جامعة الإسراء
ISRA UNIVERSITY

# Course Syllabus

***According to JORDAN National Qualification Framework (JNQF)***

# Course Name: Energy Production Technology

# Course Number: 04085271

## General Course Information:

| | |
|---|---|
| Course title | Energy Production Technology |
| Course number | 04085271 |
| Credit hours | 3h (theory) |
| Education type | Face-to-Face |
| Prerequisites/corequisites | 408491 Energy conversion and storage |
| Academic Program | Renewable Energy Engineering |
| Program code | REE |
| Faculty | Engineering |
| Department | Renewable Energy Engineering Department |
| Level of course | Fourth-year |
| Academic year /semester | 2022/2023 First Semester |
| Awarded qualification | B.Sc. |
| Other department(s) involved in teaching the course | None |
| Language of instruction | English & Arabic |
| Date of production/revision | 2022/2023 |

## Course Coordinator:

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|---|---|
| Coordinator'sname | Dr.Nour Khlaifat |
| Office No | 3rd floor, 4348 |
| Office Phone extension number | |
| Office Hours | (Sunday, Tuesday, Thursday): 10:00-12:00 |
| Email | noor.alkhlaifat@iu.edu.jo |

## Other Instructors:

| | |
|---|---|
| Instructorname | - |
| Office No | |
| Office Phone extension number | |
| Office Hours | |
| Email | |

## Course Description*(English/Arabic)*:

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|---|---|
| **English** | The course aims to give students basic knowledge of central energy production technologies. This includes how the systems function, how they can be evaluated quantitatively, what they cost, and their benefits for or effects on the natural environment. The course will deal with fossil fuel-based power plants, including coal power plants and natural gas power plants. Also, this course will cover renewable power plants, including; wind, solar, hydro, biomass, andgeothermal. |
| **Arabic** | |

**Textbook:** ***Author(s), Title, Publisher, Edition, Year, Book website.***

Paul Breeze, Power Generation Technologies, 2nd,2014.
https://www.elsevier.com/books/power-generation-technologies/breeze/978-0-08-098330-1

**References:** ***Author(s), Title, Publisher, Edition, Year, Book website.***

1.Imene Yahyaoui – Advances in Renewable Energies and Power Technologies– Volume 1: Solar and Wind Energies, Elsevier Inc., (2018), ISBN: 978-0-12-812959-3

2Power Plant Engineering, Larry Drbal, Kayla Westra, Pat Boston, 1995, Springer US, ISBN: 978-1-4613-0427-2

## Course Educational Objectives (CEOs):

| | |
|---|---|
| **1.** | To cover the general working principle for the different power production technologies. |
| **2.** | To present the component of each power plant system. |
| **3.** | To develop an intuitive understanding of the subject matter by emphasizing the environmental issues related to power production. |
| **4.** | Increasing interest in reducing emissions and pollutants from conventional power plants using modern technological methods |
| **5.** | |

## IntendedLearning Outcomes (ILO's):

| a. | Subject Intended learning outcomes (ILOs) describe what students are expected to know and be able to do at the end of the course. These outcomes are related to the knowledge, skill and competence that students acquire: | **Relationship to CEOs** | **Contribution to PLOs** | **Bloom Taxonomy Levels*** | **Descriptors**** |
|---|---|---|---|---|---|
| b. A | Knowledge and Understanding: | | | | |
| c. A1 | Identify the different power productiontechnologies, including power plants and their components. | 1+2 | 1+2+4 | 1 | K |
| d. A2 | Identify the conventional and renewable energy production technologies. | 1+2 | 1+2+4 | 4 | S |
| e. A3 | Describe the different approaches and systems for energy production for each technology. | 1+2+3 | 1+2+4 | 5 | C |
| f. B | Intellectual skills: | | | | |
| g. B1 | Understand the environmental issues related to generating | 3+4 | 1+2+3 | 2 | S |

| | | | | | |
|---|---|---|---|---|---|
| | electricity from conventional resources and how to reduce the effect of these issues. | | | | |
| h. C | Subject specific skills: | | | | |
| i. C1 | Understand and be aware of the importance of issues such as energy efficiency, minimizing environmental impact, security of supply. | 1+2+3+4 | 1+2+3 | 3 | K |
| j. C2 | Be aware of the consequences for the secure and strategic supply of the different energy alternatives. | 1+2+3+4 | 1+2+4 | 6 | C |
| k. D | Transferable skills: | | | | |
| l. D1 | Be familiar with all transformations that energy goes through from its state as an "energy source" until usage as an "energy service | 1+2+3+4 | 1+2+3 | 5 | S |

***Bloom Taxonomy Levels**

| Level# | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Level Name | Knowledge | Comprehension | Application | Analysis | Evaluation | Synthesis |

**** Descriptor (National Qualification Framework Descriptors): K : Knowledge, S: Skill, C: Competency.**

## Program Learning Outcome (PLOs):

| Program Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviours that students acquire as they progress through the program. A graduate of the (_____) program will demonstrate: | Descriptors** | | |
|---|---|---|---|
| | K | S | C |

| | | | | |
|---|---|---|---|---|
| **1.** | An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. | | | |
| **2.** | An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. | | | |
| **3.** | An ability to communicate effectively with a range of audiences. | | | |
| **4.** | An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts. | | | |
| **5.** | An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives | | | |
| **6.** | An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions | | | |
| **7.** | An ability to acquire and apply new knowledge as needed, using appropriate learning strategies | | | |
| **8.** | | | | |
| **9.** | | | | |
| **10.** | | | | |
| **11.** | | | | |

**** Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)**

## Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:
Interactive videos
Practice Labs
Discussion Forums
Quizzes
Other Interactive online activities
Integrative Projects
Reports

## Course Policies:

A- Attendance policies:

The maximum allowed absences is 15% of the lectures.

B- Absences fromexams andhandingin assignmentson time:

Midterm exam can be retaken based on approval of excuse by the instructor's discretion.

Not handing assignment on time will incur penalties.

C- Academic Health and safetyprocedures

D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

Cheating, plagiarism, misbehaviourwill result in zero grade and further disciplinary actions may be taken.

E- Grading policy:

- All homework isto be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Activities (Course Videos, Practice labs, Discussion Forums, Quizzes)_**20__%**
- Midterm_**30__%**
- Final Exam **__50_%**

F- Available university services that support achievement in the course:**E-Learning Platform, Labs, Library.**

## Required equipment:

- **PC / Laptop with webcam and mic**
- **Internet Connection**
- **Access to the IU E-Learning Platform at: https://elearn.iu.edu.jo/**
- **E-learning plan**
- Satisfaction questionnaires for online and face-to-face learning
- Software for e-learning
- Training

## Assessment Toolsimplemented in the course:

- Final Exam
- Midterm Exam
- Quizzes
- Homework
- Practice Labs
- Discussion Forums
- Periodic reports for learning assessment
- Improvement plans for online or face-to-face teaching
- Others:…….

## Responsible Persons and their Signatures:

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|---|---|---|---|
| **Course Coordinator** | **Dr.Nour khlaifat** | **Completed Date** | **13/ 10 /2022** |
| | | **Signature** | |

| | | | |
|---|---|---|---|
| **Received by** (Department Head) | | **Received Date** | / / |
| | | **Signature** | |