديم حلول عملية يُعد أمرًا جوهريًا للمتخصصين في هذا المجال.                                                                                   |
| 2. التعلم المستمر: مواكبة التقنيات والأدوات والأساليب الحديثة أمر ضروري ليظل المتخصصون قادرين على المنافسة.                                                                                                     |
| المهارات:                                                                                                                                                                                                       |
| مخرجات التعلم 2                                                                                                                                                                                                 |
| 1. قابلية التكيف: القدرة على التكيف والتعامل مع التغييرات أمر أساسي في ظل المشهد التكنولوجي المتغير باستمرار.                                                                                                   |
| 2. الإبداع: القدرة على التفكير الإبداعي والابتكار تساهم في تطوير حلول ومنتجات جديدة.                                                                                                                            |
| 3. العمل الجماعي: يجب أن يتمكن المتخصصون من العمل التعاوني مع الزملاء والعملاء وأصحاب المصلحة لتحقيق النتائج المرجوة.                                                                                           |

4. مهارات الاتصال: تمثل مهارات الاتصال الفعال عنصراً أساسياً لفهم القضايا التقنية وشرحها للزملاء والعملاء وأصحاب المصلحة بوضوح واختصار.

القيم:

1. إدارة المشاريع: الكفاءة في إدارة المشاريع ضرورية، وتشمل التخطيط والتنظيم وتخصيص الموارد.
2. إدارة الوقت: القدرة على إدارة الوقت أمر بالغ الأهمية لضمان إنجاز مراحل المشروع في مواعيدها.
3. القيادة: ينبغي للمتخصصين أن يمتلكوا القدرة على تحفيز وقيادة الفرق لتحقيق أهداف المشروع.
4. تصميم الحلول المخصصة: القدرة على تصميم وتطوير وصيانة تطبيقات برمجية وحلول مخصصة تلبي متطلبات المستخدمين النهائيين واحتياجاتهم العملية.

## 9. استراتيجيات التعليم والتعلم

- التعليم التعاوني
- الرؤوس المرقمة
- الفصل المقلوب
- الأنشطة المتدرجة

## 10. طرائق التقييم

اجراء الامتحانات الدورية والمفاجئة وحسب خطة القسم

مراجعة الموضوعات السابقة عن طريق المناقشات داخل الصف وذلك قبل تناول الموضوعات الجديدة.

## 11. الهيئة التدريسية

### أعضاء هيئة التدريس

| الرتبة العلمية        |  | التخصص                    |                          | المتطلبات/المهارات الخاصة (ان وجدت) |  | اعداد الهيئة التدريسية |       |
|-----------------------|--|---------------------------|--------------------------|-------------------------------------|--|------------------------|-------|
|                       |  | عام                       | خاص                      |                                     |  | ملاك                   | محاضر |
| أ.م.د. عامر توفيق عبد |  | هندسة إلكترونية واتصالات  | هندسة إلكترونية واتصالات |                                     |  | نعم                    |       |
| م.د. معطي ناجي سعيد   |  | هندسة إلكترونية واتصالات  | هندسة إلكترونية واتصالات |                                     |  | نعم                    |       |
| م.سعد طه ياسين        |  | هندسة كهربائية وإلكترونية | هندسة أنظمة القدرة       |                                     |  | نعم                    |       |

|                              |                              |                              |  |     |  |
|------------------------------|------------------------------|------------------------------|--|-----|--|
| م.م. ريام مثنى صبري          | هندسة كهربائية<br>والكترونية | هندسة كهربائية<br>والكترونية |  | نعم |  |
| م.م. مصطفى فالح صحن          | علوم حاسبات                  | علوم حاسبات                  |  | نعم |  |
| م.د. أسعد حميد سهر           | هندسة إلكترونية<br>واتصالات  | هندسة إلكترونية<br>واتصالات  |  | نعم |  |
| م.د. عامر قيس الجميلي        | هندسة إلكترونية<br>واتصالات  | هندسة إلكترونية<br>واتصالات  |  | نعم |  |
| م.د. خضير جاسم كاظم          | علوم حاسبات                  | علوم حاسبات                  |  | نعم |  |
| م.د. صباح عبد الرزاق العكيلي | علوم حاسبات                  | علوم نكاه<br>اصطناعي         |  | نعم |  |
| م.د. أوس حماد كردي           | هندسة حاسبات                 | هندسة حاسبات                 |  | نعم |  |

| التطوير المهني                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| توجيه أعضاء هيئة التدريس الجدد                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| يتم ذلك من خلال خطط استراتيجية مراجعة وخاصة من اجل السيطرة على اليات التعليم والتعلم واستراتيجيات طرائق التدريس وفق التعليم المدمج.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| التطوير المهني لأعضاء هيئة التدريس                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| خطة وترتيبات التطوير الأكاديمي والمهني لأعضاء هيئة التدريس كاستراتيجيات التدريس والتعلم من خلال اشراكهم في دورات تطوير الموارد البشرية والمتضمنة خمسة دورات تشرف عليها دائرة الدراسات والتخطيط والمتابعة متضمنة - دورة المهارات الادارية- دورة المهارات الذاتية - دورة مهارات الحوكمة الالكترونية -دورة المهارات القانونية-دورة المهارات المالية -وكذلك دورات طرائق التدريس الحديثة التي اقترتها وزارتنا الكريمة منتهجة من التعليم الحديث التفاعلي والمدمج منهجا لجامعتنا العزيزة ..اما بالنسبة لتقييم نتائج التعلم فيتم ذلك من خلال المقابلات المستمرة ونتائج الاستبانات التي يتم توزيعها على الطلبة وكذلك اجراء مسح ميدانية لمخرجات التدريسيين ونتائجهم ، اما بالنسبة للتطوير المهني وما الى ذلك فيتم تقييمه من خلال استمارات تقييم الاداء ومن خلال معدل الترقيات المقدمة ضمن مدتها الصغرى ومديات نجاحها. |

| 12. معيار القبول                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| وضع الأنظمة المتعلقة بالالتحاق بالكلية او المعهد المعيار المتبع هو معدل الطالب لكن يفضل ان يؤخذ بنظر الاعتبار رغبة الطالب في الاختيار واستحالة ذلك في اختيار الكلية لكن على الأقل يؤخذ ذلك عند اختيار بين الأقسام لأن الأمر مهم جدا يعتمد عليه مستقبل الطالب. |

### 13. أهم مصادر المعلومات عن البرنامج

1-الكتب المنهجية

2-الكتب المؤلفة من قبل تدريسيي القسم

3- البحوث والدوريات المحلية والأجنبية

### 14. خطة تطوير البرنامج

-تحديث المناهج على ان يكون وفق ضوابط البيئة المعرفية.

- قراءة وتحليل المصادر العلمية الخارجية والكتب المؤلفة.

- كتابة التقرير والبحوث حول المقرر الدراسية في نهاية كل مادة دراسية.

| مخطط مهارات البرنامج               |    |    |    |          |    |    |    |         |  |    |    |                  |                           |            |                 |
|------------------------------------|----|----|----|----------|----|----|----|---------|--|----|----|------------------|---------------------------|------------|-----------------|
| مخرجات التعلم المطلوبة من البرنامج |    |    |    |          |    |    |    |         |  |    |    | اساسي أم اختياري | اسم المقرر                | رمز المقرر | السنة / المستوى |
| القيم                              |    |    |    | المهارات |    |    |    | المعرفة |  |    |    |                  |                           |            |                 |
| ج4                                 | ج3 | ج2 | ج1 | ب4       | ب3 | ب2 | ب1 |         |  | أ2 | أ1 |                  |                           |            |                 |
| √                                  | √  | √  | √  | √        | √  | √  | √  |         |  | √  | √  | أساسي            | مبادئ الرقمية             | CET1101    | الأولى/ الأول   |
| √                                  | √  | √  | √  | √        | √  | √  | √  |         |  | √  | √  | أساسي            | مبادئ الهندسية الكهربائية | CET1102    | الأولى/ الأول   |
| √                                  | √  | √  | √  | √        | √  | √  | √  |         |  | √  | √  | أساسي            | الرياضيات I               | CET1103    | الأولى/ الأول   |
| √                                  | √  | √  | √  | √        | √  | √  | √  |         |  | √  | √  | أساسي            | الرسم الهندسي             | CET1104    | الأولى/ الأول   |
| √                                  | √  | √  | √  | √        | √  | √  | √  |         |  | √  | √  | أساسي            | الورش الهندسية            | CET1105    | الأولى/ الأول   |
|                                    |    |    |    |          |    |    |    |         |  |    |    | أساسي            | اللغة الإنكليزية 1        | MTU1002    | الأولى/ الأول   |
| √                                  | √  | √  | √  | √        | √  | √  | √  |         |  | √  | √  | أساسي            | الانظمة الرقمية           | CET1201    | الأولى/ الثاني  |
| √                                  | √  | √  | √  | √        | √  | √  | √  |         |  | √  | √  | أساسي            | الدوائر الكهربائية        | CET1202    | الأولى/ الثاني  |
| √                                  | √  | √  | √  | √        | √  | √  | √  |         |  | √  | √  | أساسي            | أساسيات البرمجة           | CET1203    | الأولى/ الثاني  |

|   |   |   |   |   |   |   |   |  |  |   |   |       |                           |         |                |
|---|---|---|---|---|---|---|---|--|--|---|---|-------|---------------------------|---------|----------------|
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  |  | ✓ | ✓ | أساسي | الرياضيات II              | CET1204 | الأولى/ الثاني |
|   |   |   |   |   |   |   |   |  |  |   |   | أساسي | الديمقراطية وحقوق الانسان | MTU1006 | الأولى/ الثاني |
|   |   |   |   |   |   |   |   |  |  |   |   | أساسي | اللغة العربية             | MTU1001 | الأولى/ الثاني |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  |  | ✓ | ✓ | أساسي | اساسيات الحاسوب           | MTU1004 | الأولى/ الثاني |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  |  | ✓ | ✓ | أساسي | الرياضيات الهندسية        | CET2101 | الثانية/ الأول |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  |  | ✓ | ✓ | أساسي | البرمجة الكيانية          | CET2102 | الثانية/ الأول |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  |  | ✓ | ✓ | أساسي | تركيب الحاسوب وتطبيقاته   | CET2103 | الثانية/ الأول |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  |  | ✓ | ✓ | أساسي | مبادئ الالكترونيك         | CET2104 | الثانية/ الأول |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  |  | ✓ | ✓ | أساسي | اسس الاتصالات             | CET2105 | الثانية/ الأول |

|   |   |   |   |   |   |   |   |  |  |   |   |       |                                |         |                 |
|---|---|---|---|---|---|---|---|--|--|---|---|-------|--------------------------------|---------|-----------------|
|   |   |   |   |   |   |   |   |  |  |   |   | أساسي | اللغة الإنكليزية 2             | MTU1003 | الثانية/ الأول  |
|   |   |   |   |   |   |   |   |  |  |   |   | أساسي | جرائم نظام البعث               | MTU1007 | الثانية/ الأول  |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي | الرياضيات<br>الهندسية المتقدمة | CET2201 | الثانية/ الثاني |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي | البرمجة بلغة بايثون            | CET2202 | الثانية/ الثاني |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي | المعالجات الدقيقة              | CET2203 | الثانية/ الثاني |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي | الاتصالات<br>التمثيلية         | CET2204 | الثانية/ الثاني |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي | الدوائر الالكترونية            | CET2205 | الثانية/ الثاني |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي | الاجهزة والقياس                | CET2206 | الثانية/ الثاني |
|   |   |   |   |   |   |   |   |  |  |   |   | أساسي | اللغة العربية 2                | MTU1009 | الثانية/ الثاني |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي | انظمة التشغيل                  | CET3101 | الثالثة/ الأول  |

|   |   |   |   |   |   |   |   |  |  |   |   |         |                           |         |                 |
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| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | اسس هندسة<br>السيطرة      | CET3102 | الثالثة/ الأول  |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | معالجة الاشارة<br>الرقمية | CET3103 | الثالثة/ الأول  |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | المسيطرات الدقيقة         | CET3104 | الثالثة/ الأول  |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | الاتصالات الرقمية         | CET3105 | الثالثة/ الأول  |
|   |   |   |   |   |   |   |   |  |  |   |   | اختياري | مادة اختيارية             | CET31XX | الثالثة/ الأول  |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | انظمة السيطرة<br>المتقدمة | CET3201 | الثالثة/ الثاني |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | اساسيات شبكات<br>الحاسوب  | CET3202 | الثالثة/ الثاني |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | قواعد البيانات            | CET3203 | الثالثة/ الثاني |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | التحليلات<br>الهندسية     | CET3204 | الثالثة/ الثاني |

|   |   |   |   |   |   |   |   |  |  |   |   |         |                           |         |                 |
|---|---|---|---|---|---|---|---|--|--|---|---|---------|---------------------------|---------|-----------------|
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | اتصالات البيانات          | CET3205 | الثالثة/ الثاني |
|   |   |   |   |   |   |   |   |  |  |   |   | اختياري | مادة اختيارية             | CET32XX | الثالثة/ الثاني |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | نظرية المعلومات والتزميز  | CET4101 | الرابعة/ الأول  |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | بروتوكولات شبكات الحاسوب  | CET4102 | الرابعة/ الأول  |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | الاتصالات المتنقلة        | CET4103 | الرابعة/ الأول  |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | الادارة الهندسية          | CET4104 | الرابعة/ الأول  |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | اخلاقيات المهنة           | MTU1008 | الرابعة/ الأول  |
|   |   |   |   |   |   |   |   |  |  |   |   | اختياري | مادة اختيارية             | CET41XX | الرابعة/ الأول  |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | اتصالات الالياف البصرية   | CET4201 | الرابعة/ الثاني |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | تكنولوجيا الحاسوب المتقدم | CET4202 | الرابعة/ الثاني |

|   |   |   |   |   |   |   |   |  |  |   |   |         |                                   |         |                 |
|---|---|---|---|---|---|---|---|--|--|---|---|---------|-----------------------------------|---------|-----------------|
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | أمنية الشبكات<br>والامن السيبراني | CET4203 | الرابعة/ الثاني |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | الحوسبة السحابية                  | CET4204 | الرابعة/ الثاني |
| √ | √ | √ | √ | √ | √ | √ | √ |  |  | √ | √ | أساسي   | مشروع                             | CET4205 | الرابعة/ الثاني |
|   |   |   |   |   |   |   |   |  |  |   |   | اختياري | مادة اختيارية                     | CET42XX | الرابعة/ الثاني |

● يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم

# المقرر الدراسي للمراحل الأربع لقسم هندسة تقنيات الحاسوب

## المقرر الدراسي

**Module 1**

| Code                                                                                                                                                                                                                                                                                                                                                                                                          | Course/Module Title   | ECTS          | Semester    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET1101                                                                                                                                                                                                                                                                                                                                                                                                       | Digital Fundamentals  | 6             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                  | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                             | 2                     | 64            | 86          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                   |                       |               |             |
| <p>This course learns students the basics of digital electronics, it learns the numbering system, kinds of gates and how to use each kind in designing circuits, methods for minimizing the expressions for digital circuits to get the simplest design (Boolean, DE-Morgan, and Karnaugh map), the binary arithmetic operation and combinational logic circuit which used to design the digital systems.</p> |                       |               |             |

**Module 2**

| Code                                                                                                                                                                                                                                           | Course/Module Title                 | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|---------------|-------------|
| CET1102                                                                                                                                                                                                                                        | Electrical Engineering Fundamentals | 6             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                   | Lect/Lab./Prac./Tutor               | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                              | 2                                   | 64            | 86          |
| Description                                                                                                                                                                                                                                    |                                     |               |             |
| <p>This Course Specification prepares the student to be able to realize basic parameters in electrical engineering and how to link these parameters. It also makes him capable of solving electrical circuits using different DC theorems.</p> |                                     |               |             |

**Module 3**

| Code                                                                                                                                                                                                                                                                                                              | Course/Module Title   | ECTS          | Semester    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET1103                                                                                                                                                                                                                                                                                                           | Mathematics-I         | 5             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                      | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                 | 1                     | 48            | 77          |
| Description                                                                                                                                                                                                                                                                                                       |                       |               |             |
| <p>This course is oriented towards providing the 1st year students with the required mathematical preliminaries needed to achieve a full grasp of the knowledge included in the engineering and technical application of their specialization. Furthermore, it is a prerequisite to the course Mathematics II</p> |                       |               |             |

**Module 4**

| Code         | Course/Module Title   | ECTS          | Semester    |
|--------------|-----------------------|---------------|-------------|
| CET1104      | Engineering Drawing   | 5             | 1           |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
|              |                       |               |             |

|                                                                                                                                                           |   |    |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|----|
| -                                                                                                                                                         | 3 | 48 | 77 |
| <b>Description</b>                                                                                                                                        |   |    |    |
| The objective of the course is to provide students with knowledge of engineering disciplines about drawing concepts using the computer program (AUTOCAD). |   |    |    |

#### Module 5

| Code                                                                                                                                                                                                                                                                                                             | Course/Module Title   | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET1105                                                                                                                                                                                                                                                                                                          | Workshops             | 6             | 1           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                     | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| -                                                                                                                                                                                                                                                                                                                | 4                     | 64            | 86          |
| <b>Description</b>                                                                                                                                                                                                                                                                                               |                       |               |             |
| In this course the students are going to learn the basics of electrical establishments and using different measuring devices, how to use irons, types of soldering, how to use absorbent soldering irons, Electronic components such as resistors, capacitors, inductance, transformers, transistor, and diodes. |                       |               |             |

#### Module 6

| Code                                                                                                                                                                   | Course/Module Title   | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| MTU1002                                                                                                                                                                | English Language I    | 3             | 1           |
| Class (hr/w)                                                                                                                                                           | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 1                                                                                                                                                                      | 1                     | 33            | 17          |
| <b>Description</b>                                                                                                                                                     |                       |               |             |
| This course builds solid grammar and works on the vocabulary development of the student. It aims to prepare the student to be more expressive in the English language. |                       |               |             |

#### Module 7

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Course/Module Title   | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET1201                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Digital Systems       | 6             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2                     | 64            | 86          |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                       |               |             |
| In this course, the student will learn how to design digital systems by studying the kinds of temporary storage (flip-flops), and how to use them in designing the different types of counters (asynchronous and synchronous counter beside the design of shift registers which is important in applications of storage and transfer data in digital systems, it also aims to study the convertors that used to translate the signals from analogue to digital form or |                       |               |             |

from digital to analogue form so the students acquire the skill to design different kinds of digital systems.

#### Module 8

| Code                                                                                                                                                                                                                                                                                                                                                                                                        | Course/Module Title   | ECTS          | Semester    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET1202                                                                                                                                                                                                                                                                                                                                                                                                     | Electrical Circuits   | 6             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                           | 2                     | 64            | 86          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                 |                       |               |             |
| <p>This Course Specification prepares the student to be able to realize basic parameters in electrical engineering and how to link these parameters. It also makes him capable of solving electrical circuits using different AC theorems. Moreover, it goes into configuring 3-phase circuits, vectors, phase, and total powers and having the student be capable of linking electricity to magnetism.</p> |                       |               |             |

#### Module 9

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Course/Module Title    | ECTS          | Semester    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| CET1203                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Programming Essentials | 6             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Lect/Lab./Prac./Tutor  | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2                      | 64            | 86          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |               |             |
| <p>Programming skills open you up to careers in almost any industry and are required if you want to continue to more advanced and higher-paying software development and engineering roles.</p> <p>This course is a great place to start learning programming, no prior programming knowledge is required. You'll learn these core skills:</p> <ul style="list-style-type: none"> <li>- Think logically – how to analyze a problem and translate it for a computer to process.</li> <li>- Design, develop, and model real-life problems in your programs.</li> <li>- Understand a programmer's work in the software development process.</li> </ul> |                        |               |             |

#### Module 10

| Code                                                                                                                                                                                                                                                                                                                        | Course/Module Title   | ECTS          | Semester    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET1204                                                                                                                                                                                                                                                                                                                     | Mathematics-II        | 5             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                           | 1                     | 48            | 77          |
| Description                                                                                                                                                                                                                                                                                                                 |                       |               |             |
| <p>This course is oriented towards providing the 1st year students with the required mathematical preliminaries needed to achieve a full grasp of the knowledge included in the engineering and technical application of their specialization. Furthermore, it is a prerequisite to the course Engineering Mathematics.</p> |                       |               |             |

**Module 11**

| Code                                                                                                                                                                                                                                                                              | Course/Module Title        | ECTS          | Semester    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------|-------------|
| MTU1006                                                                                                                                                                                                                                                                           | Democracy and Human Rights | 2             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                      | Lect/Lab./Prac./Tutor      | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                 |                            | 33            | 17          |
| Description                                                                                                                                                                                                                                                                       |                            |               |             |
| The lesson aims to teach the student and familiarize him with topics related to human rights, public freedoms, and democracy, history, types and practices, as well as international conventions and national constitutions related to them, and election mechanisms and methods. |                            |               |             |

**Module 12**

| Code                                                                                                                                                                                                                                                                                                                                          | Course/Module Title   | ECTS          | Semester    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| MTU1001                                                                                                                                                                                                                                                                                                                                       | Arabic Language       | 2             | 2           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                  | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                             |                       | 33            | 17          |
| Description                                                                                                                                                                                                                                                                                                                                   |                       |               |             |
| This course aims to teach the students the proper use of the Arabic language in their formal communication, especially written as they become members of a working body whether in the private or public sector. Clear and concise communicable language is a must in any work environment and this course delivers on the clarity component. |                       |               |             |

**Module 13**

| Code                                                                                                                                                                                                                                     | Course/Module Title   | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| MTU1004                                                                                                                                                                                                                                  | Computer fundamentals | 3             | 2           |
| Class (hr/w)                                                                                                                                                                                                                             | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 1                                                                                                                                                                                                                                        | 1                     | 34            | 41          |
| Description                                                                                                                                                                                                                              |                       |               |             |
| In this course, the student learns and understand computer system work and computer organization and architecture for computer and learn hardware and software computer system with understand computer network and the web technologies |                       |               |             |

**Module 14**

| Code         | Course/Module Title     | ECTS          | Semester    |
|--------------|-------------------------|---------------|-------------|
| CET2101      | Engineering Mathematics | 5             | 3           |
| Class (hr/w) | Lect/Lab./Prac./Tutor   | SSWL (hr/sem) | USWL (hr/w) |
|              |                         |               |             |

|                                                                                                                                                                                                                                                                                                     |   |    |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|----|
| 2                                                                                                                                                                                                                                                                                                   | 1 | 48 | 77 |
| <b>Description</b>                                                                                                                                                                                                                                                                                  |   |    |    |
| The course is oriented towards providing the 2nd year students with the necessary background material to perform mathematical analysis embedded in the engineering and technical application of their specialization. Furthermore, it is a prerequisite to the course advanced applied mathematics. |   |    |    |

#### Module 15

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Course/Module Title         | ECTS          | Semester    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------|-------------|
| CET2102                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Object Oriented Programming | 6             | 3           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Lect/Lab./Prac./Tutor       | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2                           | 79            | 71          |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                             |               |             |
| Design and implement classes and objects to represent real-world entities. Create and manipulate objects through inheritance, polymorphism, and encapsulation. Analyze and solve problems using object-oriented design principles and patterns. Utilize C++ libraries and frameworks to develop robust and scalable applications. Implement data abstraction and encapsulation for secure and efficient code. Plan and execute testing strategies to ensure the functionality and reliability of programs. Collaborate with peers to develop object-oriented solutions to complex programming challenges. Apply exception-handling techniques to handle errors and enhance program robustness. Utilize debugging tools to identify and fix program errors. Evaluate and optimize program performance through code analysis and profiling. |                             |               |             |

#### Module 16

| Code                                                                                                                                                                                                                                                                                                                      | Course/Module Title                    | ECTS          | Semester    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|---------------|-------------|
| CET2103                                                                                                                                                                                                                                                                                                                   | Computer Organization and Applications | 5             | 3           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                              | Lect/Lab./Prac./Tutor                  | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                         | 2                                      | 64            | 61          |
| <b>Description</b>                                                                                                                                                                                                                                                                                                        |                                        |               |             |
| In this course, the student learns the basic concepts in the field of computers system. The students study a comprehensive function description, organization, and the design of the various sections for any computer system in general. Also, make the students able to encode simple programs using assembly language. |                                        |               |             |

#### Module 17

| Code         | Course/Module Title      | ECTS          | Semester    |
|--------------|--------------------------|---------------|-------------|
| CET2104      | Electronics Fundamentals | 5             | 3           |
| Class (hr/w) | Lect/Lab./Prac./Tutor    | SSWL (hr/sem) | USWL (hr/w) |
| 2            | 2                        | 64            | 61          |

**Description**

This course provides students with an understanding of types of materials according to their conductivity, and particularly the semiconductor materials, their physics, energy levels, internal structure, classification, Aspects of electrical conductivity. The course goes through the fundamental concepts of semiconductor diodes, Zener region. In addition to covering the diode applications of rectifiers, clippers, and clampers. It also goes into the BJT transistor and its modeling and analysis.

**Module 18**

| Code         | Course/Module Title        | ECTS          | Semester    |
|--------------|----------------------------|---------------|-------------|
| CET2105      | Communication Fundamentals | 5             | 3           |
| Class (hr/w) | Lect/Lab./Prac./Tutor      | SSWL (hr/sem) | USWL (hr/w) |
| 2            | 2                          | 64            | 61          |

**Description**

This course teaches students the basic of communication systems and signals their components and the types of signals in communications and how to analyze these signals from the time domain to the frequency domain vice versa using series and Fourier transforms. Also, this course makes the students create types of passive filters and active filters used in the communication system and how to design these filters

**Module 19**

| Code         | Course/Module Title   | ECTS          | Semester    |
|--------------|-----------------------|---------------|-------------|
| MTU1003      | English Language II   | 2             | 3           |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 1            | 1                     | 33            | 17          |

**Description**

This course combines solid grammar and practice, vocabulary development, and integrated skills with communicative role-plays and personalization. Authentic material from a variety of sources enables students to see a new language in context, and a range of comprehension tasks, language and vocabulary exercises, and extension activities practice the four skills. 'Everyday English' and 'Spoken grammar' sections practice real-world speaking skills, and a writing section for each unit at the back of the book provides models for students to analyze and imitate.

**Module 20**

| Code         | Course/Module Title            | ECTS          | Semester    |
|--------------|--------------------------------|---------------|-------------|
| MTU1007      | The Crimes of the Baath Regime | 2             | 3           |
| Class (hr/w) | Lect/Lab./Prac./Tutor          | SSWL (hr/sem) | USWL (hr/w) |

|                                                                                                                                                                                                                                                                                            |  |    |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|----|
| 2                                                                                                                                                                                                                                                                                          |  | 33 | 17 |
| <b>Description</b>                                                                                                                                                                                                                                                                         |  |    |    |
| this course, It provides an explanation of the violations to which individuals were exposed In under the Baath regime, an explanation of the impact of that regime's behavior on Iraqi society, and the negative effects resulting from the Baath regime assuming power from 1968 to 2003. |  |    |    |

#### Module 21

| Code                                                                                                                                                                                             | Course/Module Title              | ECTS          | Semester    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------|-------------|
| CET2201                                                                                                                                                                                          | Advanced Engineering Mathematics | 5             | 4           |
| Class (hr/w)                                                                                                                                                                                     | Lect/Lab./Prac./Tutor            | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                | 1                                | 48            | 77          |
| <b>Description</b>                                                                                                                                                                               |                                  |               |             |
| The course is oriented towards providing the 2nd year students with advanced material to perform complicated engineering and technical application mathematical analysis of their specialization |                                  |               |             |

#### Module 22

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Course/Module Title   | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET2202                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Python Programming    | 4             | 4           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2                     | 64            | 36          |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                       |               |             |
| Design and implement Python programs to solve a variety of computational problems. Utilize Python libraries and modules to streamline development and enhance functionality. Analyze and manipulate data using Python's built-in data structures and libraries. Create interactive and user-friendly graphical user interfaces (GUIs) using Python frameworks. Develop web applications and APIs using Python frameworks like Django or Flask. Apply object-oriented programming concepts in Python to design and implement reusable code. Implement error-handling and exception-handling techniques to ensure program reliability. Collaborate with peers to develop and debug Python programs through pair programming and code reviews. Utilize Python's extensive standard library and third-party packages for efficient and effective programming. Deploy and maintain Python applications on various platforms and environments. |                       |               |             |

#### Module 23

| Code         | Course/Module Title   | ECTS          | Semester    |
|--------------|-----------------------|---------------|-------------|
| CET2203      | Microprocessors       | 5             | 4           |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
|              |                       |               |             |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |    |    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|----|
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2 | 64 | 61 |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |   |    |    |
| <p>In this course, the students learn in depth the architecture of a computer system designed based on specific microprocessors. It gives the students the knowledge of operational attributes, structural design, and interfacing of such specific processor computer system components. Also, it makes the students able to encode programs using the specific processor instruction set. Moreover, the students learn to solve problems encountered in the hardware and software of the microprocessor</p> |   |    |    |

#### Module 24

| Code                                                                                                                                                                                                                                                                                                                                                                                                     | Course/Module Title   | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET2204                                                                                                                                                                                                                                                                                                                                                                                                  | Analog Communications | 5             | 4           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                             | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                        | 2                     | 64            | 61          |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                       |                       |               |             |
| <p>The course aims to enable students to learn analog communications, analog modulation types, and demodulating signals with amplitude, frequency, and phase modulation. Analyze the noise in communication systems AM systems &amp; Noise in FM Systems. Also, this course makes the students design a transmission line in communications and the Smith Chart application in communication systems</p> |                       |               |             |

#### Module 25

| Code                                                                                                                                                                                   | Course/Module Title   | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET2205                                                                                                                                                                                | Electronics Circuits  | 5             | 4           |
| Class (hr/w)                                                                                                                                                                           | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                      | 2                     | 64            | 61          |
| <b>Description</b>                                                                                                                                                                     |                       |               |             |
| <p>This course introduces the student to the applications of transistors and their various roles in electronics circuits. It provides a solid foundation for the theoretical side.</p> |                       |               |             |

#### Module 26

| Code               | Course/Module Title             | ECTS          | Semester    |
|--------------------|---------------------------------|---------------|-------------|
| CET2206            | Instrumentation and Measurement | 4             | 4           |
| Class (hr/w)       | Lect/Lab./Prac./Tutor           | SSWL (hr/sem) | USWL (hr/w) |
| 2                  | 2                               | 64            | 36          |
| <b>Description</b> |                                 |               |             |

In this course, the student can acquire the basic knowledge of measurement principles and their application in electrical engineering. Students will be learned about Electrical Measuring Instruments and Units. The students will be able to effectively employ electrical and electronic instruments for Measuring different electrical quantities like current, voltage, power, energy, power factor, frequency, etc. Select and use suitable sensors and transducers for measurements of different non-electrical quantities

#### Module 27

| Code                                                                                                                                                                                                                                                                                                                      | Course/Module Title   | ECTS          | Semester    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| MTU1009                                                                                                                                                                                                                                                                                                                   | Arabic Language II    | 2             | 4           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                              | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                         |                       | 33            | 17          |
| <b>Description</b>                                                                                                                                                                                                                                                                                                        |                       |               |             |
| Teach the students the proper use of the Arabic language in their formal communication, especially written as they become members of a working body whether in the private or public sector. Clear and concise communicable language is a must in any work environment and this course delivers on the clarity component. |                       |               |             |

#### Module 28

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Course/Module Title   | ECTS          | Semester    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET3101                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Operating Systems     | 5             | 5           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2                     | 64            | 61          |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |               |             |
| This course is designed to provide students with a foundational understanding of operating systems, the distinction between kernel and user modes, the concepts of application program interfaces, and the methods and implementations of interrupts. Schedulers, policies, processes, threads, memory management, virtual memory, protection, access control, and authentication are introduced to the students. Students are instructed in system calls for industry-standard prevalent operating systems |                       |               |             |

#### Module 29

| Code               | Course/Module Title              | ECTS          | Semester    |
|--------------------|----------------------------------|---------------|-------------|
| CET3102            | Control Engineering Fundamentals | 5             | 5           |
| Class (hr/w)       | Lect/Lab./Prac./Tutor            | SSWL (hr/sem) | USWL (hr/w) |
| 2                  | 2                                | 64            | 61          |
| <b>Description</b> |                                  |               |             |

the Control Engineering Fundamentals course aims to equip students with a robust comprehension of fundamental control system principles, mathematical modeling techniques, system analysis, design methodologies, and practical applications pertinent to the field of control engineering.

#### Module 30

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Course/Module Title       | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------|-------------|
| CET3103                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Digital Signal Processing | 5             | 5           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lect/Lab./Prac./Tutor     | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2                         | 64            | 61          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                           |               |             |
| This course introduces the processing of discrete-time (DT) signals. Fundamental principles of DT systems and signals, in both time and Fourier domains, are presented. These are followed by modern applications of digital signal processing in electronic, computer and information engineering. Throughout the course, the focus is on developing techniques and algorithms for solving discrete-time convolution, difference equations, the z-transform, and the discrete Fourier transform. Designing of both recursive and non-recursive digital filters. |                           |               |             |

#### Module 31

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Course/Module Title   | ECTS          | Semester    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET3104                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Digital Controllers   | 5             | 5           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                     | 64            | 61          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                       |               |             |
| <p>The course aims to provide students with information and prepare them to be able to know the types of Microcontrollers and its architecture as well as the difference between the microcontroller and microprocessor. It also enables the students to deal with the internal parts of the Microcontroller and gets them into programming the PIC Microcontrollers. Moreover, it goes into connecting the Microcontrollers with peripherals to input and output the information.</p> <p>The course also has the students know the PLC controller with its internal architecture and have the students to program the PLC with the Peripherals devices.</p> |                       |               |             |

#### Module 32

| Code         | Course/Module Title    | ECTS          | Semester    |
|--------------|------------------------|---------------|-------------|
| CET3105      | Digital Communications | 5             | 5           |
| Class (hr/w) | Lect/Lab./Prac./Tutor  | SSWL (hr/sem) | USWL (hr/w) |
| 2            | 2                      | 64            | 61          |
| Description  |                        |               |             |

This course introduces the student to a field of study that focuses on the transmission and reception of information using digital signals. It encompasses various technologies and techniques used to efficiently transmit and process data over different communication channels.

The course covers the understanding of key concepts such as modulation, encoding, multiplexing, error detection and correction, and signal processing. Modulation techniques for digital data, such as amplitude shift keying (ASK), frequency shift keying (FSK), and phase shift keying (PSK), are used to convert digital data into analog signals suitable for transmission over various media.

#### Module 33

| Code                                                                                                                                                                                                                                                   | Course/Module Title          | ECTS          | Semester    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------|-------------|
| CET3201                                                                                                                                                                                                                                                | Advanced Control Engineering | 5             | 6           |
| Class (hr/w)                                                                                                                                                                                                                                           | Lect/Lab./Prac./Tutor        | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                      | 2                            | 64            | 61          |
| <b>Description</b>                                                                                                                                                                                                                                     |                              |               |             |
| the Advanced Control Engineering course aims to provide students with an extensive grasp of stability analysis techniques applicable to control systems, as well as the ability to optimize control systems to achieve enhanced stability performance. |                              |               |             |

#### Module 34

| Code                                                                                                                                                                                                                                                                                                                  | Course/Module Title           | ECTS          | Semester    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------|-------------|
| CET3202                                                                                                                                                                                                                                                                                                               | Computer Network Fundamentals | 5             | 6           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                          | Lect/Lab./Prac./Tutor         | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                     | 2                             | 64            | 61          |
| <b>Description</b>                                                                                                                                                                                                                                                                                                    |                               |               |             |
| This course introduces data and information communication and networking over computer networks and covers fundamental topics to enable a seamless exchange of data between any two points in the world by enabling students to design and build networks. This exchange of data takes place over a computer network. |                               |               |             |

#### Module 35

| Code                                                                                                                                                                                                                                                                                                                                                                                      | Course/Module Title   | ECTS          | Semester    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET3203                                                                                                                                                                                                                                                                                                                                                                                   | Database Systems      | 5             | 6           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                              | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                         | 2                     | 64            | 61          |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                        |                       |               |             |
| This course presents the fundamental concepts of database design and use. It provides a study of data models, data description languages, and query facilities including relational algebra and SQL, data normalization, transactions, and their properties, physical data organization and indexing, security issues, and object databases. It also looks at the new trends in databases |                       |               |             |

**Module 36**

| Code                                                                                                                                                                                                                                                                                                                              | Course/Module Title   | ECTS          | Semester    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET3204                                                                                                                                                                                                                                                                                                                           | Engineering Analysis  | 5             | 6           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                      | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                 | 2                     | 64            | 61          |
| Description                                                                                                                                                                                                                                                                                                                       |                       |               |             |
| <p>This course can utilize different mathematical techniques in environmental engineering, as well as Applying statistical theories, mathematical theories, and laws in solving engineering problems. • It also provides engineering students with advanced analytical techniques that can be used for their future research.</p> |                       |               |             |

**Module 37**

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Course/Module Title   | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET3205                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Data communications   | 5             | 6           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1                     | 64            | 61          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |               |             |
| <p>The course covers the understanding of key concepts such as modulation, encoding, multiplexing, error detection and correction, and signal processing. Modulation techniques for digital data, Differential Phase Shift Keying (DPSK); Quadrature Phase Shift Keying (QPSK); Offset QPSK (OQPSK); <math>\pi/4</math> QPSK; Quadrature Amplitude Modulation (QAM); M-Ary Frequency Shift Keying (M-Ary FSK); Minimum Shift Keying (MSK); Gaussian Minimum Shift Keying (GMSK). And Advantages and Disadvantages; Pseudo Noise Sequence (PN Sequence) Generation and Properties; Direct Sequence Spread Spectrum; Frequency Hopping Spread Spectrum (SFH, FFH).</p> |                       |               |             |

**Module 38**

| Code                                                                                                                                                                                                                                                                                     | Course/Module Title           | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------|-------------|
| CET4101                                                                                                                                                                                                                                                                                  | Information Theory and Coding | 6             | 7           |
| Class (hr/w)                                                                                                                                                                                                                                                                             | Lect/Lab./Prac./Tutor         | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                        | 2                             | 64            | 86          |
| Description                                                                                                                                                                                                                                                                              |                               |               |             |
| <p>The course aims to introduce to the students the concepts of the amount of information, entropy, channel capacity, source coding (data compression), error-detection and error-correction codes, block coding, convolutional coding, and other related algorithms and techniques.</p> |                               |               |             |

**Module39**

| Code                                                                                                                                                                                                                                                                                                                                                                                                    | Course/Module Title         | ECTS          | Semester    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------|-------------|
| CET4102                                                                                                                                                                                                                                                                                                                                                                                                 | Computer Networks Protocols | 6             | 7           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                            | Lect/Lab./Prac./Tutor       | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                       | 2                           | 64            | 86          |
| Description                                                                                                                                                                                                                                                                                                                                                                                             |                             |               |             |
| This course will provide the students with a comprehensive overview of advanced topics in network protocols and networked systems. It will examine a wide range of topics, e.g., routing, congestion control, network architectures, data center networks, network virtualization, software-defined networking, and programmable networks, with an emphasis on core networking concepts and principles. |                             |               |             |

**Module40**

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Course/Module Title   | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET4103                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Mobile Communications | 6             | 7           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2                     | 64            | 86          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                       |               |             |
| This course aims to guide the student in the world of mobile communications by first going through the evolution of mobile communications and getting familiar with the types of Wireless communication systems, Cellular radio, and personal communication. Then it delves into the Cellular systems and the concepts of frequency reuse, S/I ratio consideration and calculation for Minimum Co-channel and adjacent interference, Handoff strategies, System-cell splitting & Cell sectorization.<br>Free Space Propagation loss equation Path-loss, Link budget design, and Multiple Access Techniques which when combined form a solid foundation for the student to pursue a career in the telecom sector. |                       |               |             |

**Module 41**

| Code                                                                                                                           | Course/Module Title    | ECTS          | Semester    |
|--------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------------|
| CET4104                                                                                                                        | Engineering Management | 5             | 7           |
| Class (hr/w)                                                                                                                   | Lect/Lab./Prac./Tutor  | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                              | 2                      | 64            | 61          |
| Description                                                                                                                    |                        |               |             |
| Course Objectives: Giving students from engineering majors knowledge about project management concepts and their applications. |                        |               |             |

**Module 42**

| Code    | Course/Module Title | ECTS | Semester |
|---------|---------------------|------|----------|
| MTU1008 | Professional Ethics | 3    | 7        |

| Class (hr/w)                                                                                                                                                                                                                                                                                | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| 2                                                                                                                                                                                                                                                                                           |                       | 33            | 17          |
| <b>Description</b>                                                                                                                                                                                                                                                                          |                       |               |             |
| This course introduces the engineer to the best practices of the engineering profession. The ethical code to be followed in the workplace. It also throws the moral component in the decision-making process which moves the needle from a purely technical form to a moral-technical form. |                       |               |             |

#### Module 43

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Course/Module Title        | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------|-------------|
| CET4201                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Fiber Optics communication | 5             | 8           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Lect/Lab./Prac./Tutor      | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2                          | 64            | 61          |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                            |               |             |
| In this course, the student can acquire the basic knowledge of fiber optics communication principles and their application. Students will be learned about high-speed single mode and low-speed multimode fiber, step and graded refractive index profiles, different dispersion mechanisms and their effect on high-speed links, the advantage of coherent (LASER) light sources over incoherent (LED) sources for the long haul, high-speed links, photodetectors. |                            |               |             |

#### Module 44

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Course/Module Title          | ECTS          | Semester    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------|-------------|
| CET4202                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Advanced Computer Technology | 5             | 8           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Lect/Lab./Prac./Tutor        | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2                            | 64            | 61          |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |               |             |
| the course aims to provide students with information and prepare them to be able to: understand the $\mu P$ and its architecture and the addressing modes. getting familiar with the following concepts: paging mechanism, segment translation, page translation, cache memory, cache organization, fully associative, direct mapped, and set associative. in addition, the course delves into the cache memory used for 80386 as well as direct maps, two-way set associative, intel's Pentium and its features, Pentium pro, out-of-order execution, other Pentium processors, and core processor. |                              |               |             |

#### Module 45

| Code | Course/Module Title | ECTS | Semester |
|------|---------------------|------|----------|
|------|---------------------|------|----------|

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                             |                      |                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------|--------------------|
| <b>CET4203</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Network Security &amp; Cybersecurity</b> | 5                    | 8                  |
| <b>Class (hr/w)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Lect/Lab./Prac./Tutor</b>                | <b>SSWL (hr/sem)</b> | <b>USWL (hr/w)</b> |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2                                           | 64                   | 61                 |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                             |                      |                    |
| <p>This course will provide students with foundational knowledge and skills in managing cybersecurity risks and threats at an organizational level. Students will learn the nature and magnitude of current cyber threats; case studies in threat prevention and incident handling; strategies for organizational risk management of cyber threats; organizational mechanisms policies and procedures for minimizing the risks and costs associated with breaches; current trends and developments in threats and mitigation; resources identifying new threats and approaches to mitigation.</p> |                                             |                      |                    |

#### **Module 46**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                              |                      |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|--------------------|
| <b>Code</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Course/Module Title</b>   | <b>ECTS</b>          | <b>Semester</b>    |
| <b>CET4204</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Cloud Computing</b>       | 5                    | 8                  |
| <b>Class (hr/w)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Lect/Lab./Prac./Tutor</b> | <b>SSWL (hr/sem)</b> | <b>USWL (hr/w)</b> |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2                            | 64                   | 61                 |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |                      |                    |
| <p>The course will introduce this domain and cover the topics of cloud infrastructures, virtualization, software-defined networks and storage, cloud storage, and programming models. As an introduction, we will discuss the motivating factors, benefits, and challenges of the cloud, as well as service models, service level agreements (SLAs), security, example cloud service providers, and use-cases. The course also provides hands-on experience through projects utilizing public cloud infrastructures (Amazon Web Services (AWS) and Microsoft Azure as well as other open-source projects like Proxmox.</p> |                              |                      |                    |

#### **Module 47**

|                                                                                                                                                                                                                                                                                                    |                              |                      |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------|--------------------|
| <b>Code</b>                                                                                                                                                                                                                                                                                        | <b>Course/Module Title</b>   | <b>ECTS</b>          | <b>Semester</b>    |
| <b>CET4205</b>                                                                                                                                                                                                                                                                                     | <b>Project</b>               | 5                    | 8                  |
| <b>Class (hr/w)</b>                                                                                                                                                                                                                                                                                | <b>Lect/Lab./Prac./Tutor</b> | <b>SSWL (hr/sem)</b> | <b>USWL (hr/w)</b> |
|                                                                                                                                                                                                                                                                                                    | 4                            | 62                   | 63                 |
| <b>Description</b>                                                                                                                                                                                                                                                                                 |                              |                      |                    |
| <p>The project enables the student to demonstrate his ability in building, implementing, and programming a system (hardware, software, or both) where he reflects his analytical thinking and the acquired technical skills as well as the theoretical foundation in getting the project done.</p> |                              |                      |                    |

#### **Module 48**

|                     |                              |                      |                    |
|---------------------|------------------------------|----------------------|--------------------|
| <b>Code</b>         | <b>Course/Module Title</b>   | <b>ECTS</b>          | <b>Semester</b>    |
| <b>CET3106</b>      | <b>Real-Time Systems</b>     | 5                    | 5                  |
| <b>Class (hr/w)</b> | <b>Lect/Lab./Prac./Tutor</b> | <b>SSWL (hr/sem)</b> | <b>USWL (hr/w)</b> |
|                     |                              |                      |                    |

|                                                                                                                                                                                                                                                                                                                                                     |   |    |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|----|
| 2                                                                                                                                                                                                                                                                                                                                                   | 2 | 64 | 61 |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                  |   |    |    |
| This course covers the theoretical and practical concepts for systems and introduces the component of time in the output. Thus, it introduces the students to a new paradigm of concepts where the signal must be dealt with in a scoped time. Hence various hardware designs, components and circuits are introduced to facilitate such operation. |   |    |    |

#### Module 49

| Code                                                                                                                                                                                                                                                                                                                                                                                                                            | Course/Module Title   | ECTS          | Semester    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET3107                                                                                                                                                                                                                                                                                                                                                                                                                         | Parallel Computing    | 5             | 5           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                    | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                               | 2                     | 64            | 61          |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                              |                       |               |             |
| This course is to familiarize students with the fundamental concepts, techniques, and tools of parallel computing. Participation in this course will enable you to better use parallel computing in your application area. The students in this course will understand how parallel computing has now become universal, from multicore computing on-chip to large-scale cluster computing, Grid computing, and Cloud computing. |                       |               |             |

#### Module 50

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                      | Course/Module Title      | ECTS          | Semester    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------|-------------|
| CET3206                                                                                                                                                                                                                                                                                                                                                                                                                                   | Digital Image Processing | 5             | 6           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                              | Lect/Lab./Prac./Tutor    | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2                        | 64            | 61          |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                        |                          |               |             |
| The students will learn the material by implementing and investigating image-processing algorithms in MATLAB. With the emphasis being on the general principles of image processing. Digital image processing is the use of algorithms and mathematical models to process and analyze digital images. Digital image processing aims to enhance image quality, extract meaningful information from images, and automate image-based tasks. |                          |               |             |

#### Module 51

| Code         | Course/Module Title   | ECTS          | Semester    |
|--------------|-----------------------|---------------|-------------|
| CET3207      | IoT Fundamentals      | 5             | 6           |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2            | 2                     | 64            | 61          |

**Description**

The Internet of Things is a course that deals with the study of how devices are connected and how it helps to stay connected over the Internet. The course teaches individuals how the Internet of Things is helpful in our daily lives and how to stay connected over the Internet. The students will understand how the IoT is bridging the gap between operational and information technology systems.

**Module 52**

| Code                                                                                                                                                                                                                                                                                   | Course/Module Title     | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------|-------------|
| CET4105                                                                                                                                                                                                                                                                                | Artificial Intelligence | 5             | 7           |
| Class (hr/w)                                                                                                                                                                                                                                                                           | Lect/Lab./Prac./Tutor   | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                      | 2                       | 64            | 61          |
| Description                                                                                                                                                                                                                                                                            |                         |               |             |
| This course aims to make the student able to identify the fundamentals of artificial intelligence networks and their types. Furthermore, to know the difference between artificial neural networks and biological neural networks. Moreover, to study the types of training algorithms |                         |               |             |

**Module 53**

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Course/Module Title   | ECTS          | Semester    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-------------|
| CET4106                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Web Design            | 5             | 7           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2                     | 64            | 61          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                       |               |             |
| This course introduces students to the principles and practices of web architecture and design. Students will learn the essential concepts, tools, and techniques required to create modern and user-friendly websites. The course covers topics such as HTML, CSS, JavaScript, responsive design, user experience (UX) design, and web graphics. Through hands-on projects and assignments, students will develop the skills necessary to design and implement effective web interfaces. |                       |               |             |

**Module 54**

| Code                                                                                                                                                                    | Course/Module Title             | ECTS          | Semester    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------|-------------|
| CET4107                                                                                                                                                                 | Distributed Computing & Systems | 5             | 7           |
| Class (hr/w)                                                                                                                                                            | Lect/Lab./Prac./Tutor           | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                       | 2                               | 64            | 61          |
| Description                                                                                                                                                             |                                 |               |             |
| This course covers general introductory concepts in the design and implementation of distributed systems, covering all the major branches such as Cloud Computing, Grid |                                 |               |             |

Computing, Cluster Computing, Supercomputing, and Many-core Computing. The topics that are within the scope of this course are: scheduling in multiprocessors, memory hierarchies, synchronization, concurrency control, fault tolerance, data-parallel programming models, scalability studies, distributed memory message passing systems, shared memory programming models, tasks, fundamental parallel algorithms, parallel programming exercises, parallel algorithm design techniques, interconnection topologies, heterogeneity, load balancing, memory consistency model, asynchronous computation, Amdahl's Law.

#### Module 55

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Course/Module Title              | ECTS          | Semester    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------|-------------|
| CET4206                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Reconfigurable Computing Systems | 5             | 8           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Lect/Lab./Prac./Tutor            | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2                                | 64            | 61          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                  |               |             |
| This course is designed to offer an introduction to the principles of modern Reconfigurable Computing Systems (RCS). The emphasis is on understanding the concepts of architecture reconfigurability, programmable logic devices, and adaptation of the RCS architecture to the task algorithm and data structure. The course covers the hardware basics of the modern RCS – fine and coarse-grained programmable logic devices: Field Programmable Gate Arrays (FPGA) and Coarse-Grained Reconfigurable Arrays (CGRA). |                                  |               |             |

#### Module 56

| Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Course/Module Title      | ECTS          | Semester    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------|-------------|
| CET4207                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Wireless Sensor Networks | 5             | 8           |
| Class (hr/w)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Lect/Lab./Prac./Tutor    | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2                        | 64            | 61          |
| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                          |               |             |
| Understand the fundamentals of wireless sensor networks and their applications. Explore the components and architecture of wireless sensor networks. Learn about different types of wireless sensors and their characteristics. Design and configure wireless sensor networks for data collection and monitoring. Study the protocols and algorithms used in wireless sensor networks for efficient communication. Gain practical experience in deploying and configuring wireless sensor nodes. Analyze and interpret data collected from wireless sensor networks using appropriate tools. Investigate energy-efficient techniques for prolonging the lifespan of wireless sensor networks. Collaborate with peers to develop projects that utilize wireless sensor networks. Explore emerging trends and advancements in wireless sensor networks and their potential applications. |                          |               |             |

**Module 57**

| Code                                                                                                                                                                                                                                                                                                    | Course/Module Title     | ECTS          | Semester    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------|-------------|
| CET4208                                                                                                                                                                                                                                                                                                 | Optimization Algorithms | 5             | 8           |
| Class (hr/w)                                                                                                                                                                                                                                                                                            | Lect/Lab./Prac./Tutor   | SSWL (hr/sem) | USWL (hr/w) |
| 2                                                                                                                                                                                                                                                                                                       | 2                       | 64            | 61          |
| Description                                                                                                                                                                                                                                                                                             |                         |               |             |
| This course aims to teach the students the basics of optimization algorithms, as well as the most important concepts on which optimization algorithms are based. In addition, teaching the students the most important optimization algorithms will focus on genetic algorithms and their applications. |                         |               |             |