



**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	Science Technology Engineering Mathematics (stem) Education								
Course Code	İFB526		Course Level		Second Cycle (Master's Degree)				
ECTS Credit	8	Workload	200 (Hours)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	This course aims to introduce science, technology, mathematics and engineering (STEM) education research to the students and to help them prepare a research proposal in this subject. In line with this overall objective, the educational research on STEM will be examined in terms of its history, theoretical infrastructure, research methods and results; National approaches in this area will be discussed and research recommendations will be developed								
Course Content	To provide information about the beginning and foundation of the STEM education movement, to help develop a critical perspective on STEM education research, to examine the place of STEM education in the sciences and mathematics program, and to research planning for STEM education								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Discussion, Project Based Study, Individual Study								
Name of Lecturer(s)	Assoc. Prof. Dilek KARIŞAN KORUCU								

#### Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	40
Practice	1	60

#### Recommended or Required Reading

1	Akaygun, S., & Aslan-Tutak, F. (2016). STEM Images Revealing STEM Conceptions of Pre-Service Chemistry and Mathematics Teachers. <i>International Journal of Education in Mathematics, Science and Technology</i> , 4(1), 56-71. Akgündüz, D. & Ertepinar, H. (Editörler) (2015) STEM Eğitimi Türkiye Raporu. İstanbul Aydın Üniversitesi, İstanbul. Altan, E. B., Yamak, H., & Kırıkkaya, E. B. (2016). Hizmetöncesi Öğretmen Eğitiminde FETEMM Eğitimi Uygulamaları: Tasarım Temelli Fen Eğitimi. <i>Trakya Üniversitesi Eğitim Fakültesi Dergisi</i> , 6(2).
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Week	Weekly Detailed Course Contents	
1	Theoretical	What is STEM education and why is it important
2	Theoretical	What STEM education brings to science and mathematics education
3	Theoretical	Learning theories that form the basis of STEM education
4	Theoretical	Teaching methods and techniques used in STEM education
5	Theoretical	STEM education research in national field
6	Theoretical	STEM education researches in international research
7	Theoretical	Research methods and results used in STEM education research
8	Intermediate Exam	mid term
9	Theoretical	Critical review of STEM education research ** Problem situation and research question for STEM education
10	Theoretical	National reports and projects supporting STEM education
11	Theoretical	Examination of science and mathematics curriculum in terms of STEM applications * Literature writing for research on STEM education
12	Theoretical	Ability to develop content suitable for STEM education for science and mathematics courses * Research
13	Theoretical	Share research results for STEM education
14	Theoretical	method planning for STEM education-oriented research Apply research methodology for STEM education research
15	Final Exam	final exam



**Workload Calculation**

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	3	3	84
Assignment	14	2	0	28
Individual Work	14	5	0	70
Midterm Examination	1	8	0	8
Final Examination	1	10	0	10
Total Workload (Hours)				200
[Total Workload (Hours) / 25*] = ECTS				8

\*25 hour workload is accepted as 1 ECTS

**Learning Outcomes**

1	To learn the emergence of STEM education with the academic readings and discussions to be done and the theoretical approaches that form the basis of these researches
2	To develop a critical perspective on field research by examining national and international research conducted in the field of STEM education in terms of theoretical approaches, research methods and results
3	To be able to develop content suitable for STEM education by examining current science and mathematics education curriculum in terms of STEM applications
4	To be able to determine the priorities of this field by following the national and international movements, projects and researches related to STEM education and planning the research in this field.
5	Students become aware of the connection of science with other courses

**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	5	4	5	4	
P2	3	5	4	5	5
P3	4	4	5	4	
P4	3	5	4	5	
P5	5	5	5	4	
P6	3	5	4	5	5
P7	4	3	5	4	
P8	5	3	4	4	
P9	2	3	5	4	5
P10	4	4	5	5	
P11	3	5	5	4	5
P12	2	4	5	5	
P13	5	5	4	5	5
P14	4	4	5	5	
P15	2	5	4	4	

