MODULE DESCRIPTION FORM

الدراسية

المادة

وصف

نموذج

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| **Module Information**معلومات المادة الدراسية |
| **Module Title** | **Fundamental of Electrical Eng.** | **Module Delivery** |
| **Module Type** | **Core** | ☒ **Theory*** **Lecture**

☒ **Lab**☒ **Tutorial*** **Practical**
* **Seminar**
 |
| **Module Code** | **CSTE1102** |
| **ECTS Credits** | **6** |
| **SWL (hr/sem)** | **150** |
| **Module Level** | 1 | **Semester of Delivery** | 1 |
| **Administering Department** | CSTE | **College** | Al-Hikma |
| **Module Leader** | Ayman Khalil Ibrahim | **e-mail** | ayman@hiuc.edu.iq |
| **Module Leader’s Acad. Title** | Lecturer | **Module Leader’s Qualification** | MSc |
| **Module Tutor** | Prof. Zaki Saeed Tawfik | **e-mail** | Zeki.saeed@hiuc.edu.iq |
| **Peer Reviewer Name** | Prof. Zaki Saeed Tawfik | **e-mail** | Prof. Zaki Saeed Tawfik |
| **Scientific Committee Approval Date** | 18/11/2023 | **Version Number** | 1.0 |

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| **Relation with other Modules**العالقة مع المواد الدراسية األخرى |
| **Prerequisite module** | None | **Semester** |  |
| **Co-requisites module** | None | **Semester** |  |

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| **Module Aims, Learning Outcomes and Indicative Contents**أهداف المادة الدراسية ونتائج التعلم والمحتويات اإلرشادية |
| **Module Aims**أهداف المادة الدراسية | 1. To develop problem solving skills and understanding of circuit theory through the application of techniques.
2. To understand voltage, current and power from a given circuit.
3. This course deals with the basic concept of electrical circuits.
4. This is the basic subject for all electrical and electronic circuits.
5. To understand Kirchhoff's current and voltage Laws problems.
6. To perform Thevenin’s Norton’s Theorem.
7. Understanding the Alternating Current Network Types of Alternating Waveforms
8. Understanding the basic principle of series and parallel AC Circuit
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| **Module Learning Outcomes**مخرجات التعلم للمادة الدراسية | 1. Recognize how electricity works in electrical circuits.
2. List the various terms associated with electrical circuits.
3. Summarize what is meant by a basic electric circuit.
4. Discuss the reaction and involvement of atoms in electric circuits.
5. Describe electrical power, charge, and current.
6. Define Ohm's law.
7. Identify the basic circuit elements and their applications.
8. Discuss the operations of DC circuits in an electric circuit.
9. Discuss the various properties of resistors.
10. Explain the two Kirchhoff’s laws used in circuit analysis.
11. Describe Thevenin's theorem and Norton's theorem and how they work
12. Explain the basic concepts o AC Circuits.
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| **Indicative Contents**المحتويات اإلرشادية | Indicative content includes the following. Definition: -Symbols And Abbreviations, Units, Electric Circuit & It’s Element. The Direct Current Network.Ohms low, Charge, Force, Work, Power. Circuit TheoryDC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff’s laws and Ohm’s law. Anatomy of a circuit, Network reductionRevision problem classes |

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|  | FundamentalsResistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, Conversion Delta To Star Connection, Superposition Method. |
| **Learning and Teaching Strategies**استراتيجيات التعلم والتعليم |
| **Strategies** | Type something like: The main strategy that will be adopted in delivering this module is to encourage students’ participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students. |

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| **Student Workload (SWL)**الحمل الدراسي للطالب |
| **Structured SWL (h/sem)**الحمل الدراسي المنتظم للطالب خالل الفصل | 79 | **Structured SWL (h/w)**الحمل الدراسي المنتظم للطالب أسبوعيا | 5 |
| **Unstructured SWL (h/sem)**الحمل الدراسي غير المنتظم للطالب خالل الفصل | 71 | **Unstructured SWL (h/w)**الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5 |
| **Total SWL (h/sem)**الحمل الدراسي الكلي للطالب خالل الفصل | 150 |

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| **Module Evaluation**تقييم المادة الدراسية |
|  | **Time/Nu****mber** | **Weight (Marks)** | **Week Due** | **Relevant Learning****Outcome** |
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5, 10 | LO #1, 2, 10 and 11 |
| **Assignments** | 2 | 10% (10) | 2, 12 | LO # 3, 4, 6 and 7 |
| **Projects / Lab.** | 8 | 15% (15) | Continuous |  |
| **Report** | 1 | 5% (5) | 13 | LO # 5, 8 and 10 |
| **Summative****assessment** | **Midterm Exam** | 2hr | 10% (10) | 7 | LO # 1-7 |
| **Final Exam** | 4hr | 50% (40 + 10) | 16 | All |
| **Total assessment** | 100% (100 Marks) |  |  |

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| **Delivery Plan (Weekly Syllabus)**المنهاج االسبوعي النظري |
|  | **Material Covered** |
| **Week 1** | Symbols And Abbreviations, Units, Electric Circuit & its Element, Ohms low. |
| **Week 2** | Series Circuits (Resistance in Series) Voltage Divider Rule. |
| **Week 3** | Parallel Circuits (Resistances in Parallel) Current Divider Rule. |
| **Week 4** | Open and Short Circuits, Source Transformation, |
| **Week 5** | Series-Parallel Circuits Transformation. |
| **Week 6** | Kirchhoff's Laws: Kirchhoff’s current law (KCL) and its use in Network Analysis. |
| **Week 7** | Kirchhoff’s voltage law (KVL) and its use in Network Analysis |
| **Week 8** | Conversion Delta to Star Connection and Conversion Star to Delta Connection |
| **Week 9** | Mid Term Exam + Superposition Method |
| **Week 10** | Thevenin’s Theorem |
| **Week 11** | Norton’s Theorem |
| **Week 12** | The Alternating Current Network Types of Alternating Waveforms, Generation ofAlternating Current, and Definitions related to Alternating Waveforms |
| **Week 13** | The Mean and Effective Values of Current and Voltage |
| **Week 14** | Series and Parallel AC Circuits (R L C) |
| **Week 15** | **Preparing for final Exam** |

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| **Delivery Plan (Weekly Lab. Syllabus)**المنهاج االسبوعي للمختبر |
|  | **Material Covered** |
| Week 1 | Lab 1: How to use ammeter, voltmeter and ohmmeter. |
| Week 2 | Lab 2: Apply Ohm's Law |
| Week 3 | Lab 3: Continuous Implementation for Lab1 and Lab2 |
| Week 4 | Lab 4: Apply Kirchhoff's law to measure current |
| Week 5 | Lab 5: Continuous Implementation for Lab4 |
| Week 6 | Lab 6: Apply Kirchhoff's law to measure voltages |
| Week 7 | Lab 7: Continuous Implementation for Lab6 |
| Week 8 | Lab 8: Superposition Method |
| Week 9 | Lab 9: Norton's Theorem. |

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| Week 10 | Lab 10: Continuous Implementation for Lab9 |
| Week 11 | Lab 11: Thévenin's Theorem. |
| Week 12 | Lab 12: Continuous Implementation for Lab11 |
| Week 13 | Lab 13: Delta To Star Connection And Conversion Star To Delta Connection |
| Week 14 | Lab 14: Continuous Implementation for Lab13 |
| Week 15 | Lab 15: Preparing for final Exam |

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| **Learning and Teaching Resources**مصادر التعلم والتدريس |
|  | **Text** | **Available in the****Library?** |
| **Required Texts** | Fundamentals of Electric Circuits, C.K. Alexander and M.N.OSadiku, McGraw-Hill Education | Yes |
| **Recommended Texts** | DC Electrical Circuit Analysis: A Practical ApproachCopyright Year: 2020, dissidents. | No |
| **Websites** | https://[www.coursera.org/browse/physical-science-and-engineering/electrical-](http://www.coursera.org/browse/physical-science-and-engineering/electrical-)engineering |

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| **Grading Scheme**مخطط الدرجات |
| **Group** | **Grade** | التقدير | **Marks (%)** | **Definition** |
| **Success Group (50 - 100)** | **A -** Excellent | امتياز | 90 - 100 | Outstanding Performance |
| **B -** Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| **C -** Good | جيد | 70 - 79 | Sound work with notable errors |
| **D -** Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| **E -** Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX –** Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| **F –** Fail | راسب | (0-44) | Considerable amount of work required |
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| **Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automaticrounding outlined above. |