*Republic of Iraq*

*Ministry of Higher Education & Scientific Research Supervision and Scientific Evaluation Directorate Quality Assurance and Academic Accreditation International Accreditation Dept.*

Academic Program Specification Form for The Academic

*University: Diyala*

*College: Engineering*

*Number Of Departments in The College: 01*

*Date Of Form Completion :17/9/2023*

Prof. Dr. Anees A. Khadom

The Dean

Date :17/9/2023

Signature

Assist. prof. Dr. Jabbar Q. Jabbar

Dean ’s Assistant for Scientific Affairs

Date :17/9/2023 Signature

Assist. prof. Dr. Salah N Farhan

The College Quality Assurance and University Performance Manager

Date :17/9/2023 Signature

Quality Assurance And University Performance Manager Date : / /

Signature

# TEMPLATE FOR PROGRAMME SPECIFICATION

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**PROGRAMME SPECIFICATION**

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| This Program Specification provides a concise summary of the main features of the program 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 is supported by a specification for each course that contributes to the program. |

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| 1. Teaching Institution | University of Diyala |
| 2. University Department/Centre | College of Engineering |
| 3. Program Title | Electrical power Generation |
| 4. Title of Final Award | BSc in Computer Engineering |
| 5. Modes of Attendance offered | Courses |
| 6. Accreditation | N/A |
| 7. Other external influences | None |
| 8. Date of production/revision of this specification | 17/09/2023 |
| 9. Aims of the Program | |
| * Preparing the student scientifically to work in the field of Electrical power Generation | |
| * Build and prepare the student psychologically to play his role as a reliable engineer in this field. | |
| * Building students capable of competing with other engineers for job opportunities and obtaining the required seats to complete postgraduate studies. | |
| * Ability to submit to external tests by local, regional or international bodies for the purpose of completing studies or appointment. | |
| * Urging the student to be creative and think about specialization projects and keep pace with developments in this field. | |
| * Providing students with scientific, practical and personal skills that enable them to solve practical problems and deal with them using scientific concepts. | |

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| 10. Learning Outcomes, Teaching, Learning and Assessment Methods |
| A. Cognitive goals A1- Teaching the student the principles of how the Generations work and how to deal with Generations design  A2- Enabling students to obtain knowledge and understanding in working on and designing electrical generation.  A3- Teaching the student the methods of forming the Generations parts and connected its.  A4- Enabling students to obtain knowledge and understanding of designing everything related to electrical power generation.  A5- Enabling students to obtain knowledge and understanding of diagnosing faults and maintaining various Generation devices.  A6- Teaching the student the foundations of solving programming problems, computer networks, and communications. |
| B. The skills goals special to the program.  B1 - Explanation of generation principles topics by specialists in the subject, with an emphasis on the use of mathematics as a basis for understanding and learning.  B2 - Providing them with skills to solve practical problems related to various load systems |
| Teaching and Learning Methods |
| * Providing students with the basics and additional topics related to previous educational outcomes and skills to solve practical problems. * Solving a group of practical examples by the academic staff. * Students participate during the lecture in solving some practical problems. * The department’s scientific laboratories are monitored by the academic staff. |
| Assessment methods |
| * Daily exams with practical and scientific questions. * Participation marks for difficult competition questions among students. * Assigning grades to homework assignments and reports assigned to them. * Monthly exams for the curriculum in addition to the final exam. |
| C. Affective and value goals  C1- Enabling students to think and analyze topics related to the engineering framework, such as various logical circuits.  C2- Enabling students to think and analyze topics related to Genrations systems related to the engineering framework.  C3- Enabling students to think and analyze topics related to solving practical problems. |
| Teaching and Learning Methods |
| * Providing students with the basics, additional topics, and field experiences related to the outcomes of thinking and analysis. * Forming discussion circles during or outside lectures to discuss scientific engineering topics that require thinking and analysis. * Asking students, a set of thinking questions during lectures, such as (what, how, when, why) for specific topics. * Giving students homework and periodic reports. |
| Assessment methods |
| * Daily exams with practical and scientific questions. * Participation marks for difficult competition questions among students. * Assigning grades to homework assignments and reports assigned to them. * Semester exams for the curriculum in addition to the final exam. |

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| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1- Enabling students to write reports and notes on various branches of computer engineering.  D2- Enabling students to know how to use the Internet to obtain important information.  D3- Raising the student’s self-confidence by linking theoretical material to practical reality.  D4- Developing students’ skills in how to deal with computer hardware and software problems and how to deal with them. | | | | |
| Teaching and Learning Methods | | | | |
| * Through the Daily lectures by seminar and discussions * discussion circles during lectures to discuss scientific engineering topics that require thinking and analysis. * Asking students, a set of thinking questions during lectures, such as (what, how, when, why) for specific topics | | | | |
| Assessment Methods | | | | |
| * Evaluating the seminar and reports that submitted by students and providing them with the necessary feedback to improve their skills and self confidence | | | | |
| 11. Program Structure | | | | 12. Awards and Credits |
| Level/Year | Course or Module  Code | Course or Module Title | Credit rating |
| 1st Year-1st Semester | U 101 | Human Rights and Democracy | **2** | Bachelor Degree Requires ( 143 ) credits |
| 1st Year-1st Semester | CPE 101 | Engineering Drawing Using Computer | **1** |
| 1st Year-1st Semester | E 103 | Physics | **2** |  |
| 1st Year-1st Semester | E 106 | Workshop Skills I | **1** |
| 1st Year-1st Semester | E 101 | Mathematics I | **2** |
| 1st Year-1st Semester | CPE 102 | Programming and Problem Solving Using C++ I | **3** |
| 1st Year-1st Semester | CPE 104 | Fundamentals of Logic Systems | **2** |  |
| 1st Year-1st Semester | CPE 106 | Electrical Circuits I | **3** |  |
| 1st Year-2nd Semester | U 102 | Computer Science | **2** |  |
| 1st Year-2nd Semester | U 103 | English Language | **1** |  |
| 1st Year-2nd Semester | U 104 | Arabic Language | **1** |  |
| 1st Year-2nd Semester | E 107 | Workshop Skills II | **1** |  |
| 1st Year-2nd Semester | E 102 | Mathematics II | **2** |  |
| 1st Year-2nd Semester | CPE 102 | Programming and Problem Solving Using C++ II | **3** |  |
| 1st Year-2nd Semester | CPE 105 | Digital Logic Circuits I | **3** |  |
| 1st Year-2nd Semester | CPE 107 | Electrical Circuits II | **3** |  |
| 2nd Year-1st Semester | E 201 | Applied Mathematics I | **3** |  |
| 2nd Year-1st Semester | CPE 201 | Computer Architecture I | **2** |  |
| 2nd Year-1st Semester | CPE 203 | Electronics | **3** |  |
| 2nd Year-1st Semester | CPE 205 | Digital Logic Circuits II | **4** |  |
| 2nd Year-1st Semester | CPE 207 | Data Structures and Algorithms | **3** |  |
| 2nd Year-1st Semester | CPE 209 | Operating Systems I | **2** |  |
| 2nd Year-1st Semester | CPE 211 | Fundamentals of Communications | **3** |  |
| 2nd Year-2nd Semester | E 202 | Applied Mathematics II | **3** |  |
| 2nd Year-2nd Semester | CPE 202 | Computer Architecture II | **2** |  |
| 2nd Year-2nd Semester | CPE 204 | VLSI Circuit and Design | **3** |  |
| 2nd Year-2nd Semester | CPE 206 | Microprocessor Programming | **3** |  |
| 2nd Year-2nd Semester | CPE 208 | Database Systems | **3** |  |
| 2nd Year-2nd Semester | CPE 210 | Software Engineering | **3** |  |
| 2nd Year-2nd Semester | CPE 212 | Object Oriented Programming using Java | **3** |  |
| 3rd Year-1st Semester | CPE 301 | Engineering Analysis | **3** |  |
| 3rd Year-1st Semester | CPE 303 | Digital Signal Processing I | **3** |  |
| 3rd Year-1st Semester | CPE 305 | Digital System Design I | **3** |  |
| 3rd Year-1st Semester | CPE 307 | Digital Communications | **3** |  |
| 3rd Year-1st Semester | CPE 309 | Control Theory | **3** |  |
| 3rd Year-1st Semester | CPE 311 | Operating Systems II | **3** |  |
| 3rd Year-1st Semester | CPE 313 | Internet Web Site Design | **3** |  |
| 3rd Year-2nd Semester | CPE 302 | Numerical Analysis | **3** |  |
| 3rd Year-2nd Semester | CPE 304 | Digital Signal Processing II | **3** |  |
| 3rd Year-2nd Semester | CPE 306 | Digital System Design II | **3** |  |
| 3rd Year-2nd Semester | CPE 308 | Computer Networks I | **3** |  |
| 3rd Year-2nd Semester | CPE 310 | Computer Control | **3** |  |
| 3rd Year-2nd Semester | CPE 312 | Computer Interfacing | **3** |  |
| 3rd Year-2nd Semester | CPE 314 | Digital Image Processing | **3** |  |
| Fourth Year-1st Semester | E 402 | Graduation Project | **Continued** |  |
| Fourth Year-1st Semester | E 401 | Engineering Profession Ethics | **2** |  |
| Fourth Year-1st Semester | CPE 401 | Computer Vision | **2** |  |
| Fourth Year-1st Semester | CPE 403 | Cryptography and Network Security I | **4** |  |
| Fourth Year-1st Semester | CPE 405 | GNSS Applications | **3** |  |
| Fourth Year-1st Semester | CPE 407 | Computer Networks II | **3** |  |
| Fourth Year-2nd Semester | E 402 | Graduation Project | **2** |  |
| Fourth Year-2nd Semester | E 404 | Engineering Economy | **2** |  |
| Fourth Year-2nd Semester | CPE 402 | Soft Computing | **2** |  |
| Fourth Year-2nd Semester | CPE 404 | Cryptography and Network Security II | **4** |  |
| Fourth Year-2nd Semester | CPE 406 | Embedded Systems | **3** |  |
| Fourth Year-2nd Semester | CPE 408 | Data Compression | **2** |  |

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| 13. Personal Development Planning |
| It is planned to develop the students’ personalities by holding discussion circles with them and asking them for periodic reports and seminars throughout the four stages and on various topics to develop their personal development. |
| 14. Admission criteria . |
| According to the rules and regulations of Ministry of Higher Education and Scientific Research. |
| 15. Key sources of information about the program |
| * College website. * The department’s website and contact the department by email. |

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| **Curriculum Skills Map** | | | | | | | | | | | | | | | | | | | |
| **please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed** | | | | | | | | | | | | | | | | | | | |
|  | | | | **Programmer Learning Outcomes** | | | | | | | | | | | | | | | |
| Year / Level | Course Code | Course Title | Core (C)  Title or Option (O**)** | Knowledge and understanding | | | | Subject-specific skills | | | | Thinking Skills | | | | General and Transferable Skills (or) Other skills relevant to employability and personal development | | | |
| **A1** | **A2** | **A3** | **A4** | **B1** | **B2** | **B3** | **B4** | **C1** | **C2** | **C3** | **C4** | **D1** | **D2** | **D3** | **D4** |
| 3st Year-1st Semester | **EP313** | **Electrical power generation** | C |  | √ | √ |  | √ | √ | √ |  |  | √ | √ |  |  |  |  | √ |
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# TEMPLATE FOR COURSE SPECIFICATION

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**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 programmer specification. |

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| 1. Teaching Institution | University of Diyala |
| 2. University Department/Centre | College of Engineering |
| 3. Course title/code | EP313/ Electrical power generation |
| 4. Modes of Attendance offered | Class Lectures |
| 5. Semester/Year | 1st Semester – 3st Year |
| 6. Number of hours tuition (total) | 30 hours |
| 7. Date of production/revision of this specification | 17/09/2023 |
| 8. Aims of the Course | |
| The Electrical power generation curriculum aims to introduce the student to the skills of Generations types, the basics of Energy Resources, and the way Operation Factors and their types. | |
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| 9· Learning Outcomes, Teaching ,Learning and Assessment Method |

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| A- Cognitive goals .  A1- During the school year, the student learns the basics of Electrical power generation.  A2- Understanding the basics of Energy Resources.  A3- Learn how to think about how plants work and its applications. |
| B. The skills goals special to the course.  B1 - Learn how to deal with plants and applications of plants.  B3- Familiarity with the basic concepts of the types of plants and types of loads with economic calculations. |
| Teaching and Learning Methods |
| * The lecturer prepares lectures on the subject in paper and electronic form and presents them to the students. * The lecturer delivers lectures in detail. * The lecturer requests periodic reports and homework assignments on the basic topics of the subject. |
| Assessment methods |
| * Daily discussion to determine the extent of students’ understanding of the material and to evaluate the daily contributions. * Daily exams with various short scientific questions to understand the extent of their understanding of the material. * Giving part of the semester’s grade to homework assignments. * Daily exams (Quiz) and monthly exams for the curriculum and the final exam |
| C. Affective and value goals  C2- Urging the student to understand the operation of each function or code within the filed.  C3- Urging the student to think about how to develop him in the field of generation’s plants. |
| Teaching and Learning Methods |
| * Providing students with the basics, additional topics, and field experiences related to the outcomes of thinking and analysis. * Forming discussion circles during or outside lectures to discuss scientific engineering topics that require thinking and analysis. * Asking students, a set of thinking questions during lectures, such as (what, how, when, why) for specific topics. |
| Assessment methods |
| * Daily exams with practical and scientific questions. * Participation marks for difficult competition questions among students. * Assigning grades to homework assignments and reports assigned to them. * Semester exams for the curriculum in addition to the final exam. |

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| D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)  D3- Raising the student’s self-confidence by linking theoretical material to practical reality. |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching Method | Assessment Method |
| Week 1 to Week 2 | 4 | The student learns an introduction to the background, Main Energy Resources | Introduction, general background, Main Energy Resources, | Lectures Notes  PDF  power point  Video | Daily exams + monthly exams |
| Week 3 to Week 4 | 4 | The student learns the Elements of power system Generation | Elements of power system Generation, | Lectures Notes  PDF  power point  Video | Daily exams + monthly exams |
| Week 5 to Week 7 | 6 | Learn the details of thermal plants  Hydro plants | thermal plants  Hydro plants | Lectures Notes  PDF  power point  Video | Daily exams + monthly exams |
| Week 8 | 2 | Learn students the details of Steam plants | Steam plants | Lectures Notes  PDF  power point  Video | Daily exams + monthly exams |
| Week 9 | 2 | Learn the details of Nuclear plants | Nuclear plants | Lectures Notes  PDF  power point  Video | Daily exams + monthly exams |
| Week 10 to Week 11 | 4 | Learn students the Operation Factors | Operation Factors: Load factor, capacity factor, Plant use factor, Diversity Factor, … etc | Lectures Notes  PDF  power point  Video | Daily exams + monthly exams |
| Week 12 to Week 13 | 4 | students the Combined Cycles Selection Considerations of Combined Cycles and Cogeneration Plants | Combined Cycles, Selection Considerations of Combined Cycles and Cogeneration Plants, | Lectures Notes  PDF  power point  Video | Daily exams + monthly exams |
| Week 14 | 2 | Explain Applications of Cogeneration and Combined-Cycle Plants, Cogeneration Application Considerations | Applications of Cogeneration and Combined-Cycle Plants, Cogeneration Application Considerations | Lectures Notes  PDF  power point  Video | Daily exams + monthly exams |
| Week 15 | 2 | Learning Economic and Technical Considerations | Economic and Technical Considerations for Combined-Cycle Performance Enhancement Options. | Lectures Notes  PDF  power point  Video | Daily exams + monthly exams |

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| 11. Infrastructure | | |
| 1. Books Required reading: | | power system principles |
| 2. Main references (sources) | | • Lectures presented by the Lecturer  • Books available in the college library |
| A- Recommended books and references (scientific journals, reports…). | | . |
| B-Electronic references, Internet sites… | | Any other materials available on the web. |
| 12. The development of the curriculum plan | |
| The Development of the curriculum consists of various practical examples of using diodes in daily used devices and gadgets | |
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