

İndirilme Tarihi

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İMEAE 402 - MATHEMATICS PHILOSOPHY - Eğitim Fakültesi - Matematik ve Fen Bilimleri Eğitimi Bölümü

General Info

Objectives of the Course

The aim of this course is to explore philosophical problems related to mathematics and to identify and explore the uncertainties underlying the philosophy of mathematics and mathematics.

Course Contents

Ontology and epistemology of mathematics, Numbers, sets, functions, etc. mathematical concepts and meanings of propositions and mathematical expressions. Fundamentals of mathematics, methods and philosophical problems related to the nature of mathematics. Objectivity in mathematics and its applicability to the real world. The work of pioneers of the philosophy of mathematics such as Frege, Russell, Hilbert, Brouwer, and Gödel. Fundamental theories in the philosophy of mathematics: Logicism (Logicism), Formalism (Formalism), Structuralism and Intuitionism (Intuitionism), the work of the pioneers of the philosophy of mathematics such as Frege, Russell, Hilbert, Brouwer, and Gödel

Recommended or Required Reading

Matematik felsefesi, Bekir S. Gür, Kadim Yayınları.
Matematiksel düşünme, Cemal Yıldırım, Remzi Kitabevi. Matematik Tarihi ve Felsefesi, Pegem Akademi. Adnan BAKI.

Planned Learning Activities and Teaching Methods

DISCUSSION AND EXPLANATION METHOD

Recommended Optional Programme Components

The books recommended for this course should be read.

Instructor's Assistants

There are no teaching assistants.

Presentation Of Course

The course will be conducted face to face for 15 weeks.

Dersi Veren Öğretim Elemanları

Dr. Öğr. Üyesi Solmaz Damla Gedik Altun

Program Outcomes

1. Students will be able to explain the place of mathematics among the sciences.
2. Students will be able to explain basic mathematical concepts such as theorem, proof and axiom.
3. Students will be able to explain the objectivity and real-world applicability of mathematics.
4. Students will be able to explain the views of important scientists working in the field of philosophy of mathematics.
5. Students will be able to explain the basic theories in the philosophy of mathematics.

Weekly Contents

Order	PreparationInfo	Laboratory TeachingMethods	Theoretical	Practise
1	In the first week, the definition and scope of philosophy of mathematics will be discussed. Within the scope of this topic, the relationship between mathematics and philosophy and the basic questions of philosophy of mathematics will be discussed. For this, the course notes sent will be read and prepared.	In the first week, the definition and scope of philosophy of mathematics will be explained. Within the scope of this topic, the relationship between mathematics and philosophy and the basic questions of philosophy of mathematics will be discussed with students by explaining them using the narrative method.	DEFINITION AND SCOPE OF PHILOSOPHY OF MATHEMATICS	

Order	PreparationInfo	Laboratory TeachingMethods	Theoretical	Practise
2	In the second week, the historical development of the philosophy of mathematics, the epistemology and ontology of mathematics will be discussed. Within the scope of these topics, the philosophy of mathematics in Ancient Greece and the Middle Ages, a priori knowledge, empiricism and intuitionism will be discussed. For this, the course notes sent will be read and prepared.	In the second week, the historical development of the philosophy of mathematics, the epistemology and ontology of mathematics will be explained using the lecture and discussion method.	HISTORICAL DEVELOPMENT OF PHILOSOPHY OF MATHEMATICS, EPISTEMOLOGY AND ONTOLOGY OF MATHEMATICAL KNOWLEDGE	
3	This week, the ontology of mathematical objects and the foundations of mathematics will be discussed. Within the scope of these topics, platonism, nominalism, antirealism, structuralism, set theory, logicism, and proof concepts will be discussed. Before coming to class, the lecture notes of the 3rd week will be read.	This week, the ontology of mathematical objects and the foundations of mathematics will be explained and discussions will be held on the subject. Basic information will be given through the narrative method.	ONTOLOGY OF MATHEMATICAL OBJECTS AND FOUNDATIONS OF MATHEMATICS	
4	In the FOURTH week, the applicability of mathematics, its role in natural sciences, the incredible effectiveness of mathematics in physics, and the concepts of infinity and continuity will be explained. For this, the course notes sent will be read and prepared.	In the FOURTH week, the applicability of mathematics, its role in natural sciences, the incredible effectiveness of mathematics in physics, and the concepts of infinity and continuity will be explained to students through lecture and discussion.	APPLICABILITY OF MATHEMATICS, CONCEPT OF INFINITY AND CONTINUITY	
5	This week, the relationship between mathematics, mathematical intuitionism and structuralism, and mathematics and logic will be discussed. For this, the course notes sent will be read and prepared.	This week, the subjects of mathematical intuitionism and structuralism, the relationship between mathematics and logic will be explained to students using the lecture and discussion method.	mathematical intuitionism and structuralism, the relationship between mathematics and logic	
6	This week, the topics of Aesthetic Dimension of Mathematics, Mathematical creativity and aesthetics, the relationship between mathematics and art, Mathematics and Language - Mathematical language and symbols will be discussed. Before the lesson, students should read the lecture notes shared with them before the lesson.	This week, the Aesthetic Dimension of Mathematics, Mathematical creativity and aesthetics, the relationship between mathematics and Language - Mathematical language and symbols will be explained to students through explanation and discussion.	The aesthetic dimension of mathematics, Mathematics and Language	
7	This week, the existence of mathematical objects and mathematical thinking processes will be discussed. Students should read the shared lecture notes before the lesson.	This week, the existence of mathematical objects and mathematical thinking processes will be explained to students using the lecture and discussion method.	The existence of objects in mathematics and mathematical thinking processes	
9	This week, all the crises that helped develop mathematics from the classical period to the modern era will be explained in detail. Students are required to read the lecture notes given before the lesson.	This week, all the crises that helped the development of mathematics from the classical period to the modern era will be explained in detail using the lecture and discussion method.	depressions in mathematics	
10	This week, the topics of Limits of Mathematics, Mathematical proof and limits, Unsolvable problems and mathematical uncertainty, Extension and limitation dynamics of Mathematics will be discussed. Before the lesson, students should read the lecture notes given to them before coming to the lesson.	This week, the subjects of Limits of Mathematics, Mathematical proof and its limits, Unsolved problems and mathematical uncertainty, Extension and limitation dynamics of Mathematics will be explained using the lecture and discussion method.	limits of mathematics	

Order	PreparationInfo	Laboratory TeachingMethods	Theoretical	Practise
11	This week, Philosophy of Mathematics Education, Philosophical foundations of teaching mathematics, Teaching mathematical concepts, Ethical and social issues in mathematics education will be explained. The lecture notes given to students before the lesson should be read.	This week, Philosophy of Mathematics Education, Philosophical foundations of teaching Mathematics, Teaching mathematical concepts, Ethical and social issues in Mathematics education will be explained through narration and discussion method.	Philosophy of Mathematics Education	
12	For the philosophical schools that will be discussed this week, pages 295-333 of the History and Philosophy of Mathematics book, chapter 2, will be read.	This week, the lecture method and discussion method will be used for the topic of philosophical schools.	Mathematical philosophical schools	
13	For the critique of philosophical schools, which will be discussed this week, pages 233-350 of the second chapter of the History and Philosophy of Mathematics book will be read.	This week, the topic of criticism of philosophical schools will be explained using the lecture and discussion method.	Critique of Philosophical Schools	
14	For the topic of "conclusions to be derived from the philosophy of mathematics for mathematics education", which will be discussed this week, pages 370-394 of the second chapter of the History and Philosophy of Mathematics book will be read.	This week, the subject of the implications of the philosophy of mathematics for mathematics education will be explained to students through lecture and discussion methods.	Conclusions That Can Be Drawn from Philosophy of Mathematics for Mathematics Education	
15	This week, scientists working in the field of philosophy of mathematics and philosophy of mathematics education will be discussed. The lecture notes given before the course should be read.	This week, scientists working in the field of philosophy of mathematics and philosophy of mathematics education will be introduced to students through lecture and discussion methods.	scientists working in the field of philosophy of mathematics and philosophy of mathematics education	

Workload

Activities	Number	PLEASE SELECT TWO DISTINCT LANGUAGES
Vize	1	1,00
Final	1	1,00
Ders Öncesi Bireysel Çalışma	14	1,00
Ders Sonrası Bireysel Çalışma	14	1,00
Derse Katılım	14	2,00
Ara Sınav Hazırlık	7	1,00
Final Sınavı Hazırlık	14	1,00

Assesments

Activities	Weight (%)
Kısa Sınav (Quiz)	0,00
Ara Sınav	40,00
Proje	0,00
Final	60,00
Laboratuvar Sınavı	0,00
Performans Ödevi	0,00
Sunum	0,00
Seminer	0,00
Sözlü Sınav	0,00
Rapor	0,00
Dönem Ödevi	0,00

	P.O. 1	P.O. 2	P.O. 3	P.O. 4	P.O. 5	P.O. 6	P.O. 7	P.O. 8	P.O. 9	P.O. 10	P.O. 11	P.O. 12	P.O. 13	P.O. 14	P.O. 15	P.O. 16	P.O. 17	P.O. 18	P.O. 19	P.O. 20	P.O. 21	P.O. 22	P.O. 23	P.O. 24	
L.O. 1			5							5								5							4
L.O. 2			5					4		5								5							4
L.O. 3			5							5						4		5							4
L.O. 4			5							5								5							4
L.O. 5			5					4		5								5							4

Table :

- P.O. 1 :** Alanı ile ilgili öğretim programları, öğretim strateji, yöntem ve teknikleri ile ölçme ve değerlendirme bilgisine sahiptir.
- P.O. 2 :** Bilginin doğası kaynağı, sınırları, doğruluğu, güvenilirliği ve geçerliliğinin değerlendirilmesi konusunda bilgi sahibidir.
- P.O. 3 :** Öğrencilerin ihtiyaçlarını karşılayabilecek düzeyde alanı ile ilgili kavramları ve kavramlar arası ilişkileri açıklar.
- P.O. 4 :** Türk eğitim sistemi'nin amaç, ilke, vizyon, misyon, yapı ve işleyişini, sınıf yönetimi yaklaşımlarını ve eğitim ile ilgili kavramları konusunda bilgi sahibidir.
- P.O. 5 :** Öğrencilerin gelişim, öğrenme özellikleri ve güçlükleri ile ilgili bilgi sahibidir.
- P.O. 6 :** Matematik öğretim programıyla ilgili gelişme ve yenilikleri takip edip öğretme etkinliklerine uyarlar.
- P.O. 7 :** Matematiksel dili alan derslerinde ve matematik öğrenme ve öğretme sürecini planlarken doğru ve etkili şekilde kullanır.
- P.O. 8 :** Öğrencilerin gelişim özelliklerini, bireysel farklılıklarını, konu alanının özelliklerini ve kazanımlarını dikkate alarak en uygun öğretim strateji, yöntem ve tekniklerini uygular.
- P.O. 9 :** Öğrencilerin kazanımlarını farklı yöntemler kullanarak çok yönlü değerlendirir.
- P.O. 10 :** Matematiğin doğası ve tarihsel gelişimi hakkında bilgi sahibidir.
- P.O. 11 :** Türkçeyi kurallarına uygun düzgün ve etkili kullanabilme ve öğrencilerle sağlıklı iletişim kurabilme becerisine sahiptir.
- P.O. 12 :** Matematik ve diğer disiplinlerdeki problemlerle ilgili modellemeler ve çözümler üretir.
- P.O. 13 :** Farklı ölçme ve değerlendirme yöntem ve tekniklerini kullanır.
- P.O. 14 :** Bireysel ve grup çalışmalarında sorumluluk alır ve alınan görevi etkin bir şekilde yerine getirir.
- P.O. 15 :** Kendini bir birey olarak tanıır; yaratıcı ve güçlü yönlerini kullanır ve zayıf yönlerini geliştirir.
- P.O. 16 :** Edindiği bilgi ve becerileri eleştirel bir yaklaşımla değerlendirir.
- P.O. 17 :** Yaşam boyu öğrenmeye ilişkin olumlu bir tutum geliştirir.
- P.O. 18 :** Bilgiye ulaşma yollarını etkin bir şekilde kullanır.
- P.O. 19 :** Toplumsal sorumluluk bilinciyle yaşadığı sosyal çevre için mesleki proje ve etkinlikler planlar ve uygular
- P.O. 20 :** Bir yabancı dili en az Avrupa Dil portföyü B1 düzeyinde kullanarak alanındaki bilgileri izler ve meslektaşları ile iletişim kurar.
- P.O. 21 :** Bilgi ve iletişim teknolojilerini etkin bir şekilde kullanır.
- P.O. 22 :** Demokrasiye, insan haklarına, toplumsal, bilimsel ve mesleki etik değerlere uygun davranır.
- P.O. 23 :** Milli Eğitim Temel Kanunu'nda ifade edilen ulusal ve evrensel duyarlıkların bilincindedir.
- P.O. 24 :** Alanı ile ilgili öğretim programları, öğretim strateji, yöntem ve teknikleri ile ölçme ve değerlendirme bilgisine sahiptir.
- L.O. 1 :** Öğrenciler matematiğin bilimler arasındaki yerini açıklayabilecektir.
- L.O. 2 :** Öğrenciler teorem, ispat, aksiyom gibi temel matematiksel kavramları açıklayabilecektir.

L.O. 3 : Öğrenciler matematiğin nesnellik ve gerçek dünyaya uygulanabilirliğini açıklayabilecektir.

L.O. 4 : Öğrenciler matematik felsefesi alanında çalışan önemli bilim adamlarının görüşlerini açıklayabilecektir.

L.O. 5 : Öğrenciler matematik felsefesindeki temel kuramları açıklayabilecektir.