**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 | 1. Teaching Institution |
| College of Engineering / Department of Energy | 2. University Department/Centre |
| Power Systems/322ENEP | 3. Course title/code |
| B.Sc | 4. Programme(s) to which it contributes |
| Weekly | 5. Modes of Attendance offered |
| Yearly | 6. Semester/Year |
| 105 hours | 7. Number of hours tuition (total) |
| 2018 | 8. Date of production/revision of this specification |
| 9. Aims of the Course | |
| Identify and analyze the functions, structure, characteristics, performance parameters, operation and control of power systems and its components. | |
|  | |

|  |
| --- |
| 10· Learning Outcomes, Teaching ,Learning and Assessment Methods |
| 1. Knowledge and Understanding   A1.Identify the functions structures and characteristics of the whole power system.  A2- Identify the construction, operation, equivalent circuits and performance parameters of power system components such as transformers, generators and power lines.  A3- Identify the operation and control of power system for normal conditions.  A4- Solve and analyze power flow problems. |
| B. Subject-specific skills  B1- Solve the performance parameters of power systems and its different components.  B2- Analyze the whole power system for power flow study. |
| Teaching and Learning Methods |
| Lecturing..1  Discussions with the students. .2  Solving examples..3 |
| Assessment methods |
| 1. Weekly quizzes.  2. Periodic home works.  Monthly and yearly exams..3 |
| C. Thinking Skills  C1- Learning essential engineering concepts and terms.  C2**-** Using related techniques for solving problems. |

|  |
| --- |
| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Ability to identify construction, operation and characteristic parameters of power system components.  D2-Applying the techniques of power flow study for whole power systems. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 11. Course Structure | | | | | |
| Assessment Method | Teaching  Method | Unit/Module or Topic Title | ILOs | Hours | Week |
| Theoretical tests | Lectures, examples and discussions | Basics of power systems | Characteristics of energy & power systems | 4 | 1 |
| Ditto | Ditto |  | Structure of power systems | 4 | 2 |
| Ditto | Ditto |  | Electric & magnetic circuits | 4 | 3 |
| Ditto | Ditto |  | Applications of electromagnetic interaction | 4 | 4 |
| Ditto | Ditto | Power system components:  1. Transformers | Construction & operation | 4 | 5 |
| Ditto | Ditto |  | Construction & operation | 4 | 6 |
| Ditto | Ditto |  | Equivalent circuits & its analyses | 4 | 7 |
| Ditto | Ditto |  | Equivalent circuits & its analyses | 4 | 8 |
| Ditto | Ditto | 2. Three-phase machines  A. Synchronous | Construction & operation | 4 | 9 |
| Ditto | Ditto |  | Construction & operation | 4 | 10 |
| Ditto | Ditto |  | Equivalent circuits & its analyses | 4 | 11 |
| Ditto | Ditto |  | Equivalent circuits & its analyses | 4 | 12 |
| Ditto | Ditto | B. Induction | Construction & operation | 4 | 13 |
| Ditto | Ditto |  | Equivalent circuits & its analyses | 4 | 14 |
| Ditto | Ditto |  | Equivalent circuits & its analyses | 4 | 15 |
| Ditto | Ditto | 3. Power lines | Types, characteristics and construction | 3 | 16 |
| Ditto | Ditto |  | Transmission lines parameters | 3 | 17 |
| Ditto | Ditto |  | Equivalent circuits & power calculations | 3 | 18 |
| Ditto | Ditto |  | Equivalent circuits & power calculations | 3 | 19 |
| Ditto | Ditto |  | Substations & protection equipment | 3 | 20 |
| Ditto | Ditto | Power System Analysis | System Modeling | 3 | 21 |
| Ditto | Ditto |  | General solutions for power flow study | 3 | 22 |
| Ditto | Ditto |  | General solutions for power flow study | 3 | 23 |
| Ditto | Ditto |  | Operation & Control | 3 | 24 |
| Ditto | Ditto |  | Operation & Control | 3 | 25 |
| Ditto | Ditto |  | Optimum voltages of the system | 3 | 26 |
| Ditto | Ditto |  | Examples of power system calculations | 3 | 27 |
| Ditto | Ditto |  | Examples of power system calculations | 3 | 28 |
| Ditto | Ditto |  | Examples of power system calculations | 3 | 29 |
| Ditto | Ditto |  | Examples of power system calculations | 3 | 30 |

|  |  |  |
| --- | --- | --- |
| 12. Infrastructure | | |
| 1. Electric Circuits. 2. Magnetic Circuits. 3. Electric machines. 4. Power engineering. | Required reading:  · Lectures notes  · Text books  · References | |
|  | Special requirements (include for example workshops, periodicals, IT software, websites) | |
|  | Community-based facilities  (include for example, guest  Lectures , internship , field studies) | |
| 13. Admissions | | |
|  | | Pre-requisites |
| 10 | | Minimum number of students |
| 30 | | Maximum number of students |