Fizik Bölümü / PHYSICS /

Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS
FZK-3006	Numerical Methods in Physics	2.00	2.00	0.00	3.00	5.00

Course Detail

Course Language	:	Turkish
Qualification Degree	:	Bachelor
Course Type	:	Compulsory
Preconditions	:	Not
Objectives of the Course	:	Many scientific problems cannot be solved in an analytical method. For these systems, numerical methods must be used to solve the equations. In this course, students will learn the numerical solution methods in the solution of the scientific problems.
Course Contents	:	Data analysis (Statistical knowledges) ,Solution of linear equation sets and Itreration, Curve Fitting, Intepolation, Solving the nonlinear equations, Numerical derivative ,Numerical integral, Numerical solutions of ordinary differential equations.
Recommended or Required Reading	:	Numerical analysis (Burden Richard L. , J. Douglas Faires) Sayısal Fizik (Bekir Karaoğlu) 2000 solved problems in numerical analysis (Scheid, Francis J) Nümerik Analiz (Scheid Francis J. Çeviren: H.H. Hacısalihoğlu) İstatistik (Spiegel Murray R. ve Stephens L.J. –Çeviren: Alptekin ESİN ve Salih Çelebioğlu) Numerical methods (John H. Mathews)
Planned Learning Activities and Teaching Methods	:	Midterm (40) final (% 60)
Recommended Optional Programme Components	:	Symbolic computation and office programs are important
Instructors	:	Prof. Dr. Hüseyin Çavuş
Instructor's Assistants	:	Non
Presentation Of Course	:	Face to face

Course Outcomes

Upon the completion of this course a student :

1 1) to learn how to use the numerical methods in solving the many scientific problems

2 2) to completing this course will learn the practicality on the problem solutions in real life

3 3) to apply the solving methods in the physical problems.

4 4) To recognize numerical methods and learn its properties

Preconditions

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Weekly Contents

	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods
1.Week	*Data analysis (Statistical knowledges)	*Data analysis (Statistical knowledges)			*Oral lectures Homeworks, discussions
2.Week	*Data analysis (Statistical knowledges)	*Data analysis (Statistical knowledges)			*Oral lectures Homeworks, discussions
3.Week	*Data analysis (Statistical knowledges)	*Data analysis (Statistical knowledges)			*Oral lectures Homeworks, discussions
4.Week	*Solution of linear equation sets- Elimination	*Solution of linear equation sets			*Oral lectures Homeworks, discussions
5.Week	*Solution of linear equation sets - Itreration	*Solution of linear equation sets - Itreration			*Oral lectures Homeworks, discussions
6.Week	*Solution of linear equation sets - Itreration	*Solution of linear equation sets - Itreration			*Oral lectures Homeworks, discussions
7.Week	* Curve Fitting	*Curve Fitting			*Oral lectures Homeworks, discussions
8.Week	* Intepolation	*Intepolation			*Oral lectures Homeworks, discussions
9.Week	*Solving the nonlinear equations	*Solving the nonlinear equations			*Oral lectures Homeworks, discussions
10.Week	*Solving the nonlinear equations	*Solving the nonlinear equations			*Oral lectures Homeworks, discussions
11.Week	*Numerical derivative	* Numerical derivative			*Oral lectures Homeworks, discussions
12.Week	* Numerical integral	*Numerical integral			*Oral lectures Homeworks, discussions
13.Week	*Numerical solutions of ordinary differential equations	*Numerical solutions of ordinary differential equations			*Oral lectures Homeworks, discussions
14.Week	*Numerical solutions of ordinary differential equations	*Numerical solutions of ordinary differential equations			*Oral lectures Homeworks, discussions

Assesment Methods %

1 Vize : 40.000

2 Final : 60.000

ECTS Workload

Activities	Count	Time(Hour)	Sum of Workload
Vize	1	2.00	2.00
Final	1	2.00	2.00
Attending lectures	14	4.00	56.00
Individual study before lecture	14	1.00	14.00
Individual study after lecture	14	1.00	14.00
Class Hours (14 weeks)	14	4.00	56.00
Final Exam Preparation	1	10.00	10.00
Mid Term Exam Preparation	1	10.00	10.00
		Total :	164.00
		Sum of Workload / 30 (Hour) :	5
		ECTS :	5.00

Program And OutcomeRelation

	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	4	4	4	5	3	4	4	3	3	4	5	5	4	3	3	3	0	0	0	0	0	0	0	0
L.O. 2	3	4	5	4	3	4	4	4	3	4	3	3	3	4	4	5	0	0	0	0	0	0	0	0
L.O. 3	5	3	4	3	4	4	4	3	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0
L.O. 4	5	5	3	4	5	4	4	4	4	4	4	4	4	5	3	3	0	0	0	0	0	0	0	0

Ders/Program Çıktıları İlişkisi

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	P.O. 2
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0	0	0	0