**COURSE SPECIFICATION**

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| Baghdad University | 1. Teaching Institution |
| College of Engineering/Department of Electrical Engineering | 2. University Department/Centre |
| Electric Machine I  | 3. Course title/code |
| Electrical Engineering | 4. Programme(s) to which it contributes |
| Internal | 5. Modes of Attendance offered |
| Second Year Class | 6. Semester/Year |
| 90 | 7. Number of hours tuition (total) |
| 2015-2016 | 8. Date of production/revision of this specification  |
| 9. Aims of the Course |
| The aim of this course is to introduce the basic theory of dc machine and transformers, learn the construction of dc machine, and enhance the students’ skills for the principles of commutation and armature reaction. Then they learn various types of dc machines including characteristics. |

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| 10· Learning Outcomes  |
| 1. Knowledge and Understanding

A1. Learning the construction of a dc machine A2. Understanding the armature reaction and commutation.A3. Understanding the analysis of the transformers.A4. Explaining the losses in Transformers. |
|  B. Subject-specific skillsB1. Analyzing the types of armature winding, Lap and wave windings function B2.presenting the types of DC Motors and GeneratorsB3. Illustrate the types of D.C. motors, power equation,B4. Demonstrating the Transformer, types, and presenting the equivalent circuit of a transformerB5. Studying the Transformer efficiency and regulationB6. Studying the speed control of dc motors |
| C. Thinking Skills C1. Getting a knowledge to analysis the dc machines C2 be able to work in practical with machines and transformers |
| D. General and Transferable Skills (other skills relevant to employability and personal development) D1. Design and implement a dc machineD2. Increase ability in discussion and cooperate  |
|  11. Teaching and Learning MethodsLecturing & Class discussions12. Assessment methods  |
| Exams, quizzes 13. Grading PolicyQuizzes 20% : ( 1st semester 10% and 2nd semester 10%)midyear exam 10%final year exam:70% |

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| 14. Course Structure |
| Assessment Method | TeachingMethod | Unit/Module or Topic Title | ILOs | Hours | Week |
| Exam | Lecturing, Discussions & Exercises  | Introduction of Machinery Principles, Construction of a dc machine, yoke, poles, armature, brushes, brush gear, bearings | A+B | 3 | 1 |
| Exam | Lecturing, Discussions & Exercises | Coil pitch and distributed windings | A+B+C+D | 3 | 2 |
| Exam | Lecturing, Discussions & Exercises | Introduction to transformer principle, Phasor diagram of the transformer | A+B+C+D | 3 | 3 |
| Exam | Lecturing, Discussions & Exercises | Types of armature winding, Lap windings | A+B+C+D | 3 | 4 |
| Exam | Lecturing, Discussions & Exercises | Wave windings, comparison of Lap and wave type winding | A+B+C+D | 3 | 5 |
| Exam | Lecturing, Discussions & Exercises | Multiplex windings | A+B+C+D | 3 | 6 |
| Exam, quiz | Lecturing, Discussions & Exercises | Transformer, types, and construction of transformer | A+B+C+D | 3 | 7 |
| Exam | Lecturing, Discussions & Exercises | The E.M.F equation of a d.c machine | A+B+C+D | 3 | 8 |
| Exam | Lecturing, Discussions & Exercises | Winding topologies, single and double layer winding | A+B+C+D | 3 | 9 |
| Exam | Lecturing, Discussions & Exercises | Armature reaction | A+B+C+D | 3 | 10 |
| Exam | Lecturing, Discussions & Exercises | Commutation | A+B+C+D | 3 | 11 |
| Exam | Lecturing, Discussions & Exercises | DC Machinery Fundamentals | A+B+C+D | 3 | 12 |
| Exam | Lecturing, Discussions & Exercises | Tutorials on Transformer & dc machines | A+B+C+D | 3 | 13 |
| Exam | Lecturing, Discussions & Exercises | The per-unit system of measurements | A+B+C+D | 3 | 14 |
| Exam | Lecturing, Discussions & Exercises | DC Motors and Generators ,Self-excited dc generators | A+B+C+D | 3 | 15 |
| Exam | Lecturing, Discussions & Exercises | Shunt generator , Series generator | A+B+C+D | 3 | 16 |
| Exam | Lecturing, Discussions & Exercises | Compound generator | A+B+C+D | 3 | 17 |
| Exam | Lecturing, Discussions & Exercises | Losses of transformer | A+B+C+D | 3 | 18 |
| Exam | Lecturing, Discussions & Exercises | Voltage building in self excited dc generator | A+B+C+D | 3 | 19 |
| Exam | Lecturing, Discussions & Exercises | D.C. motors, power equation, Torque equation | A+B+C+D | 3 | 20 |
| Exam | Lecturing, Discussions & Exercises | Transformer efficiency | A+B+C+D | 3 | 21 |
| Exam | Lecturing, Discussions & Exercises | Three phase transformers | A+B+C+D | 3 | 22 |
| Exam | Lecturing, Discussions & Exercises | Types of DC motor | A+B+C+D | 3 | 23 |
| Exam | Lecturing, Discussions & Exercises | DC shunt motor | A+B+C+D | 3 | 24 |
| Exam | Lecturing, Discussions & Exercises | Three phase Transformer connections | A+B+C+D | 3 | 25 |
| Exam | Lecturing, Discussions & Exercises | Three phase transformation using two transformers, open delta connection, open wye-open delta connection, Scott connection, three phase transformer | A+B+C+D | 3 | 26 |
| Exam | Lecturing, Discussions & Exercises | DC series motor, dc compound motor | A+B+C+D | 3 | 27 |
| Exam | Lecturing, Discussions & Exercises | Speed control of dc series motor, shunt motor, compound motor | A+B+C+D | 3 | 28 |
|  |  | Rounding up | A+B+C+D | 3 | 29 |
|  |  | Final Exam |  | 3 | 30 |

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| 15. Infrastructure |
| Two text books : A. Draper, “Electrical Machines” , 2nd edition, Longman, 1979.Stephen J. Chapman, “Electric Machinery Fundamentals”, 4th edition,Mc Graw Hill, 2005. | Required reading:· CORE TEXTS· COURSE MATERIALS· OTHER |
| Internet websites, seminars  | Special requirements (include for example workshops, periodicals, IT software, websites) |
| None | Community-based facilities(include for example, guestLectures , internship , field studies) |

16. Admissions

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| Baccalaureate/ scientific branch | Pre-requisites |
| 30 | Minimum number of students |
| 40 | Maximum number of students |

17. Course Instructors

1- Dr. Hanan Habbi

2-MSc.Huda Manhi