**TEMPLATE FOR COURSE SPECIFICATION**

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| **Electrical Engineering** |

**COURSE SPECIFICATION**

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| This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification. |

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| College of Engineering  University of Baghdad | ***1. Teaching Institution*** |
| Mechanical Engineering Department (MED) | ***2. University Department/Centre*** |
| **Electrical Engineering/ ME105**  It is an annual course given to the first grade students of Mechanical Engineering to get a basic knowledge about the electrical technology and to have the ability to understand and analyze the direct current (D.C) and alternating current (AC) networks. | ***3. Course title/code& Description*** |
| Mechanical Engineering (ME) | ***4. Programme(s) to which itContributes*** |
| Annual System; The academic year consists around 25-week, it depends on the date of the first grade students in the program involvement. | ***5. Modes of Attendance offered*** |
| 2 hours/ week; about 50 hrs a year | ***7. Number of hours tuition (total)*** |
| October - 2018 | ***8. Date of production/revision of this specification*** |
| ***9. Aims of the Course***  ***- To introduce the student of mechanical engineering by the principles of electrical technology.***  ***- Providing the student by the basic knowledge of electrical network and systems analysis that the mechanical engineer needs during the professional work as an integrated science of engineering.*** | |

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| ***10·Learning Outcomes***   * ***The ability to define the problem, analyze it, and using the engineering methodologies of the electrical engineering to solve it.*** * ***Working in a team to find the solutions of engineering problems as integrated sciences of engineering that might face during the professional life.*** |
| ***11.Teaching and Learning Methods*** |
| Class Lectures, Seminars and Reports |
| ***12. Assessment Methods***  Exams and Reports |
| ***13. Grading Policy***    Annual grading of evaluation |

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| ***14. Course Structure*** | | | | | |
|  |  |  |  |  | Week |
|  |  |  |  | Units of Measurement, Systems of Units, Current, Voltage, Resistance and their units of measurement | 1 |
|  |  |  |  | Ohm’s Law, Power, Energy, and Efficiency | 2 |
|  |  |  |  | DC Circuits Analysis: Series Circuits, Voltage Divider Rule | 3 |
|  |  |  |  | Parallel Circuits, Total Conductance, and Current Divider Rule | 4 |
|  |  |  |  | Kirchhoff’s Voltage and Current Laws | 5 |
|  |  |  |  | Internal resistance of voltage source, Measurement Technique , Sources conversion method | 6 |
|  |  |  |  | Series Parallel Networks | 7 |
|  |  |  |  | Methods of Analysis (DC Circuits): Mesh Analysis | 8 |
|  |  |  |  | Nodal Analysis, Bridge Networks | 9 |
|  |  |  |  |  | 10 |
|  |  |  |  | Network Theorems: Superposition Theorem | 11 |
|  |  |  |  | Thevenin’s Theorem, Norton’s Theorem | 12 |
|  |  |  |  | Maximum Power Transfer Theorem | 13 |
|  |  |  |  | 1st Term Exam | 14 |
|  |  |  |  | Capacitors and Capacitance | 15 |
|  |  |  |  | Sinusoidal Alternating Current: AC voltage generation, Definitions, Sine wave general format | 16 |
|  |  |  |  | Phase Relations, Average and Effective values, The Derivative | 17 |
|  |  |  |  | Response of Basic R, L, and C Elements to Sinusoidal Voltage or Current | 18 |
|  |  |  |  | Phasors: Rectangular and Polar Forms, Mathematical Operations with complex numbers | 19 |
|  |  |  |  | Series and Parallel (Single-Phase) AC Circuits: Impedance and phasor diagram, series configuration, Voltage divider rule | 20 |
|  |  |  |  | Admittance and Susceptance, R-L-C Parallel AC Networks, Current divider rule | 21 |
|  |  |  |  | Series, Parallel AC Network, Effective Power and Power factor | 22 |
|  |  |  |  | Power in AC Networks | 23 |
|  |  |  |  | 2nd Term Exam | 24 |
|  |  |  |  | Poly-Phase Systems: 3-phase generator, Delta-Star Systems, Phase Sequence, Balanced- Unbalanced Systems, II | 25 |
|  |  |  |  | Poly-Phase Systems: 3-phase generator, Star-Delta Systems, Phase Sequence, Balanced- Unbalanced Systems, I | 26 |
|  |  |  |  | Power in 3-Phase Systems | 27 |
|  |  |  |  | 3rd Term Exam | 28 |
|  |  |  |  | Transformers I | 29 |
|  |  |  |  | Transformers II | 30 |

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| ***15. Infrastructure*** | | |
| Instructor Notes, and References such as: Boylasted; Introductory of Circuits Analysis | Required reading:  · CORE TEXTS  · COURSE MATERIALS  · OTHER | |
| Lab. Experiments of DC and AC circuits analysis | Special requirements (include for example workshops, periodicals, IT software, websites) | |
| Encourage students to use the internet for searching and problems solving | Community-based facilities  (include for example, guest  Lectures , internship, field studies) | |
| ***16. Admissions*** | | |
|  | | Pre-requisites |
| 30 students | | Minimum number of students |
| 36 students | | Maximum number of students |
|  | | ***17. Course Instructors*** |