

**TISHK INTERNATIONAL UNIVERSITY**  
**FACULTY OF EDUCATION**  
**Department of PHYSICS EDUCATION,**  
**2022-2023 Spring**  
**Course Information for EDU 412 MATERIAL ADAPTATION AND DEVELOPMENT**

<b>Course Name:</b> MATERIAL ADAPTATION AND DEVELOPMENT					
<b>Code</b>	<b>Regular Semester</b>	<b>Theoretical</b>	<b>Practical</b>	<b>Credits</b>	<b>ECTS</b>
EDU 412	8	3	-	3	4
<b>Name of Lecturer(s):</b> Sivar Aziz					
<b>Teaching Assistant:</b> -					
<b>Course Language:</b> -					
<b>Course Type:</b> Main					
<b>Office Hours:</b> Tuesday 9:00 - 11.00					
<b>Contact Email:</b> sivar.aziz@tiu.edu.iq					
Tel:07502008387					
<b>Teacher's academic profile:</b> MSc.in Material Science (Shape Memory Alloy)					
<b>Course Objectives:</b> This course introduces students how materials are developed, evaluated and used in physics teaching. It will help students to better understand the theoretical assumptions behind materials, the role of materials in physics teaching and the methods of materials development and evaluation. Students will be asked to develop and evaluate sample materials, adapt materials for classroom use and present their work in the class. Practical assignments will provide opportunities for application of the concepts and practices by requiring students to analyze physics teaching materials currently in use.					
<b>Course Description (Course overview):</b> This course introduces students to the objectives of how materials are developed, evaluated and used in physics teaching. It will help students to better understand the theoretical assumptions behind materials, the roles of materials in physics teaching and the methods of materials development and evaluation. Students will be asked to develop and evaluate sample materials, adapt materials for classroom use and present their work in the class. Practical assignments will provide opportunities for application of the concepts and practices by requiring students to analyze physics teaching materials.					

**COURSE CONTENT**

Week	Hour	Date	Topic
1	3	29/1-2/2/2023	Registration to the courses
2	3	5-9/2/2023	Introduction: Why do we need teaching materials for physics classes?
3	3	12-16/2/2023	Common teaching materials and their properties with examples from physics teaching.
4	3	19-23/2/2023	Teaching Materials Principles with examples from physics teaching.
5	3	26/2-2/3/2023	Physics material development with computer technology(how to create teaching material with ppt animation)
6	3	5-9/3/2023	Conceptual Review of Physics and Science Books
7	3	12-16/3/2023	Preparing written materials in physics
8	3	19-23/3/2023	projects
9	3	26-30/3/2023	Material development to teach pressure
10	3	2-6/4/2023	Midterm Exam
11	3	9-13/4/2023	Material development to teach circular motion
12	3	16-20/4/2023	Material development to teach heat and thermodynamics
13	3	23-27/4/2023	Material development to teach sound
14	3	30/4-4/5/2023	Material development to teach electric circuits
15	3	7-11/5/2023	Review week
16	3	14-18/5/2023	Review week
17	3	21-25/5/2023	Final Exam
18	3	28/5-1/6/2023	Final Exam
19	3	4-8/6/2023	Final Exam

**COURSE/STUDENT LEARNING OUTCOMES**

- 1 Expose the learners physics in authentic use
- 2 Help learners to pay attention to the features of authentic input
- 3 Provide the learners with opportunities to use the target physics topics to achieve communicative purposes
- 4 Know how to prepare paper based teaching materials for physics
- 5 Know how to prepare digital materials for teaching physics

**COURSE'S CONTRIBUTION TO PROGRAM OUTCOMES**  
(Blank : no contribution, I: Introduction, P: Profecient, A: Advanced )

<b>Program Learning Outcomes</b>		<b>Cont.</b>
<b>1</b>	Discuss concepts and principles of physics.	A
<b>2</b>	Conduct proper experiments safely and interpret the data in physics teaching physics.	A
<b>3</b>	Use the results of recent education and subject-specific developmental research when designing, implementing and justifying their own practice as a teacher.	A
<b>4</b>	Apply analytical and theoretical skills to model and solve physics problems.	P
<b>5</b>	Identify students' misconceptions and deal with them in classroom.	A
<b>6</b>	Prepare physics lessons with appropriate learning materials and teaching methods.	A
<b>7</b>	Effectively assess, plan, teach, organize, and manage physics classrooms.	P
<b>8</b>	Use appropriate methods and techniques to improve students' critical thinking, creative thinking and problem-solving skills in physics.	A
<b>9</b>	Use required modern methods and techniques for student-centered teaching by considering individual and cultural differences of students.	A
<b>10</b>	Effectively use a variety of teaching technologies and techniques and classroom strategies to foster student learning.	A
<b>11</b>	Communicate effectively and work collaboratively within the context of a global society.	I
<b>12</b>	Exhibit character and decision-making skills embodying professionalism and ethical behavior.	P

<b>Prerequisites (Course Reading List and References):</b>	All educational courses and physics courses till to the last semester
<b>Student's obligation (Special Requirements):</b>	Punctuality is important. Doing regular homework on time. Preparing animation. Active classroom participation is requested.
<b>Course Book/Textbook:</b>	Handouts, documents prepared by the lecturer Secondary and High school physics books used in governmental schools
<b>Other Course Materials/References:</b>	Material development books. First step in physics I, Semih Aydin, Zambak Publishing First step in physics II, Semih Aydin, Zambak Publishing
<b>Teaching Methods (Forms of Teaching):</b>	Lectures, Practical sessions, Exercises, Presentation, Self evaluation, Project, Assignments, Demonstration, , ,

<b>COURSE EVALUATION CRITERIA</b>		
<b>Method</b>	<b>Quantity</b>	<b>Percentage (%)</b>
Participation	1	5
Quiz	2	5
Homework	1	5
Project	1	10
Midterm Exam	1	20
Presentation	1	10
Final Exam	1	40
<b>Total</b>		<b>100</b>
<b>Examinations:</b> Essay Questions, Fill in the Blanks, Multiple Choices, Short Answers, , ,		

**Extra Notes:**

<b>ECTS (ALLOCATED BASED ON STUDENT) WORKLOAD</b>			
<b>Activities</b>	<b>Quantity</b>	<b>Workload Hours for 1 quantity*</b>	<b>Total Workload</b>
Theoretical Hours	19	3	57
Practical Hours	19	0	0
Final Exam	1	10	10
Participation	1	5	5
Quiz	2	2	4
Homework	1	5	5
Project	1	10	10
Midterm Exam	1	10	10
Presentation	1	10	10
<b>Total Workload</b>			<b>111</b>
<b>ECTS Credit (Total workload/25)</b>			<b>4</b>

**Peer review**

Signature:  
Name:  
Lecturer

Signature:  
Name:  
Head of Department

Signature:  
Name:  
Dean