**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 program specification. |

|  |  |
| --- | --- |
| University of Baghdad | 1. Teaching Institution |
| College of Engineering/Department of Electrical Engineering | 2. University Department/Centre |
| Electric Power II | 3. Course title/code |
| Electrical Engineering | 4. Programme(s) to which it contributes |
| Internal | 5. Modes of Attendance offered |
| Fourth Year Class | 6. Semester/Year |
| 120 | 7. Number of hours tuition (total) |
| 2015 | 8. Date of production/revision of this specification |
| 9. Aims of the Course | |
| The student will learn the main components of the power system as well as the per unit system, also the main faults and the analysis of the power system after subjecting to the fault, the student will also learn the power system stability and its classifications, finally the load flow analysis will be learned . | |

|  |
| --- |
| 10· Learning Outcomes, Teaching ,Learning and Assessment Method |
| 1. **Knowledge and Understanding**   1. Full understanding for the global power systems and Iraqi power system.  2. Enhancing the student's skills through presenting real cases.  3. Cooperation with experiences and engineers in industry and in electricity sector in order to transport their knowledge to our students.  4. Involving the students in seminars and workshops to increase his skills through preparing a short seminar.  5. Preparing for small visits to some power stations and electricity control centers. |
| **B. Subject-specific skills**  1. full understanding for some power systems and Iraqi power system.  2. learning the students how to read the power station and power network manuals and flowcharts.  3. some knowledge in mathematics and numerical analysis. |
| **Teaching and Learning Methods** |
| Lecturing, slide presentation and Exercises |
| **Assessment methods** |
| Monthly exams and quizzes, participation in class and others. |
| **C. Thinking Skills**  1. Questions through the class.  2. Quizzes and exams.  3. Critical thinking skills  4. Team works. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 11. Course Structure | | | | | |
| **Assessment Method** | **Teaching**  **Method** | **Unit/Module or Topic Title** | **ILOs** | **Hours** | **Week** |
| Direct questions | Lecturing, Discussions & Exercises | Evolution of Electric Power Systems |  | 4 | 1 |
| Direct questions | Lecturing, Discussions & Exercises | Components of Electric Power Systems |  | 4 | 2 |
| Direct questions& Exam | Lecturing, Discussions & Exercises | Power System Representation |  | 4 | 3 |
| Direct questions | Lecturing, Discussions & Exercises | Per-Unit (p.u.) Representation |  | 4 | 4 |
| Direct questions& Exam | Lecturing, Discussions & Exercises | Changing the Base of Per-Unit Quantities |  | 4 | 5 |
| **Main Exam (1)** | | | | | 6 |
| Direct questions | Lecturing, Discussions & Exercises | Synchronous Generator Construction & Modeling |  | 4 | 7 |
| Direct questions& Exam | Lecturing, Discussions & Exercises | Parallel Operation of AC Generators |  | 4 | 8 |
| Direct questions | Lecturing, Discussions & Exercises | Power System Protection Equipments & Devices |  | 4 | 9 |
| Direct questions& Exam | Lecturing, Discussions & Exercises | Application of Protection on Iraqi Electrical Network |  | 4 | 10 |
| Direct questions | Lecturing, Discussions & Exercises | Fault Analysis, Symmetrical Components |  | 4 | 11 |
| Direct questions& Exam | Lecturing, Discussions & Exercises | Sequence Impedances for Fault Analysis |  | 4 | 12 |
| **Mid-Year Break** | | | | | 13 |
| **Main Exam (2)** | | | | | 14 |
| Direct questions | Lecturing, Discussions & Exercises | Reactors and balanced faults |  | 4 | 15 |
| Direct questions | Lecturing, Discussions & Exercises | Unbalanced Network Faults |  | 4 | 16 |
| Direct questions | Lecturing, Discussions & Exercises | Worked examples |  | 4 | 17 |
| **Main Exam (3)** | | | | | 18 |
| Direct questions | Lecturing, Discussions & Exercises | Power System Stability |  | 4 | 19 |
| Direct questions | Lecturing, Discussions & Exercises | The Swing Equation |  | 4 | 20 |
| Direct questions& Exam | Lecturing, Discussions & Exercises | Power Angle Relationship |  | 4 | 21 |
| Direct questions | Lecturing, Discussions & Exercises | Equal area relationship |  | 4 | 22 |
| **Main Exam (4)** | | | | | 23 |
| Direct questions | Lecturing, Discussions & Exercises | Power Flow Study, Formulation of the [Y] Matrix |  | 4 | 24 |
| Direct questions | Lecturing, Discussions & Exercises | Gauss Iteration Method and Gauss-Seidal Method |  | 4 | 25 |
| Direct questions& Exam | Lecturing, Discussions & Exercises | Newton-Raphson method |  | 4 | 26 |
| Direct questions | Lecturing, Discussions & Exercises | Worked examples |  | 4 | 27 |
| **Final Exam** | | | | | 28 |

|  |  |
| --- | --- |
| 12. Infrastructure | |
| 1. **Electric Power System**, B.M.Weedy, 1977 by John Wiley. 2. **Power System Analysis**, John J. Grainger & William D. Stevenson, 1994 by McGraw-Hill. 3. **Generation of Electrical Energy**, B.R.Gupta , 1988. 4. **Power System Analysis and Design**, J.Duncan Glover & Mulukutla S. Sarma, 2002 by Brooks/Cole. 5. **Power System Stability and Control**, P.Kundur, 1994. | Required reading:  · CORE TEXTS  · COURSE MATERIALS  · OTHER |
| Internet links related to the topics discussed in the book and class, and some video | Special requirements (include for example workshops, periodicals, IT software, websites) |
| None | Community-based facilities  (include for example, guest  Lectures , internship , field studies) |

|  |  |
| --- | --- |
| 13. Admissions | |
| ---------- | Pre-requisites |
| 25 | Minimum number of students |
| 40 | Maximum number of students |