



**AYDIN ADNAN MENDERES UNIVERSITY**  
**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**  
**MATHEMATICS AND SCIENCE EDUCATION**  
**SCIENCE EDUCATION**  
**SCIENCE EDUCATION MASTER**  
**COURSE INFORMATION FORM**

Course Title	Model-Based Instruction in Science Education								
Course Code	İFB529		Course Level		Second Cycle (Master's Degree)				
ECTS Credit	8	Workload	200 (Hours)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	Modeling is a method that is used very often in science and science education. However it brings disadvantages together because students view science and especially science as body of facts and it is not emphasized that models are simple and concrete prototypes of the real phenomena. Therefore, the aim of this course is to make students to be aware of models and models, to gain knowledge about them and their types, to know the models used in science education and to make new models								
Course Content	Model-based teaching and learning, basic concepts and background of model-based learning, introduction to model-based teaching strategies, models used in science education.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Discussion, Project Based Study, Individual Study								
Name of Lecturer(s)	Lec. Hanife Can ŞEN								

#### Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	25
Final Examination	1	50
Quiz	2	10
Project	1	15

#### Recommended or Required Reading

1	Clement, J. J. & Rea-Ramirez, M. A. (2008). Model-Based Learning and Instruction in Science.
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Week	Weekly Detailed Course Contents	
1	Theoretical	Model Based Learning and Instruction
2	Theoretical	Basic Concepts of Model Based Learning
3	Theoretical	Background for Model Based Learning
4	Theoretical	Model Based Teaching Strategies
5	Theoretical	Model Based Teaching Strategies
6	Theoretical	Model Based Teaching Strategies
7	Theoretical	Model Based Teaching Strategies
8	Intermediate Exam	Midterm is administered.
9	Theoretical	Studies about Model Based Teaching Strategies
10	Theoretical	Studies about Model Based Teaching Strategies
11	Theoretical	Developing Modelling Materials for Elementary Science and Technology Curriculum.
12	Theoretical	Developing Modelling Materials for Elementary Science and Technology Curriculum.
13	Theoretical	Developing Modelling Materials for Elementary Science and Technology Curriculum.
14	Theoretical	Presentation of the Materials Developed
15	Theoretical	Presentation of the Materials Developed, General review of the course
16	Final Exam	Final examination is administered.

#### Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	5	3	112
Term Project	1	25	1	26
Individual Work	14	0	2	28
Quiz	2	7	1	16
Midterm Examination	1	7	1	8



Final Examination	1	9	1	10
Total Workload (Hours)				200
[Total Workload (Hours) / 25*] = ECTS				8
*25 hour workload is accepted as 1 ECTS				

### Learning Outcomes

1	Knows the contribution of modeling in development of science
2	Knows the types of models.
3	Selects the model most appropriate to the topic
4	Follows the teaching strategies studied in science education literature.
5	Develops models and examines other models.

### Programme Outcomes (Science Education Master)

1	To be able to have an expert theoretical knowledge within the field of science education.
2	To be able to transfer expert knowledge gained in science education into various instructional environment.
3	To be able to integrate science education knowledge with the other disciplines and product functional knowledge
4	To be able to use information and communication technologies efficiently in conceptual learning
5	To be able to find scientific solutions to the problems in the field of science education
6	To be able to evaluate the knowledge critically in the field
7	To be able to participate in team projects in the science education field
8	To be able to adopt lifelong learning strategies to his/her studies
9	To be able to use at least one foreign language efficiently in oral and verbal communication
10	To be able to share national and international data in the field of science education
11	To be able to comprehend and evaluate science-technology-society and environment interactions
12	To be able to comprehends science under the ethical values and take account of ethical considerations
13	To be able to use scientific information in the other domains that is gained in the masters field and have the transfer skills
14	To be able to follow the current development in the science education field
15	To be able to develop strategical plans and evaluate them in the context of quality processes

### Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1	L2	L3	L4	L5
P1	1	1	5	2	1
P2	1	1	5	2	3
P3	1	1	5	2	3
P4	1	4	2	2	3
P5	1	4	1	2	2
P6	1	1	5	5	5
P7	1	1	5	2	3
P8	1	4	1	3	2
P9	1	2	5	4	3
P10	1	1	5	5	4
P11	1	1	2	4	3
P12	1	1	2	4	3
P13	1	1	5	3	4
P14	1	1	3	5	4
P15	1	4	2	4	3

