**COURSE SPECIFICATION**

|  |
| --- |
| 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.  |

|  |  |
| --- | --- |
| University of Baghdad-College of Engineering | 1. Teaching Institution |
| Electrical engineering Department | 2. University Department/Centre |
| Electrical machines II | 3. Course title/code |
| BSc in Electrical Engineering | 4. Programme(s) to which it contributes |
| Full time | 5. Modes of Attendance offered |
| Year 2015-2016 | 6. Semester/Year |
| 90 | 7. Number of hours tuition (total) |
| Feb. 2015 | 8. Date of production/revision of this specification  |
| 9. Aims of the Course |
| The aim of the course is to produce graduates with advanced knowledge and understanding of Electrical ac machinery principles;operation;performances, problem solving and ability to think rigorously and independently to meet higher level expectations of electrical machinery industry, academics, research  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |

|  |
| --- |
| 10· Learning Outcomes, Teaching ,Learning and Assessment Methode  |
| 1. Knowledge and Understanding

A1. Constructional details, principle of operation, Performance, starters and speed control of AC Machines.A2. Constructional details, principle of operation of Special Machines. |
|  B. Subject-specific skillsB1.B2.B3. |
|  Teaching and Learning Methods |
| 1.Face to Face Lectures.2. Seminars3. Group Exercises. |
|  Assessment methods  |
| A module assessment will have two components: 1.weekly Quizes 30% weight.2. Final written Exam. 70% weight. |
| C. Thinking Skills C1.C2.C3.C4.  |
|  Teaching and Learning Methods  |
| 1.Face to Face Lectures.2. Seminars3. Group Exercises. |
|  Assessment methods |
| A module assessment will have two components: 1.weekly Quizes 30% weight.2. Final written Exam. 70% weight. |

|  |
| --- |
| D. General and Transferable Skills (other skills relevant to employability and personal development) D1.D2.D3.D4.  |

|  |
| --- |
| 11. Course Structure |
| Assessment Method | TeachingMethod | Unit/Module or Topic Title | ILOs | Hours | Week |
| Weekly Quizes and written final Exam | Face to face lecture | Introduction to machinery principles |  | 3 | 1 |
| = | = | AC machinery principles: Generation of alternating emf |  | 3 | 2 |
| = | = | MMF of distributed windings in Ac machines |  | 3 | 3 |
| = | = | MMF of distributed windings in AC machines |  | 3 | 4 |
| = | = | Rotating mmf waves in AC machines |  | 3 | 5 |
| = | = | Synchronous generators: Construction |  | 3 | 6 |
| = | = | Synchronous generator equivalent circuit and phasor diagram |  | 3 | 7 |
| = | = | Synchronous generator: Power and torque, Measuring model parameters |  | 3 | 8 |
| = | = | Synchronous generators operating alone |  | 3 | 9 |
| = | = | Parallel operation of synchronous generators |  | 3 | 10 |
| = | = | Parallel operation of synchronous generators |  | 3 | 11 |
| = | = | Effect of salient poles |  | 3 | 12 |
| = | = | Synchronous motor: principle of operation and equivalent circuit |  | 3 | 13 |
| = | = | Steady state synchronous motor =operation |  | 3 | 14 |
| = | = | Synchronous motor: Torque –speed characteristics, effect of load changes, effect of field current changes |  | 3 | 15 |
| = | = | The synchronous capacitor, starting of synchronous motor |  | 3 | 16 |
|  |  | **Half – year break** |  |  |  |
| = | = | Three phase induction motor:Construction and basic concepts |  | 3 | 17 |
| = | = | Equivalent circuit of three phase induction motor |  | 3 | 18 |
| = | = | Power and torque of three phase induction motor |  | 3 | 19 |
| = | = | Torque speed characteristics of three phase induction motor & starting of three phase induction motor |  | 3 | 20 |
| = | = | Speed control of three phase induction motor |  | 3 | 21 |
| = | = | Determination circuit model parameters of three phase induction motor |  | 3 | 22 |
| = | = | The three phase induction generator: principle of operation |  | 3 | 23 |
| = | = | Single phase induction motor: revolving field theory and cross field theory |  | 3 | 24 |
| = | = | Starting of single phase induction motor |  | 3 | 25 |
| = | = | Speed control of single phase induction motor |  | 3 | 26 |
| = | = | The circuit model of single phase induction motor |  | 3 | 27 |
| = | = | Other types of motors: reluctance motor |  | 3 | 28 |
| = | = | Hysteresis motor |  | 3 | 29 |
| = | = | Stepper motor |  | 3 | 30 |
| = | = | Brushless dc motor |  | 3 | 31 |
| = | = | Universal motor |  | 3 | 32 |

|  |
| --- |
| 12. Infrastructure |
| 1. Module Handout
2. The fpllowing texts:

 a-Electric Machines by Gross, C.A b-Performance and design of alternating current machines by Say, M.G c-AC machines-electromagnetic and design by Chalmers, B &Williamson A. | Required reading:· CORE TEXTS· COURSE MATERIALS· OTHER |
| Prefer to arrange a visit to a factory or maintenance workshops of electrical machinery, as well as a visit to one of the electrical power generation plants | Special requirements (include for example workshops, periodicals, IT software, websites) |
|  | Community-based facilities(include for example, guestLectures , internship , field studies) |

|  |
| --- |
| 13. Admissions |
| Knowledge in DC machines and transformers | Pre-requisites |
| 50 | Minimum number of students |
| 100 | Maximum number of students |