**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 programme specification. |

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| Baghdad University | 1. Teaching Institution |
| College of Engineering/Department of Electrical Engineering | 2. University Department/Centre |
| Electric Machine I/EE203 | 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) |
| 2012 | 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, Teaching ,Learning and Assessment Method |
| 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 skills  B1. Analyzing the types of armature winding, Lap and wave windings function  B2.presenting the types of DC Motors and Generators  B3. Illustrate the types of D.C. motors, power equation,  B4. Demonstrating the Transformer, types, and presenting the construction of a transformer  B5. Studying the Transformer efficiency and regulation  B6. Studying the speed control of dc motors |
| Teaching and Learning Methods |
| Lecturing and Exercises |
| Assessment methods |
| Exams, quizzes |
| C. Thinking Skills  C1. Getting a knowledge to analysis the dc machines  C2 be able to work in practical with machines and transformers |
| Teaching and Learning Methods |
| Lecturing & Class discussions |
| Assessment methods |
| Exams , discussion |

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| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1. Design and implement a dc machine  D2. Increase ability in discussion and cooperate |

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| 11. Course Structure | | | | | |
| Assessment Method | Teaching  Method | 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,quiz | 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,quiz | 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,quiz | 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,quiz | 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, quiz | Lecturing, Discussions & Exercises | Three phase transformation using two transformers | A+B+C+D | 3 | 26 |
| Exam, quiz | 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, | A+B+C+D | 3 | 28 |
| Exam, quiz | Lecturing, Discussions & Exercises | open delta connection, open wye-open delta connection, Scott connection | A+B+C+D | 3 | 29 |
| Exam | Lecturing, Discussions & Exercises | Speed control of dc shunt motor, compound motor | A+B+C+D | 3 | 30 |

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| 12. Infrastructure Required reading: | |
| Two text books : A. Draper, “Electrical Machines” , 2nd edition, Longman, 1979.  Stephen J. Chapman, “Electric Machinery Fundamentals”, 4th edition,Mc Graw Hill, 2005. | · 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, guest  Lectures , internship , field studies) |

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| 13. Admissions | |
|  | Pre-requisites |
| 30 | Minimum number of students |
| 35 | Maximum number of students |