هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification

Course Title:	**Environmental Physics**
Course Code:	**ENW21٥**
Program:	**Environmental Protection Technology**
Department:	**--**
College:	**Applied College-Al- Aarda**
Institution:	**Jazan University, Jazan**
Version:	**1st**
Last Revision Date:	**03\06\2024**

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A. General information about the course:

1. Course Identification

1. Credit hours: (2)

2. Course type

A.	☐University	■ College	■ Program	☐Track	☐Others
B.	■Required		☐Elective		

3. Level/year at which this course is offered: (Level 3/ Year 2)

4. Course general Description:

This course covers the main themes that underpin the environmental physical processes and issues that are to be examined. This course explores the physical principles that underlie the energy exchanges that relate to human beings in cold and hot local environments. It will be subsequently seen that these principles link with a wide variety of environmental phenomena. We discuss how to examine the application of physics, especially energy transfers, to the improvement of the design and operation of buildings. The course reviews various features of life in the urban environment. Rising environmental consciousness is inducing governments world-wide to move slowly towards the idea of sustainable cities, in which a major priority is the improvement of human health and the quality of life.

5. Pre-requirements for this course (if any)**:**

113ENW-2

6. Co-requisites for this course (if any)**:NONE**

7. Course Main Objective(s):

Upon completion of the course, it is expected that the student will have acquired familiarity with the following concepts:

- What is environmental physics?

- Human environment.

- Built environment.

- Urban environment.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100%
2	E-learning	---	---

No	Mode of Instruction	Contact Hours	Percentage
3	Hybrid • Traditional classroom • E-learning		---
4	Distance learning	---	---

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	---
3.	**Field**	---
4.	**Tutorial**	---
5.	**Others (specify)**	---
Total		30

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Define various concepts & theories related to the processes and issues of environmental physics.	**K1**	Lecture, discussion in class	**Direct:** Quiz and mid-term & final Exams. **Indirect:** student survey
1.2	Identify Physics contribution in the environment (Human environment- Built environment- Urban environment - Global environment – Biological environment),etc	**K.2**	Lecture, discussion in class	**Direct**: Quiz and mid-term & final Exams. **Indirect:** student survey
1.3	Understand the general laws and topics related to various	**K3**	Lecture, discussion in class	**Direct:** Quiz and mid-term & final Exams. **Indirect:** student survey

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
	thermodynamic processes, work & heat in thermodynamic cycles, system enthalpy, entropy, and efficiency of heat engines as well other systems.			
2.0	**Skills**			
2.1	Solve problems related to various thermodynamic processes, work & heat in thermodynamic cycles, system enthalpy, entropy, and efficiency of heat engines as well other systems.	**S1**	Lecture, discussion in class	**Direct**: Quiz and mid-term & final Exams. **Indirect:** student survey
2.2	Evaluate Physics contributions in the environment .	**S.2**	Lecture, discussion in class	**Direct:** Quiz and mid-term & final Exams. **Indirect:** student survey
2.3				
3.0	**Values, autonomy, and responsibility**			
3.1	work effectively as part of a team in the group assignment.	**V1**	Lecture, discussion in class	**Direct:** Quiz and mid-term & final Exams. **Indirect:** student survey
3.2	Demonstrate professional attitude, ethical behavior, integrity, social and culture awareness, and proper judgment on right time.	**V2**	Lecture, discussion in class	**Direct:** Quiz and mid-term & final Exams. **Indirect:** student survey

C. Course Content

No	List of Topics	Contact Hours
1.	**Environmental physics: processes and issues:** The environment: the science of the twenty-first century?, Environmental concerns in the late twentieth Century, What is environmental physics?, Physics in the environment (Human environment – Built environment- Urban environment - Global environment - Biological environment).	6
2.	**The human environment:** Laws of Thermodynamics , First Law of Thermodynamics, Second Law of Thermodynamics, Entropy and the Third Law of Thermodynamics, Laws of Thermodynamics and the human body, Energy and metabolism, Thermodynamics and the human body, First Law of Thermodynamics and the human body. Second Law of Thermodynamics and the Gibbs free energy, Energy transfer (Conduction, Convection, Radiation) , Evaporation, Energy budget equation, Survival in the cold, Thermal comfort and insulation, Boundary layer, Wind chill, Hypothermia, Survival in hot climates, Effect of heat on the human body, Taking risks, weather and survival.	8
3.	**The built environment:** Thermal regulation in buildings, Thermal insulation, Thermal conduction effects. Convection effects, Radiation effects, U-values, Energy use in buildings, Efficiency, Energy losses, Calculation of energy losses, Energy gains, Air regulation in buildings, Ventilation requirements, Ventilation installations, Heat pumps, Heat pump efficiency, Condensation, Water vapour, Humidity, Condensation in buildings, and Buildings of the future.	8
4.	**The urban environment:** Townscape, Energy in the city, Electromagnetic induction, Electrical power transmission, Transportation, Energy efficiency in transport, Water for the urban environment, Sewage, Lighting, Sources of light, Urban pollution, Urban pollutants, Particulates, Smog, Acid rain, The car as an urban pollutant, Internal combustion engine, Efficiency of the car engine, Reducing vehicle emissions, Noise pollution, Human ear, Sound levels, and Hearing los.	8
Total		**30**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework’s	Continuous	10 (10%)

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
2.	Student Class Activity	Continuous	5(5%)
3.	Quiz	Continuous	5(5%)
4.	Midterm exam 1	9-10	15(15%)
5.	Quiz 2	Continuous	5(5%)
	Final Exam	16-18	60(60%)
Total			**100%**

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Nigel Mason, Peter Hughes, et. al., Introduction to Environmental Physics, by Taylor & Francis Group, LLC • London and New York 2001.
Supportive References	- Kyle Forinash, Foundations of Environmental Physics, Island Press, Washington, Covelo, London, 2010. - John L. Monteith and Mike H. Unsworth, Principles of • Environmental Physics, 4th edition, ELSEVIER 2013.
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**A classroom for a group of 50 students equipped with LCD projector, smart board and/or classical board.**
Technology equipment (projector, smart board, software)	
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students, Peer and program leader	Indirect (Course Evaluation Survey) - Indirect peer evaluation
Effectiveness of Students' assessment	Students, Program assessment committee	Direct/ Indirect
Quality of learning resources	Students, Faculty members	Direct/ Indirect
The extent to which CLOs have been achieved	Faculty members	Indirect
Other	---	---

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**BOARD OF DEPARTMENT**
REFERENCE NO.	
DATE	**03\06\2024**