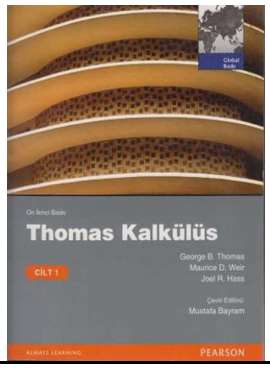
	TURKISH NAVAL ACADEMY **DEPARMENT OF BASIC SCIENCES** **COURSE CATALOGUE**	

Course Name	Code	Class/Semester	Duration (T+P)	Credit	ECTS
Mathematics-I	FEB-111	1/ 1.YY	5+0+0	5	5

Language of the course	:	Turkish
Level of the course	:	Bachelor's Degree
Prerequisite of the course	:	Not
Instructor	:	Mathematics Teaching Staff
Aim of the course	:	The aim of this course is to give basic mathematics lessons which will be taught in the upper classes in the first year, second semester and 2nd year.
Learning Outcomes	:	Students who successfully complete this course will be able to; 1) Form the mathematical principles of function, limit, derivative and integral concepts. 2) Establishing a relationship between variables can improve grip. 3) Derivatives and integrals can be used in the area and volume calculation. 4) Do the physical applications of derivative and integral. 5) Expressing the data scientifically with symbols and thinking disciplined and scientific.
Content	:	In this context, the students will be able to learn the concepts of function, limit, derivative and integral. In addition, by expressing the data with scientific symbols, they will lead to disciplined and scientific thinking.

<table>
<tr><td>Course Book</td><td>Calculus I

George B. THOMAS / Maurice D. WEIR / Joel HASS
 
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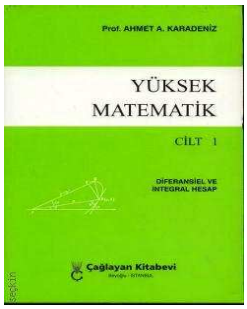
Prof. Ahmet A. KARADENİZ
 
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<tr><td>Evaluation System</td><td>
<table>
<tr><th colspan="2">Activities</th><th>Base Grade</th><th>Number</th><th colspan="2">Contribution to Review, %</th></tr>
<tr><td colspan="2">Mid term</td><td>50</td><td>1</td><td colspan="2">30%</td></tr>
<tr><td rowspan="6">Semester Evaluation</td><td>Quizes</td><td>50</td><td>1</td><td>%</td><td rowspan="6">10%</td></tr>
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<tr><td>Laboratory Applications</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Other Applications</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td colspan="2">Final Exam</td><td>50</td><td>1</td><td colspan="2">60%</td></tr>
<tr><td colspan="2">Make-up Exam</td><td>50</td><td>-</td><td colspan="2">100%</td></tr>
<tr><td colspan="2">Single Course / Extra Make-up Exam</td><td>50</td><td>-</td><td colspan="2">100%</td></tr>
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Nu.	Program Qualifications	Course Contribution Level				
		1	2	3	4	5
1	Define, model and solve science and math problems			X		
2	Analyze the data, make experiments and design, has the ability to interpret the results.			X		
3	Has the field knowledge to follow the latest developments in science and mathematics.			X		
4	Has the ability of logical and scientific thinking.				x	
5	Evaluates and analyzes the theoretical and practical knowledge gained in science and mathematics with a critical approach through scientific methods; develop solutions based on research for the solution of problems encountered.					X
6	Carries out any work in the field independently and takes responsibility as a team member when necessary					X
7	To be able to relate science and mathematics to different disciplines and to establish Science and Mathematical models of problems in different disciplines					x
8	Expresses his / her knowledge and experiences and suggestions for solutions in the field in written and oral form within the framework of ethical rules.					x

COURSE QUALIFICATIONS AND COURSE RELATIONS								
Level of Contribution	**1**		**2**		**3**		**4**	**5**
	Very low		Low		Medium		High	Very high
All Departments								
	CR-1	**CR-2**	**CR-3**	**CR-4**	**CR-5**	**CR-6**	**CR-7**	**CR-8**
LC-1	3	3		1	5	3		
LC-2	3	1		3	5		3	
LC-3	3	1		3	5	3	3	
LC-4	3	3			5	3	3	
LC-5	3	3		5	5			1

WEEKLY TOPICS		
Week	**TOPICS**	
	Theoritical	**Laboratory**
1	Single Variable Functions and Limit • Functions • The limit of a function • Special limits and uncertainties • Continuity in functions	--
2	Derivative • Change Rate and Derivative Concept • Derivation rules • The physical and geometric meaning of the derivative • The concept of differential • Higher order derivatives	--
3	Derivative • Role and Mean Value Theorems • Derivative of closed functions • Derivative of inverse functions • Derivatives of Trigonometric and Inverse Trigonometric Functions	--
4	Derivative • Derivatives of Exponential, Logarithmic, Hyperbolic and Inverse Hyperbolic Functions • Limits of uncertainty and L vehospital rules • Drawing a function graph	--
5	Derivative • Drawing a function graph • Maximum-Minimum calculation • Other applications of derivative • Inverse Derivative	--
6	Integral • Riemann Total • Definite integral calculation • Indefinite Integrals • Basic integral formulas • Integration with variable transformation-Simple variable change	--
7	Integral • Partial integration • Integral of Rational Functions • Integral of trigonometric functions	--
8	Integral • Integral of Rational Functions • Integral of trigonometric functions • Trigonometric Variable Change	--
9	Integral / MIDTERM EXAM • Trigonometric Variable Change • Midterm	--
10	MIDTERM / Applications of Integral • Midterm • Trigonometric Variable Change • Area Calculations with Integral	--
11	Applications of Integral • Area Calculations with Integral • Volume calculation • Spring length calculation	--

12	Applications of Integral • Spring length calculation • Surface areas	--
13	Applications of Integral • Surface areas • Center of gravity	--
14	Polar Coordinate • Polar coordinates • Graphic drawing • Area account	--
15	Polar Coordinate • Area account • Spring length calculation	--
16	Parametric Equations • Parametric equations and other coordinates. schist. relationships with • Spring length • Area account	--

ECTS / TABLE OF WORKLOAD

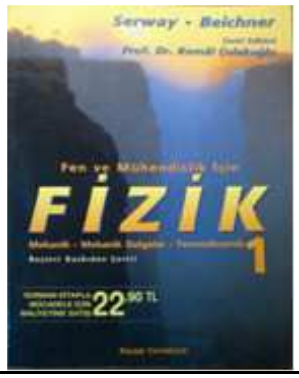
ACTIVITIES	**NUMBER**	**DURATIOM (HOUR)**	**ESTIMATED WORKLOAD (HOUR)**
Theoritical Course	15	5	75
General Laboratory Practice	-	-	-
Guided Problem Solving	15	3	45
Assignments and Report Submission	3	2	6
Term project	-	-	-
Project Presentation	-	-	-
Quiz	2	1	2
Midterm Exam	1	2	2
Individual Study for Midterm Exam	1	8	8
Final Exam	1	3	3
Individual Study for Final Exam	1	12	12
TOTAL WORKLOAD	153 Hours		
ECTS CREDIT OF THE COURSE	Total Workload/ 30 = 153 / 30 = 5,1		5 Credits

NOTE: 30 hour study is counted as 1 ECTS.

TURKISH NAVAL ACADEMY
DEPARTMENT OF BASIC SCIENCES
COURSE DETAILS

Course Name	Code	Class / Semester	Duration (T+P+L)	Credit	ECTS
PHYSICS-I	FEB-112	1/1	3+0+2	4	4

Language of the course	:	Turkish
Level of the course	:	Bachelor's Degree
Prerequisite of the course	:	-
Instructor	:	Physics Instructor
Aim of the course	:	The aim of this course is to teach the basic concepts of mechanics and dynamics and to gain the necessary background for students to learn higher level subjects.
Learning Outcomes	:	Students who successfully complete this course will be able to; 1.Distinguish the basic principles of single and multi-dimensional motion. 2. Distinguish the basic concepts of particle dynamics. 3. Apply the basic concepts of particle dynamics to problems 4. Distinguish business and energy concepts. 5. Apply business and energy concepts to problems. 6. Distinguish the basic concepts of linear and angular momentum. 7. Distinguish basic concepts of rotational kinematics.
Content	:	Measurement, Vectors, One Dimensional Motion, Two Dimensional Motion, Laws of Motion, Circular Motion and Other Applications of Newton's Law of Motion, Work and Kinetic Energy, Potential Energy and Conservation of Energy, Linear Momentum and Collisions, Rotation of Solid Bodies Around a Fixed Axis, Rolling Motion and Angular Momentum are subjects.

<table>
<tr><td>Course Book</td><td>Fen ve Mühendislik için Fizik 1, Translation: Prof. Dr. Kemal Çolakoğlu; Editors: R.A. Serway, R.C. Beichner,J.W. Jevett, Palme Yayıncılık, Ankara.
 
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 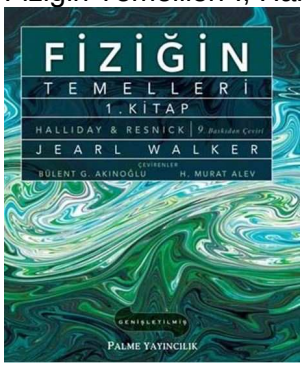
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<tr><td>Laboratory Application</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Other Applications</td><td>50</td><td>1</td><td>%</td></tr>
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Page No.	Program Qualifications	Course Contribution Level				
		1	2	3	4	5
1	Have theoretical and practical knowledge about mechanical subjects					x
2	Use theoretical and practical knowledge about mechanical topics.					x
3	To be able to examine the concepts and laws in the field of physics with scientific methods, to analyze the problem, to analyze the solutions and to interpret the results.				x	
4	May take responsibility as a team member or individually.				x	
5	Plan and manage activities by taking a leading role in teamwork.				x	
6	To be able to inform the environment about the basic subjects of physics.					x
7	Use the equipment in the physics laboratory, make experiments.					x
8	To be able to follow current topics related to physics by using various teaching environments.				x	
9	Know and apply problem solving strategies in physics.					x
10	Understand the basic concepts of physics in English.				x	

COURSE QUALIFICATIONS AND COURSE RELATIONS										
Contribution Level	1		2		3	4		5		
	Very low		Low		Middle	High		Very high		
PHYSICS-1										
	CR-1	CR-2	CR-3	CR-4	CR-5	CR-6	CR-7	CR-8	CR-9	CR-10
LC-1	5	5	5			4		4	5	
LC-2	5	5	5			4			4	
LC-3	3			4	4				5	
LC-4			5							
LC-5				4	4				5	
LC-6	5	5	5							
LC-7	5	5	5							

WEEKLY TOPICS			
Week	**TOPICS**		
	Theoritical	**Practical**	**Laboratory**
1	Measurement, Vectors	--	2
2	Motion in One Dimension	--	2
3	Motion in Two Dimensions, The Laws of Motion	--	2
4	The Laws of Motion	--	2
5	Cİrcular Motion and Other Applications of Newton's Laws	--	2
6	Work and Energy	--	2
7	Work and Energy	--	2
8	Linear Momentum and Collisions	--	2
9	Linear Momentum and Collisions	--	2
10	The Center of Mass	--	2
11	Rotation of a Rigid Object About a Fixed Axis	--	2
12	Rotation of a Rigid Object About a Fixed Axis	--	2
13	Rolling Motion and Angular Momentum	--	2
14	Rolling Motion and Angular Momentum	--	2
15	Rolling Motion and Angular Momentum	--	2
16	Overview	--	--

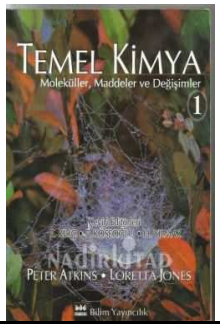
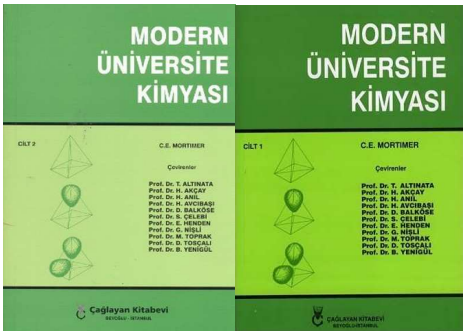
ECTS / TABLE OF WORKLOAD				
ACTIVITIES		**NUMBER**	**DURATION (HOUR)**	**ESTIMATED WORKLOAD (HOUR)**
Theoritical Course		15	3	45
General Laboratory Practice		15	2	30
Problem solving with guidance	**Class Work**	15	1	15
	Working individually or in groups	15	1	15
Assignments and Report Submission		8	1	8
Term project		--	--	--
Project Presentation		--	--	--
Other Studies		1	1	1
Midterm Exam		1	2	2
Individual Study for Midterm Exam		1	6	6
Final Exam		1	2	2
Individual Study for Final Exam		1	10	10
TOTAL WORKLOAD		134 Hours		
ECTS CREDIT OF THE COURSE		TOTAL WORKLOAD / 30 = 134 / 30 = 4,46		4 Credits

TURKISH NAVAL ACADEMY
DEPARTMENT OF BASIC SCIENCES
COURSE DETAILS

Course Name	Code	Class / Semester	Duration (T+P)	Credit	ECTS
Chemistry	FEB-113	1/1	2+0+0	2	2

Language of the course	:	Turkish
Level of the course	:	Bachelor's Degree
Prerequisite of the course	:	High School-I, High School-II, High School-III Chemistry
Instructor	:	Chemistry Instructor
Aim of the course	:	• To teach the basic concepts and laws of chemistry. • To enable students to comprehend the ways of research, to have a positive and scientific view. • To help the students to think deeply and deeply about the chemical events. • Chemistry-II course on chemistry related topics and thermodynamics, material knowledge, electronics and other courses.
Learning Outcomes	:	Students who successfully complete this course; 1. Comprehend chemical laws and make calculations. 2. Describe the solvent and solute. 3. Apply similar concept of solver in daily life. 4. Know the importance of energy. 5. Know the difference between thermo energy and nuclear energy. 6. Knows radiation units and radiation protection methods. 7. Know the structure of the atom, can find the place in the periodic table. 8. Question whether atomic particles are basic particles. 9. Derive equilibrium expression through the expression of speed in reversible reactions. 10. Uses gas laws and kinetic theory in explaining the behavior of gases.
Content	:	**Structure of atom:** Atomic spectra, quantum numbers, atomic orbitals, electronic structure and periodic system, flame trials **Gases :** Properties of gases, gas laws, molecular movement, real gases, liquefying of gases, **Liquids and Solids :** Intermolecular forces, liquid state, solid state, crystal lattice, alloys, hydrate water, boiling in vacuum

		Solutions : Solution properties, factors affecting the solubility, solution concentrations. **Thermochemistry :** Energy, heat and enthalpy, heat measurement, enthalpy of chemical change, aggregation of reaction temperatures. **Chemical Kinetics :** Reaction rates, concentrations and reaction rates, single step reactions, factors affecting the reaction rate. **Chemical Equilibrium :** Reversible reactions and chemical equilibrium, equilibrium constants, Le Chatelier principle. **Salt Solutions :** Common ion effect, solubility product, precipitation and solubility product, buffer solutions. **Nuclear Chemistry :** Atomic nuclei, radioactive radiation, nuclear bond energy, radioactive decay law, age determination, fission fusion reactions, nuclear reactors, radioactive units.

Course Book	Temel Kimya(CİLT I), Bilim Publicutions, Peter ATKINS/ Loretta JONES, Translation : Prof.Dr.Esma KILIÇ-Prof.Dr.Fitnat KÖSEOĞLU-Prof.Dr.Hamza YILMAZ. 
Other Sources	Modern Üniversite Kimyası (CİLT I), Çağlayan Publicutions, C.E.MORTIMER, Translation : Prof.Dr.T.ALTINATA-Prof.Dr.H.AKÇAY-Prof.Dr.H.ANIL 
Assignments and Projects	
Computer Usage	
Other Applications	

			Base Grade	Piece	Contribution to Review, %	
Evaluation System	Midterm		50	1	30%	
	Semester Evaluation	Quizzes	50	1	%	10%
		Assigments	50	1	%	
		Projects	50	1	%	
		Term Project / Project	50	1	%	
		Laboratory Application	50	1	%	
		Other Applications	50	1	%	
	Final Exam		50	1	60%	
	Makeup Exam		50	-	100%	
	Single Course / Extra Makeup Exam		50	-	100%	

Page No.	Program Qualifications	Course Contribution Level				
		1	**2**	**3**	**4**	**5**
1	Have theoretical and practical knowledge about basic chemistry subjects					x
2	Use theoretical and practical knowledge about basic chemistry topics.					x
3	To be able to examine the concepts and laws in the field of chemistry with scientific methods, to analyze the problem, to analyze the solutions and to interpret the results.				x	
4	May take responsibility as a team member or individually.				x	
5	Plan and manage activities by taking a leading role in teamwork.				x	
6	To be able to inform the environment about the basic subjects of chemistry.					x
7	Use the equipment in the chemistry laboratory, make experiments.					x
8	To be able to follow current topics related to chemistry by using various teaching environments.				x	
9	Know and apply problem solving strategies in chemistry.					x
10	Understand the basic concepts of chemistry in English.				x	

COURSE QUALIFICATIONS AND COURSE RELATIONS										
Contribution Level	**1**		**2**			**3**	**4**		**5**	
	Very low		Low			Middle	High		Very high	
DEPARTMENT OF CHEMISTRY										
	CR-1	**CR-2**	**CR-3**	**CR-4**	**CR-5**	**CR-6**	**CR-7**	**CR-8**	**CR-9**	**CR-10**
LC-1	**5**	**5**				**5**				
LC-2						**4**		**4**		
LC-3									**5**	
LC-4				**4**						
LC-5			**4**							
LC-6								**4**	**4**	
LC-7			**4**							**3**
LC-8									**5**	
LC-9			**4**				**5**			
LC-10						**5**		**4**		

WEEKLY TOPICS		
Week	**TOPICS**	
	Theoritical	**Laboratory**
1	Atomic Structure: Quantum Numbers, Electronic Structure	--
2	Gases: Gas Laws	--
3	Gases: Gas Laws	--
4	Gases: Real Gases, Liquefaction in Gases	--
5	Liquids and Solids: General Properties, Steam Pressures, Alloys	--
6	Solutions: Properties of Solutions, Concentrations	--
7	Thermochemistry: Energy, Heat, Enthalpy	--
8	Thermochemistry: Hess's Law	--
9	MIDTERM EXAM WEEK	
10	Chemical Kinetics: Reaction Rate General Concepts	--
11	Chemical Kinetics: Factors Affecting Reaction Rate	--
12	Chemical Equilibrium: Balance, Equilibrium Constant, Calculations	--
13	Acids and Bases: Strong Acids and Bases, Concept of Ph, Acidity-Base Equilibrium	--
14	Salt Solutions: Hydrolysis, Buffer Solution, Solubility Equations	--
15	Nuclear Chemistry: Radioactive Decays, Half Life, Fission, Fusion	--
16	Nuclear Chemistry: Nuclear Reactors, Radioactive Units	--

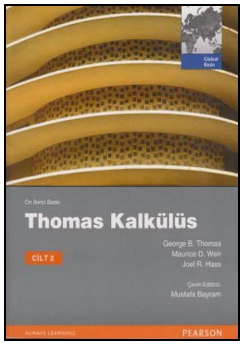
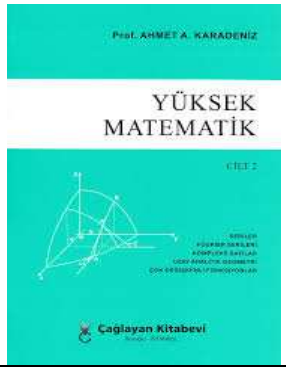
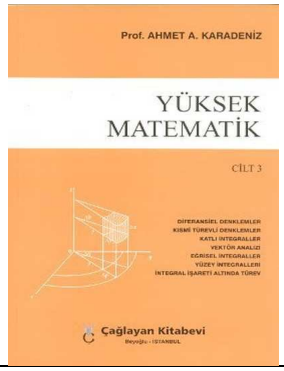
ECTS / TABLE OF WORKLOAD

ACTIVITIES		NUMBER	DURATION (HOUR)	ESTIMATED WORKLOAD (HOUR)
Theoritical Course	**Theoritical Presentation**	15	2	30
Study Hours Out of Class		15	1	15
Assignments and Report Submission		1	2	2
Term project		--	--	--
Project Presentation		--	--	--
Other Studies		1	4	4
Midterm Exam		1	2	2
Individual Study for Midterm Exam		1	5	5
Final Exam		1	2	2
Individual Study for Final Exam		1	8	8
TOTAL WORKLOAD		68 Hours		
ECTS CREDIT OF THE COURSE		TOTAL WORKLOAD / 30 = 68 / 30 = 2,26		2 Credits

	TURKISH NAVAL ACADEMY **DEPARMENT OF BASIC SCIENCES** **COURSE CATALOGUE**	

Course Name	Code	Class/Semester	Duration (T+P)	Credit	ECTS
Mathematics-II	FEB-121	1/ 2. YY	5+0+0	5	5

Language of the course	:	Turkish
Level of the course	:	Bachelor's Degree
Prerequisite of the course	:	Mathematics-1
Instructor	:	Mathematics Teaching Staff
Aim of the course	:	The Mathematics-2 course is a prerequisite for the professional sciences courses and engineering majors program at the Naval Academy.
Learning Outcomes	:	Students who successfully complete this course will be able to; 1) Know the concept of convergence and convergence in series and series, can open functions to series. 2) Solve problems in planes and vectors in space. 3) To be able to recognize limit, derivative and tangent and plane equations in multivariable functions and know Taylor formula. 4) Can take two and triple integrals with the help of multi-storey integrals, can make applications related to space and volume. 5) Know the concept of vector valued functions, curvilinear integrals, vector fields, use Green's theorem, calculate the surface area and take the surface integral.
Content	:	In this context, students, series, planets and vectors in space, Multivariate Functions and Multilevel Integrals to develop the principles of mathematics in students, to increase knowledge and mathematical symbols to improve the ability to transfer the necessary infrastructure is to provide.

<table>
<tr><td>Course Book</td><td>Calculus II
Thomas / Finney
  </td></tr>
<tr><td>Other Sources</td><td>Yüksek Matematik Cilt 2 – Cilt 3
Prof.Ahmet A. KARADENİZ
 
  </td></tr>
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Nu.	Program Qualifications	Course Contribution Level				
		1	2	3	4	5
1	Define, model and solve science and math problems.			X		
2	Analyze the data, make experiments and design, has the ability to interpret the results.			X		
3	To be able to follow the latest developments in science and mathematics.			X		
4	Has the ability of logical and scientific thinking.				X	
5	Evaluates and analyzes the theoretical and practical knowledge gained in science and mathematics with a critical approach through scientific methods; develop solutions based on research for the solution of problems encountered.					X
6	Carries out any work in the field independently and takes responsibility as a team member when necessary.					X
7	To be able to relate science and mathematics to different disciplines and to establish Science and Mathematical models of problems in different disciplines					X
8	Expresses his / her knowledge and experiences and suggestions for solutions in the field in written and oral form within the framework of ethical rules.					X

COURSE QUALIFICATIONS AND COURSE RELATIONS								
Level of Contribution		1		2	3		4	5
		Very low		Low	Medium		High	Very high
All Departments								
	CR-1	CR-2	CR-3	CR-4	CR-5	CR-6	CR-7	CR-8
LC-1	5	3		1	3	4	2	
LC-2	3	2			3	5	3	
LC-3	5	3		1	4	5	3	
LC-4	5	3		3	4	5	3	
LC-5	5	3		3	4	5	3	

WEEKLY TOPICS		
Week	**TOPICS**	
	Theoritical	**Laboratory**
1	Series • Sequence Concept, Limit and Convergence of Sequences • Serial Concept, Convergence of Infinite Series, Convergence Tests • Convergence of Series of Positive Terms • Convergence of Alternate Series	--
2	Series • Power Series and Convergence • Expansion of Functions to Power Series and Operations • Taylor-MacLaurin Series Expansions	--
3	Planes and Vectors in Space • Coordinate Systems • Vectors • Vector Operations • Plane Equations in Space	--
4	Planes and Vectors in Space • Correct Equations in Space • Situations of planes and planes relative to each other • Multivariate Functions • Limit and continuity in multivariable functions	--
5	Multivariable Functions • Continuity in multivariable functions • Partial derivatives • Higher order partial derivatives • Chain rule • Derivatives of closed functions	--
6	Multivariable Functions • Directional derivatives • Gradient vectors • Tangent planes • Extreme values and saddle points	--
7	Multivariable Functions • Extreme values and saddle points • Maximum and minimum problems in closed areas • ÇDF Taylor series expansion • Taylor polynomials formula	--
8	Midterm	--
9	Multilayer Integrals • Double integrals • Applications of double integrals • Variable transformation in multiple integrals • Double integrals in polar form	--
10	Multilayer Integrals • Triple integrals • Triple integrals and volume • Mass and moments in three dimensions	--
11	Multilayer Integrals • Triple integrals in cylindrical coordinates • Triple integrals in spherical coordinates • Applications	--

12	Vector Valued Functions • Vectors and vector valued functions • Derivative and integral	--
13	Vector Valued Functions • Curvilinear integrals • Vector fields	--
14	Vector Valued Functions • Road independence, potential function and conservation areas • Green's theorem • Surface area and surface integrals	--
15	Vector Valued Functions • Divergence and Stokes theorems	--

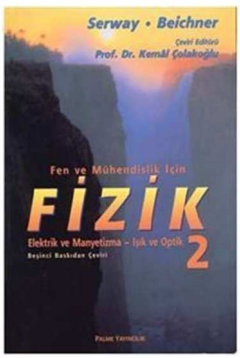
ECTS / TABLE OF WORKLOAD

ACTIVITIES	**NUMBER**	**DURATIOM (HOUR)**	**ESTIMATED WORKLOAD (HOUR)**
Theoritical Course	14	5	70
General Laboratory Practice	--	--	--
Guided Problem Solving	14	3	42
Assignments and Report Submission	3	2	6
Term project	--	--	--
Project Presentation	--	--	--
Quiz	2	1	2
Midterm Exam	1	2	2
Individual Study for Midterm Exam	1	8	8
Final Exam	1	3	3
Individual Study for Final Exam	1	12	12
TOTAL WORKLOAD	145 Hours		
ECTS CREDIT OF THE COURSE	Total Workload / 30 = 145 / 30 = 4,83		5 Credits

TURKISH NAVAL ACADEMY
DEPARTMENT OF BASIC SCIENCES
COURSE DETAILS

Course Name	Code	Class / Semester	Duration (T+P+L)	Credit	ECTS
PHYSICS-II	FEB-122	1/2	3+0+2	4	4

Language of the course	:	Turkish
Level of the course	:	Bachelor's Degree
Prerequisite of the course	:	Physics-I
Instructor	:	Physics Instructor
Aim of the course	:	To teach the basic concepts about electromagnetism and to gain the necessary infrastructure for the higher level subjects that the students will learn in the following years.
Learning Outcomes	:	Students who successfully complete this course will be able to; 1. Distinguish between electric charge and electric field. 2. Distinguish and apply basic concepts of capacitance and dielectrics. 3. Distinguish the concept of current and apply it to electrical circuits. 4. Distinguish the magnetic properties of matter. 5. He / she can examine electromagnetic waves by synthesizing electricity and magnetism concepts.
Content	:	Electric Fields, Gauss's Law, Electric Potential, Capacitance and Dielectrics, Current and Resistor, Direct Current Circuits, Magnetic Fields, Magnetic Field Sources, Faraday's Law, Inductance, Alternating Current Circuits.

<table>
<tr><td>Course Book</td><td>Fen ve Mühendislik için Fizik 2, Translation: Prof. Dr. Kemal Çolakoğlu; Editors: R.A. Serway, R.C. Beichner,J.W. Jevett, Palme Yayıncılık, Ankara.
 
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 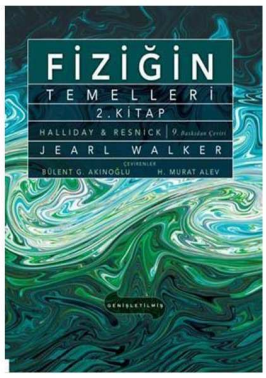
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<tr><td>Assignments and Projects</td><td>Solution of end-of-course problems</td></tr>
<tr><td>Evaluation System</td><td>
<table>
<tr><th colspan="2">Activities</th><th>Base Grade</th><th>Piece</th><th colspan="2">Contribution to Review, %</th></tr>
<tr><td colspan="2">Midterm</td><td>50</td><td>1</td><td colspan="2">30%</td></tr>
<tr><td rowspan="6">Semester Evaluation</td><td>Quizzes</td><td>50</td><td>1</td><td>%</td><td rowspan="6">10%</td></tr>
<tr><td>Assigments</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Projects</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Term Project / Project</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Laboratory Application</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Other Applications</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td colspan="2">Final Exam</td><td>50</td><td>1</td><td colspan="2">60%</td></tr>
<tr><td colspan="2">Makeup Exam</td><td>50</td><td>-</td><td colspan="2">100%</td></tr>
<tr><td colspan="2">Single Course / Extra Makeup Exam</td><td>50</td><td>-</td><td colspan="2">100%</td></tr>
</table>
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</table>

Page No.	Program Qualifications	Course Contribution Level				
		1	2	3	4	5
1	Have theoretical and practical knowledge about electricity and magnetism subjects					x
2	Use theoretical and practical knowledge about electricity and magnetism topics.					x
3	To be able to examine the concepts and laws in the field of physics with scientific methods, to analyze the problem, to analyze the solutions and to interpret the results.				x	
4	May take responsibility as a team member or individually.				x	
5	Plan and manage activities by taking a leading role in teamwork.				x	
6	To be able to inform the environment about the basic subjects of physics.					x
7	Use the equipment in the physics laboratory, make experiments.					x
8	To be able to follow current topics related to physics by using various teaching environments.				x	
9	Know and apply problem solving strategies in physics.					x
10	Understand the basic concepts of physics in English.				x	

COURSE QUALIFICATIONS AND COURSE RELATIONS										
Contribution Level		1		2		3	4		5	
		Very low		Low		Middle	High		Very high	
PHYSICS-2										
	CR-1	CR-2	CR-3	CR-4	CR-5	CR-6	CR-7	CR-8	CR-9	CR-10
LC-1	5	5	5			4	5	4		
LC-2	5	5	5			5	5	4		
LC-3	5	5		5	4		5			
LC-4	5	5						4		
LC-5	5	5					4	4	5	

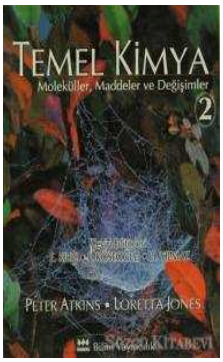
WEEKLY TOPICS			
Week	**TOPICS**		
	Theoritical	**Practical**	**Laboratory**
1	Electric Fields	--	2
2	Gauss's Law	--	2
3	Electric Potential	--	2
4	Capaticance and Dielectrics	--	2
5	Capaticance and Dielectrics	--	2
6	Current and Resistance	--	2
7	Direct Current Circuits	--	2
8	Kirchoff's Rules	--	--
9	Magnetic Fields	--	2
10	Sources of the Magnetic Field, The Biot-Savart Law	--	2
11	Ampere's Law	--	2
12	Faraday's Law	--	2
13	Faraday's Law	--	2
14	Inductance, Alternating-Current Circuits	--	2
15	Inductance, Alternating-Current Circuits	--	2

ECTS / TABLE OF WORKLOAD				
ACTIVITIES		**NUMBER**	**DURATION (HOUR)**	**ESTIMATED WORKLOAD (HOUR)**
Theoritical Course		14	3	42
General Laboratory Practice		14	2	28
Problem solving with guidance	**Class Work**	14	1	14
	Working individually or in groups	14	1	14
Assignments and Report Submission		8	1	8
Term project		--	--	--
Project Presentation		--	--	--
Other Studies		1	1	1
Midterm Exam		1	2	2
Individual Study for Midterm Exam		1	6	6
Final Exam		1	2	2
Individual Study for Final Exam		1	10	10
TOTAL WORKLOAD		127 Hours		
ECTS CREDIT OF THE COURSE		TOTAL WORKLOAD / 30 = 127 / 30 = 4,23		4 Credits

TURKISH NAVAL ACADEMY
DEPARMENT OF BASIC SCIENCES
COURSE DETAILS

Course Name	Code	Class/Semester	Duration (T+P)	Credit	ECTS
Maritime Chemistry	FEB-123	1/2	2+0+0	2	2

Language of the course	:	Turkish
Level of the course	:	Bachelor's Degree
Prerequisite of the course	:	Chemistry
Instructor	:	Chemistry Instructor
Aim of the course	:	To teach the basic concepts related to maritime chemistry and to gain the background of the skills that students should have in the problem areas in the following years.
Learning Outcomes	:	Students who successfully complete this course will be able to; 1. Define the electrochemical concepts. 2. Explain the working principles of batteries and give examples of the batteries used in Turkish Navy. 3. Explain the types of corrosion encountered in ships and methods of corrosion protection. 4. Define the paints used in ships and explain the reasons. 5. Explain the physical and chemical properties of water used in Turkish Navy 6. Explain the methods of obtaining drinking water from sea water. 7. Explain the structure of petroleum, classify fuel and lubricating oils used in Turkish Navy. 8. Can classify explosive and chemical warfare agents. 9. Explain the effects of the atmosphere in the Naval environment on the human.
Content	:	1. Electrochemistry, 2. Corrosion, 3. Marine Paints, 4. Use of Water in Navy, 5. Petroleum and Lubricating Oils used in Navy, 6. Explosives and Chemical Warfare 7. The Effect of Environment on Humans.

Course Book	Chemistry-II Textbook, Turkish Naval Academy Printing House, 2000 Prepared by Teacher Senior Colonel İhsan DOĞRU. 
Other Sources	Atkins, Peter ve Jones, Loretta, Temel Kimya II, Çev.: Kılıç, E., Köseoğlu, F. ve Yılmaz, H., Bilim Yayıncılık, Ankara 1999. 
Homeworks and Projects	At the end of the course, short assignments of study questions are given to control student achievements.
Use of Computer	Students can do their homework by using computer. (Not required)
Other Applications	Experiments are carried out in the chemistry laboratory in order to reinforce the subjects.

			Base Grade	Number	Contribution to Review, %	
Evaluation System	Ara Sınav		50	1	30%	
	Semester Evaluation	Quizes	50	2	%	10%
		Assigments	50	2	%	
		Projects	50	-	%	
		Term Paper/ Project	50	-	%	
		Laboratory Applications	50	1	%	
		Other Applications	50	-	%	
	Final Exam		50	1	60%	
	Make-up Exam		50	-	100%	
	Single Course / Extra Make-up Exam		50	-	100%	

Nu.	**Program Qualifications**	**Course Contribution Level**				
		1	**2**	**3**	**4**	**5**
1	To have theoretical and practical knowledge about maritime chemistry.					x
2	To be able to use theoretical and practical knowledge about maritime chemistry.					x
3	To be able to examine the concepts and laws in the field of chemistry with scientific methods, to present the problem, to analyze, to produce solutions and to interpret the results.				x	
4	To be able to take responsibility as individual or a team member in applications.				x	
5	To be able to plan and manage activities by taking a leading role in teamwork.				x	
6	To be able to inform the environment about the basic issues in the field of chemistry.					x
7	To be able to use the equipment in the chemistry laboratory and do the experiments.				x	
8	To be able to follow current topics related to chemistry by using various teaching environments.				x	
9	To be able to know and apply problem solving strategies in chemistry.					x
10	To be able to understand the basic concepts of chemistry in English.				x	

COURSE QUALIFICATIONS AND COURSE RELATIONS										
Level of Contribution	**1**		**2**		**3**	**4**		**5**		
	Very low		Low		Medium	High		Very high		
DEPARTMENT OF CHEMISTRY										
	CR-1	**CR-2**	**CR-3**	**CR-4**	**CR-5**	**CR-6**	**CR-7**	**CR-8**	**CR-9**	**CR-10**
LC-1			**4**			**5**				
LC-2				**5**					**5**	
LC-3	**5**	**5**				**5**				
LC-4				**4**						
LC-5							**4**	**4**		
LC-6	**4**	**4**								
LC-7						**5**				
LC-8				**4**			**4**			
LC-9		**4**							**5**	
LC-10							**4**			

WEEKLY TOPICS		
Week	**TOPICS**	
	Theoritical	**Laboratory**
1	Electronic and Ionic Conductivity	--
2	Electrolysis	--
3	Galvanic Cells, Cell Potential	--
4	Applied Batteries	--
5	Corrosion Definition, Classification	--
6	Types of Corrosion on Board	--
7	Corrosion Control	--
8	Marine Paints	--
9	MIDTERM	--
10	Physical and Chemical Properties of Water	--
11	Ways of Getting Drinking water from sea water	--
12	Petroleum Structure, Properties and Classification	--
13	Explosion Definition, Explosives Properties and Classification	--
14	Explosion, Chemical Warfare	--
15	Production of Gunpowder, Cotton and Smokeless Gunpowder	--

ECTS / TABLE OF WORKLOAD			
ACTIVITIES	**NUMBER**	**DURATION (HOUR)**	**ESTIMATED WORKLOAD (HOUR)**
Theoritical Course	14	2	28
Study Hours Out of Class	14	1	14
Assignments and Submission	2	1	2
Semester Project	--	--	--
Project Presentation	--	--	--
Other Studies	1	4	4
Midterm	1	2	2
Individual Study for Midterm Exam	1	5	5
Final Exam	1	2	2
Individual Study for Final Exam	1	8	8
TOTAL WORKLOAD	65 Hours		
ECTS CREDIT OF THE COURSE	Total Workload / 30 = 65 / 30 = 2,16		2 Credit

	TURKISH NAVAL ACADEMY **DEPARMENT OF BASIC SCIENCES** **COURSE CATALOGUE**	

Course Name	Code	Class/Semester	Duration (T+P)	Credit	ECTS
DIFFERENTIAL EQUATIONS	FEB-211	2/ 1.YY	3+0+0	3	3

Language of the course	:	Turkish
Level of the course	:	Bachelor's Degree
Prerequisite of the course	:	Not
Instructor	:	Mathematics Teaching Staff
Aim of the course	:	The aim of the course of Differential Equations; The aim of this course is to provide students with general mathematical culture which will be the basis of professional sciences courses and engineering discipline programs taught in upper classes about Laplace Transformations, Ordinary Differential Equations, Fourier Series, Partial Differential Equations..
Learning Outcomes	:	Students who successfully complete this course will be able to; 1) Calculate Laplace Transforms of Functions 2) Find solutions and applications of Ordinary Differential Equations. 3) Solve systems of equations by using Fourier Series. 4) Find the solution of Partial Differential Equations and do their applications.
Content	:	In this context, students will learn the concepts of Laplace Transformations, Ordinary Differential Equations, Fourier Series, Partial Differential Equations and will be able to apply engineering applications. In addition, by expressing the data scientifically, it will lead to disciplined and scientific thinking.

<table>
<tr><td>Course Book</td><td>Diferansiyel Denklemlerin Temelleri
Nagle Saff SNİDER
(Çev. Prof. Dr. Ogün DOĞRU)
  </td></tr>
<tr><td>Other Sources</td><td>Çözümlü Diferansiyel Denklemler
Yrd. Doç. Dr. Melek HAMZAOĞLU
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<tr><td>Assignments and Projects</td><td></td></tr>
<tr><td>Computer Usage</td><td>Students can do their homework by using computer (not obligatory).</td></tr>
<tr><td>Other Applications</td><td></td></tr>
<tr><td>Evaluation System</td><td>
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<tr><th colspan="2">Activities</th><th>Base Grade</th><th>Number</th><th colspan="2">Contribution to Review, %</th></tr>
<tr><td colspan="2">Mid term</td><td>50</td><td>1</td><td colspan="2">30%</td></tr>
<tr><td rowspan="6">Semester Evaluation</td><td>Quizes</td><td>50</td><td>1</td><td>%</td><td rowspan="6">10%</td></tr>
<tr><td>Assigments</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Projects</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Term Paper/ Project</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Laboratory Applications</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Other Applications</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td colspan="2">Final Exam</td><td>50</td><td>1</td><td colspan="2">%60</td></tr>
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Nu.	Program Qualifications	Course Contribution Level				
		1	2	3	4	5
1	Define, model and solve science and math problems.			X		
2	Analyze the data, make experiments and design, has the ability to interpret the results.			X		
3	To be able to follow the latest developments in science and mathematics.			X		
4	Has the ability of logical and scientific thinking.				X	
5	Evaluates and analyzes the theoretical and practical knowledge gained in science and mathematics with a critical approach through scientific methods; develop solutions based on research for the solution of problems encountered.					X
6	Carries out any work in the field independently and takes responsibility as a team member when necessary.					X
7	To be able to relate science and mathematics to different disciplines and to establish Science and Mathematical models of problems in different disciplines					X
8	Expresses his / her knowledge and experiences and suggestions for solutions in the field in written and oral form within the framework of ethical rules.					X

COURSE QUALIFICATIONS AND COURSE RELATIONS								
Level of Contribution		**1**		**2**	**3**		**4**	**5**
		Very low		Low	Medium		High	Very high
All Departments								
	CR-1	**CR-2**	**CR-3**	**CR-4**	**CR-5**	**CR-6**	**CR-7**	**CR-8**
LC-1	3	3		1	2	5	4	
LC-2	3	4		1	2	5	4	
LC-3	3	3		1	2	5	4	
LC-4	3	4		1	2	5	4	

WEEKLY TOPICS		
Week	**TOPICS**	
	Theoritical	**Laboratory**
1	DIFFERENTIAL EQUATIONS • Definition, degree and order of differential equations • Differential equation types, creation, solutions • General, special, singular solutions and geometrical meaning	--
2	DIFFERENTIAL EQUATIONS • Variable differential equations • Homogeneous differential equations • Linear differential equations	--
3	DIFFERENTIAL EQUATIONS • Applications of linear differential equations • Bernoulli differential equations • Exact differential equations	--
4	DIFFERENTIAL DIFFERENTIAL EQUATIONS • Lagrance and Clairaut differential equations • Equations with no variables	--
5	DIFFERENTIAL DIFFERENTIAL EQUATIONS • n. Ordering linear differential equations • Homogeneous linear equations with constant coefficients • Solution of second-order linear equations with constant coefficients by indeterminate coefficients	--
6	DIFFERENTIAL DIFFERENTIAL EQUATIONS • Solution of second-order linear equations with constant coefficients by indeterminate coefficients • Solution of second-order linear equations with constant coefficients by changing the parameters	--
7	DIFFERENTIAL DIFFERENTIAL EQUATIONS • Linear differential equations with variable coefficients • Systems of linear equations • Solution of differential equations by Laplace transforms	--
8	MIDTERM	--
9	LAPLACE TRANSFORMATIONS • Laplace transformations • Laplace transforms properties	--
10	LAPLACE TRANSFORMATIONS • Laplace transform of derived functions, integrals • Periodic functions • Gamma function	--
11	REVERSE LAPLACE TRANSFORMATIONS • Inverted laplace conversions • Properties of inverse laplace transformations	--
12	REVERSE LAPLACE TRANSFORMATIONS Methods for finding inverse laplace transforms	--
13	REVERSE LAPLACE TRANSFORMATIONS • Separation method for simple fractions • Heaviside expansion and convolution theorem	--
14	FOURİER SERIES • Solution of systems of differential equations by Laplace transforms • Fourier series	--
15	FOURİER SERIES • Single, double and periodic functions • Fourier series of single and double functions	--

16	PARTIAL DIFFERENTIAL EQUATIONS • Partial differential equations	--

ECTS / TABLE OF WORKLOAD			
ACTIVITIES	**NUMBER**	**DURATIOM (HOUR)**	**ESTIMATED WORKLOAD (HOUR)**
Theoritical Course	15	3	45
General Laboratory Practice	--	--	--
Guided Problem Solving	15	2	30
Assignments and Report Submission	2	3	6
Term project	--	--	--
Project Presentation	--	--	--
Quiz	2	1	2
Midterm Exam	1	2	2
Individual Study for Midterm Exam	1	6	6
Final Exam	1	2	2
Individual Study for Final Exam	1	10	10
TOTAL WORKLOAD	103		
ECTS CREDIT OF THE COURSE	Total Workload / 30 = 103 / 30 = 3,43		3 Credits

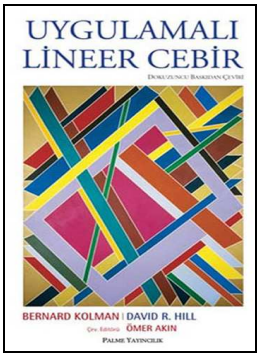
	TURKISH NAVAL ACADEMY **DEPARMENT OF BASIC SCIENCES** **COURSE CATALOGUE**	

Course Name	Code	Class/Semester	Duration (T+P)	Credit	ECTS
LINEAR ALGEBRA	FEB-221	2/2. YY	3+0+0	3	3

Language of the course	:	Turkish
Level of the course	:	Bachelor's Degree
Prerequisite of the course	:	Mathematics-1, Mathematics-2
Instructor	:	Mathematics Teaching Staff
Aim of the course	:	The aim of the course is to teach the students the basic knowledge of engineering problems (linear equations) and to gain the ability to apply these methods.
Learning Outcomes	:	Students who successfully complete this course, 1) Can make collection and scalar multiplication on vectors. 2) Knows the properties of matrices, can work on matrices and matrix can take the opposite 3) Knows the properties of determinant and can perform operations related to matrices with the help of determinant. 4) Solve systems of linear equations by means of matrices. 5) Define vector spaces by defining vector spaces. 6) Knows the concepts of rank, linear independence and base. 7) Know the definition of linear transformation and understand whether a given function is a linear transformation. 8) Find and use eigenvalues and eigenvectors with linear transformations. 9) Knows and uses the concept of inner product space and orthogonality
Content	:	In this context, students will learn the concepts of linear equations, vectors, matrices, linear transformations and will be able to do engineering applications. In addition, by expressing the data scientifically, it will lead to disciplined and scientific thinking.

<table>
<tr><td>Course Book</td><td colspan="5">Uygulamalı Lineer Cebir

Bernard KOLMAN - David R.HILL
Çev. Ömer AKIN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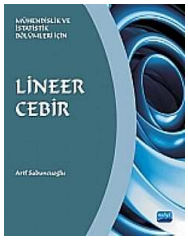
<tr><td>Other Sources</td><td colspan="3">Mühendislik ve İstatistik Bölümleri için Lineer Cebir,

Arif Sabuncuoğlu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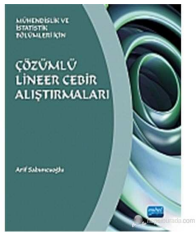
Arif Sabuncuoğlu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<tr><td>Assignments and Projects</td><td colspan="5"></td></tr>
<tr><td>Computer Usage</td><td colspan="5">Students can do their homework by using computer (not obligatory).</td></tr>
<tr><td>Other Applications</td><td colspan="5"></td></tr>
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<tr><td>Assigments</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Projects</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Term Paper/ Project</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Laboratory Applications</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Other Applications</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td colspan="2">Final Exam</td><td>50</td><td>1</td><td colspan="2">%60</td></tr>
<tr><td colspan="2">Make-up Exam</td><td>50</td><td>-</td><td colspan="2">100%</td></tr>
<tr><td colspan="2">Single Course / Extra Make-up Exam</td><td>50</td><td>-</td><td colspan="2">100%</td></tr>
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Nu.	Program Qualifications	Course Contribution Level				
		1	2	3	4	5
1	Define, model and solve science and math problems.			X		
2	Analyze the data, make experiments and design, has the ability to interpret the results.			X		
3	To be able to follow the latest developments in science and mathematics.			X		
4	Has the ability of logical and scientific thinking.				X	
5	Evaluates and analyzes the theoretical and practical knowledge gained in science and mathematics with a critical approach through scientific methods; develop solutions based on research for the solution of problems encountered.					X
6	Carries out any work in the field independently and takes responsibility as a team member when necessary.					X
7	To be able to relate science and mathematics to different disciplines and to establish Science and Mathematical models of problems in different disciplines					X
8	Expresses his / her knowledge and experiences and suggestions for solutions in the field in written and oral form within the framework of ethical rules.					X

COURSE QUALIFICATIONS AND COURSE RELATIONS								
Level of Contribution		**1**		**2**	**3**		**4**	**5**
		Very low		Low	Medium		High	Very high
All Departments								
	CR-1	**CR-2**	**CR-3**	**CR-4**	**CR-5**	**CR-6**	**CR-7**	**CR-8**
LC-1	3	3	1	2	3	3	3	
LC-2	3	3	1	2	3	3	3	
LC-3	3	3	1	2	3	3	3	
LC-4	4	3	1	2	3	3	3	
LC-5	3	4	1	2	2	2	2	
LC-6	2	2	1	1	2	2	2	
LC-7	2	2	1	2	2	2	2	
LC-8	3	3	1	2	2	3	2	
LC-9	2	2	1	2	2	2	2	

WEEKLY TOPICS		
Week	**TOPICS**	
	Theoritical	**Laboratory**
1	Introduction to vectors • Vectors in R^n space • The sum of the vectors, the scalar multiplication and the scalar multiplication	--
2	Matrix Algebra • Matrices • Sum of matrices, multiplication by scalar • Matrix transposition • Matrices and systems of linear equations	--
3	Matrix Algebra • Step mats, Elementary row operations • Matrix inverse, Similar matrices	--
4	determinants • Properties of determinants • Minors and cofactors, Adjoint matrix	--
5	determinants • Cramer method • Matrix inverse with the help of determinant	--
6	Linear Equation Systems Solutions • Gauss elimination method • Gauss-Jordan method	--
7	Vector Spaces and Subspaces • Vector space concept • Subspaces	--
8	Vector Spaces and Subspaces • Rank • Row and column space of a matrix • Linear combinations	--
9	Vector Spaces and Subspaces / Midterm Exam • Linear dependence and independence • Base and size	--
10	Midterm / Linear Transformations • Definition of linear transformation • Operations in linear transformations	--
11	Linear Transformations • Core and value zone • Determinant of linear transformation	--
12	Eigenvalues and Eigenvectors • Finding eigenvalues and eigenvectors	--
13	Eigenvalues and Eigenvectors • Diagonalization • Cayley-Hamilton theorem	--
14	Inner Product Spaces and Orthogonality • Inner product spaces • Cauchy-Schwartz inequality • Orthogonality	--
15	Inner Product Spaces and Orthogonality • Gram-Schmidt orthogonalization process • Applications	--

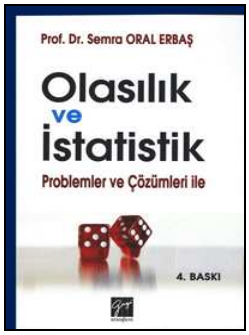
ECTS / TABLE OF WORKLOAD			
ACTIVITIES	**NUMBER**	**DURATIOM (HOUR)**	**ESTIMATED WORKLOAD (HOUR)**
Theoritical Course	14	3	42
General Laboratory Practice	--	--	--
Guided Problem Solving	14	2	28
Assignments and Report Submission	2	3	6
Term project	--	--	--
Project Presentation	--	--	--
Quiz	2	1	2
Midterm Exam	1	2	2
Individual Study for Midterm Exam	1	6	6
Final Exam	1	2	2
Individual Study for Final Exam	1	10	10
TOTAL WORKLOAD	98 Hours		
ECTS CREDIT OF THE COURSE	Total Workload/ 30 = 98/30 = 3,26		3 Credits

	TURKISH NAVAL ACADEMY **DEPARMENT OF BASIC SCIENCES** **COURSE CATALOGUE**	

Course Name	Code	Class/Semester	Duration (T+P)	Credit	ECTS
PROBABILITY AND STATISTICS	FEB-222	2/ 2.YY	3+0+0	3	3

Language of the course	:	Turkish
Level of the course	:	Bachelor's Degree
Prerequisite of the course	:	Mathematics-1, Mathematics-2
Instructor	:	Mathematics Teaching Staff
Aim of the course	:	The aim of probability and statistics course; The aim of this course is to provide the students with the basic concepts and principles related to the performance and analysis of engineering applications in the department of War-III and War-IV.
Learning Outcomes	:	Students who can successfully complete this course; 1) Associate basic concepts of statistics and probability concepts. 2) To be able to interpret statistical data sets by using numerical and graphical methods. 3) Acquire theoretical and practical knowledge about probabilistic problems. 4) To be able to make scientific prediction by using descriptive and inference. 5) Understands random variables and their distributions. 6) To be able to use random variable and continuous random variables and distributions. 7) Distinguish basic sampling distributions. 8) Be able to predict the relationship between universe and sample within the scope of the basic paradigm in Scientific Research Methods. 9) To learn to test the results obtained from the analysis with statistical hypothesis testing. 10) Can test hypotheses (statistical) parametric and non-parametric.
Content	:	In this context, students will be able to learn basic concepts and principles related to the performance and analysis of engineering applications.

<table>
<tr><td>Course Book</td><td>John E. FREUND’dan Matematiksel İstatistik

Irwin MILLER / Marylees MILLER (Çev. Ümit ŞENSES)
 
</td></tr>
<tr><td>Other Sources</td><td>Olasılık ve İstatistik
Prof. Semra Oral ERBAŞ
 
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<tr><td colspan="2">Mid term</td><td>50</td><td>1</td><td colspan="2">30%</td></tr>
<tr><td rowspan="6">Semester Evaluation</td><td>Quizes</td><td>50</td><td>1</td><td>%</td><td rowspan="6">10%</td></tr>
<tr><td>Assigments</td><td>50</td><td>1</td><td>%</td></tr>
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<tr><td>Term Paper/ Project</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Laboratory Applications</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Other Applications</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td colspan="2">Final Exam</td><td>50</td><td>1</td><td colspan="2">%60</td></tr>
<tr><td colspan="2">Make-up Exam</td><td>50</td><td>-</td><td colspan="2">100%</td></tr>
<tr><td colspan="2">Single Course / Extra Make-up Exam</td><td>50</td><td>-</td><td colspan="2">100%</td></tr>
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</td></tr>
</table>

Nu.	Program Qualifications	Course Contribution Level				
		1	2	3	4	5
1	Define, model and solve science and math problems.			X		
2	Analyze the data, make experiments and design, has the ability to interpret the results.			X		
3	To be able to follow the latest developments in science and mathematics.			X		
4	Has the ability of logical and scientific thinking.				X	
5	Evaluates and analyzes the theoretical and practical knowledge gained in science and mathematics with a critical approach through scientific methods; develop solutions based on research for the solution of problems encountered.					X
6	Carries out any work in the field independently and takes responsibility as a team member when necessary.					X
7	To be able to relate science and mathematics to different disciplines and to establish Science and Mathematical models of problems in different disciplines					X
8	Expresses his / her knowledge and experiences and suggestions for solutions in the field in written and oral form within the framework of ethical rules.					X

COURSE QUALIFICATIONS AND COURSE RELATIONS								
Level of Contribution		**1**	**2**	**3**		**4**	**5**	
		Very low	Low	Medium		High	Very high	
All Departments								
	CR-1	**CR-2**	**CR-3**	**CR-4**	**CR-5**	**CR-6**	**CR-7**	**CR-8**
LC-1	3	2	1	3	2	5	4	
LC-2	3	3	1	4	2	4	3	
LC-3	2	4	1	5	2	4	2	
LC-4	3	3	1	4	1	4	3	
LC-5	3	2	1	3	2	4	3	
LC-6	4	3	2	2	3	4	3	
LC-7	2	3	2	2	3	5	4	

WEEKLY TOPICS		
Week	**TOPICS**	
	Theoritical	**Laboratory**
1	Introduction to Statistics • Basic Concepts, Statistics, Population, Parameter, Sample Statistics • Variable and Variable Types, Measurement Levels • Editing Data and Graphics	--
2	Measures of Central Tendency and Distribution • Arithmetic Mean, Mod, Median and Cartridges, Harmonic Mean, Geometric Mean • Variability and Asymmetry Measures Change Range, Standard Deviation • Variance, Coefficient of Variation, Mean Absolute Deviation, Bowley and Pearson Asymmetry Measurements	--
3	Permutations, Combinations, Probability • Basic Rules of Counting, Permutation, Probability Theorems • Permutation, Probability Theorems • Dependent, Independent Events	--
4	Conditional Probability, Bayes Theorem • Bayes Theorem • Bayes' Rule • Conditional Probability	--
5	Random Variables and Types • Discrete, Continuous Chance Variables, Probability Function • Probability Density Function, Expected Value • Variance Concept Calculations, Moments	--
6	Discrete Probability Distributions • Uniform Distribution, Bernoulli Distribution • Binomial distribution • Poisson distribution	--
7	Some Discrete Probability Distributions • The Approach of Binomial Distribution to Poisson Distribution. • Hypetometric Distribution, Geometric Distribution, Negative Binomial (Pascal) Distribution • Probability Functions, Expected Value and Variances	--
8	MIDTERM	--
9	Continuous Probability Distributions • Exponential Distribution, Uniform Distribution, Gamma Distribution, Normal Distribution • Probability Density Functions • Expected Value and Variances	--
10	Approach to the Normal Distribution of Binomial and Poisson Distribution • Approach to the Normal Distribution of Binomial Distribution • Approach to the Normal Distribution of the Distribution of Poisson Distribution • Approach to the Normal Distribution of the Distribution of Poisson Distribution	--
11	Sampling and Sampling Distributions • Sampling Distribution of Sample Average, Sampling Distribution of Sample Ratio • Sampling Distribution of Sample Variance, Central Limit Theorem. • Student –T distribution, Chi - Square Distribution and F Distribution	--

12	Point Estimation, Range Estimation, Confidence Interval • Classic Estimation Method, Forecast Interval-Confidence Interval • Universe Average with a Sample, Rate • Confidence Interval for Variance	--
13	One and Two Sample Prediction Problems • Estimation of the Difference Between the Two-Samples and the Meanings of the Two Universes • Estimation of Variance Rates of Two Universes with Two Samples • Estimation of Variance Rates of Two Universes with Two Samples	--
14	Hypothesis Testing • Test for a variance with a sample • Test for the difference between the mean of two universes with a sample • Test on the difference between averages with two samples • Test of the difference between the proportions of the province and two samples	--
15	Non-parameter tests • Conformity testing • Independence and homogeneity tests • Various ratio tests	--

ECTS / TABLE OF WORKLOAD

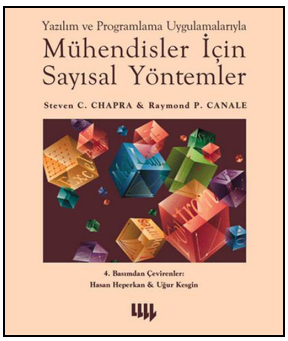
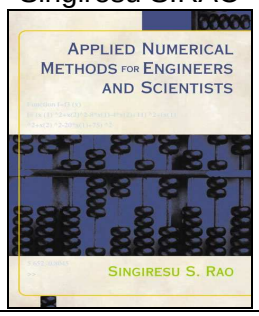
ACTIVITIES	**NUMBER**	**DURATIOM (HOUR)**	**ESTIMATED WORKLOAD (HOUR)**
Theoritical Course	14	3	42
General Laboratory Practice	--	--	--
Guided Problem Solving	14	2	28
Assignments and Report Submission	2	3	6
Term project	--	--	--
Project Presentation	--	--	--
Quiz	2	1	2
Midterm Exam	1	2	2
Individual Study for Midterm Exam	1	6	6
Final Exam	1	2	2
Individual Study for Final Exam	1	10	10
TOTAL WORKLOAD	98 Hours		
ECTS CREDIT OF THE COURSE	Total Workload / 30 = 98 / 30 = 3,26		3 Credits

	TURKISH NAVAL ACADEMY **DEPARMENT OF BASIC SCIENCES** **COURSE CATALOGUE**	

Course Name	Code	Class/Semester	Duration (T+P)	Credit	ECTS
NUMERICAL METHODS	FEB-311	3/ 1.YY	2+0+0	2	3

Language of the course	:	Turkish
Level of the course	:	Bachelor's Degree
Prerequisite of the course	:	Not
Instructor	:	Mathematics Teaching Staff
Aim of the course	:	The aim of this course is to teach the numerical methods used in solving engineering problems and to gain the ability of problem solving with computer.
Learning Outcomes	:	Students who can successfully complete this course; 1) Know the concept of error analysis and apply it in numerical calculations. 2) Find the roots of functions by using numerical methods. 3) Be able to solve linear equation systems by using numerical methods and be able to think about the structure of the system of linear equations. 4) To be able to derive the curve formula by using the set of given points and find the intermediate values with this function. 5) know the interpolation techniques and find a curve equation which passes through these points by using the given data points. 6) Know the concept of numerical integration and get the value of the integral using different numerical integration methods. 7) To be able to calculate numerical solutions of differential equations by using numerical derivative formulas with high accuracy. 8) solve ordinary differential equations and boundary value problems with different numerical methods. 9) Know the finite difference method, using this method, laplace equation, heat transfer equation, elliptic equations should be able to solve, apply to engineering problems.

Content	:	In this context, students will be able to learn the concepts of error analysis, finding function roots, linear equations systems, deriving the curve formula, interpolation techniques, numerical integration, ordinary differential equations and engineering applications. In addition, by expressing the data with scientific symbols, they will lead to disciplined and scientific thinking.

Course Book	Mühendisler için Sayısal Yöntemler Steven CHAPRA 
Other Sources	Applied Numerical Methods for Engineers and Scientists Singiresu S.RAO 
Assignments and Projects	
Computer Usage	Students can do their homework by using computer (not obligatory).
Other Applications	

Evaluation System	**Activities**		**Base Grade**	**Number**	**Contribution to Review, %**	
	Mid term		50	1	30%	
	Semester Evaluation	Quizes	50	1	%	10%
		Assigments	50	1	%	
		Projects	50	1	%	
		Term Paper/ Project	50	1	%	
		Laboratory Applications	50	1	%	
		Other Applications	50	1	%	
	Final Exam		50	1	%60	

	Make-up Exam	50	-	100%
	Single Course / Extra Make-up Exam	50	-	100%

Nu.	Program Qualifications	Course Contribution Level				
		1	2	3	4	5
1	Define, model and solve science and math problems.			X		
2	Analyze the data, make experiments and design, has the ability to interpret the results.			X		
3	To be able to follow the latest developments in science and mathematics.			X		
4	Has the ability of logical and scientific thinking.				X	
5	Evaluates and analyzes the theoretical and practical knowledge gained in science and mathematics with a critical approach through scientific methods; develop solutions based on research for the solution of problems encountered.					X
6	Carries out any work in the field independently and takes responsibility as a team member when necessary.					X
7	To be able to relate science and mathematics to different disciplines and to establish Science and Mathematical models of problems in different disciplines					X
8	Expresses his / her knowledge and experiences and suggestions for solutions in the field in written and oral form within the framework of ethical rules.					X

COURSE QUALIFICATIONS AND COURSE RELATIONS								
Level of Contribution		**1**	**2**	**3**		**4**		**5**
		Very low	Low	Medium		High		Very high
All Departments								
	CR-1	**CR-2**	**CR-3**	**CR-4**	**CR-5**	**CR-6**	**CR-7**	**CR-8**
LC-1	5	3	3	4	4	5	3	
LC-2	3	3	3	4	3	5	3	
LC-3	4	5	3	5	4	5	3	
LC-4	5	4	3	5	4	5	5	
LC-5	4	4	3	5	4	5	3	
LC-6	4	3	3	4	3	5	3	
LC-7	3	4	3	5	4	5	3	
LC-8	3	5	3	5	4	5	5	
LC-9	4	5	3	5	4	5	5	

WEEKLY TOPICS		
Week	**TOPICS**	
	Theoritical	**Laboratory**
1	ERROR ANALYSIS • Introduction to numerical methods, Approach and rounding errors • Cutting errors and Taylor series	--
2	ROOT FINDING METHODS • Primitive methods, Intermediate half-time • Displacement method, Application	--
3	ROOT FINDING METHODS • Fixed-point iteration, Newton-Raphson • Secant method	--
4	LINEAR EQUATIONS • Gauss-Jordan, LU decomposition, Matrix Inverse • Error Analysis and System condition	--
5	LINEAR EQUATIONS • Cholesky decomposition • Gauss-Seidel	--
6	CURVE FITTING • Least squares method, linear regression • Polynomial regression	--
7	MIDTERM	--
8	THE INTERPOLATION Newton's divided difference interpolation polynomials • Lagrance interpolation polynomials, cubic strip interpolation	--
9	NUMERICAL INTEGRATION • Newton Cotes Integral Formulas (Trapeze Method) • Newton Cotes Formulas (Simpson Methods)	--
10	NUMERICAL INTEGRATION • Romberg Integral • Gaussian frame	--
11	NUMERICAL DERIVATIVE • High accuracy differential formulas • Richardson extrapolation	--
12	ORDINARY DIFFERENTIAL EQUATIONS • Euler Method • Improvements to the Euler method	--
13	ORDINARY DIFFERENTIAL EQUATIONS • Runge-Kutta methods • Limit value and eigenvalue problems	--
14	PARTIAL DIFFERENTIAL EQUATIONS • Finite difference: Elliptic Equations • Laplace Equation	--
15	PARTIAL DIFFERENTIAL EQUATIONS • Finite difference: Parabolic equations, Heat conduction equation • Crank-Nicholson method	--
16	PARTIAL DIFFERENTIAL EQUATIONS • Finite difference: Parabolic equations, Heat conduction equation • Crank-Nicholson method	--

ECTS / TABLE OF WORKLOAD			
ACTIVITIES	**NUMBER**	**DURATIOM (HOUR)**	**ESTIMATED WORKLOAD (HOUR)**
Theoritical Course	15	2	30
General Laboratory Practice	--	--	--
Guided Problem Solving	15	2	30
Assignments and Report Submission	3	5	15
Term project	--	--	--
Project Presentation	--	--	--
Quiz	2	2	4
Midterm Exam	1	2	2
Individual Study for Midterm Exam	1	6	6
Final Exam	1	2	2
Individual Study for Final Exam	1	10	10
TOTAL WORKLOAD	99		
ECTS CREDIT OF THE COURSE	Total Workload /30 = 99 / 30 = 3,3		3 Credits

	TURKISH NAVAL ACADEMY **DEPARMENT OF BASIC SCIENCES** **COURSE CATALOGUE**	

Course Name	Code	Class/Semester	Duration (T+P)	Credit	ECTS
COMPLEX ANALYSIS	FM-311	3 / 1.YY	2+0+0	2	3

Language of the course	:	Turkish
Level of the course	:	Bachelor's Degree
Prerequisite of the course	:	Differential Equations
Instructor	:	Mathematics Teaching Staff
Aim of the course	:	To give the necessary information about the complex functions theory needed by the related branches and to create the required infrastructure.
Learning Outcomes	:	Students who can successfully complete this course; 1) To be able to do algebraic operations with complex numbers, to be able to write complex numbers in trigonometric and exponential form, to find the roots of complex numbers. 2) To be able to analyze single and multivalent functions, elementary complex variable functions, calculate the limits and derivatives of complex functions, apply Cauchy-Riemann equations in analytic functions. 3) To be able to recognize the integrals and properties of curvilinear, to compute the integral of the Cauchy-Goursat theorem, to comprehend the advantages of Cauchy Integral theorem 4) To be able to open a function to the Laurent and Taylor series, and to determine the types of unique points of complex functions. 5) To be able to determine polar points, to be able to comprehend the advantages of residual theorem and to calculate curvilinear integral problems with the help of residual theorem. 6) To be able to distinguish the real integrals by selecting the appropriate environment in the complex plane.
Content	:	In this context, students will be able to learn and apply the concepts of complex functions and complex integrals. In addition, by expressing the data with scientific symbols, they will lead them to think disciplinary and scientific.

<table>
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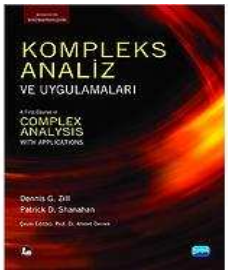
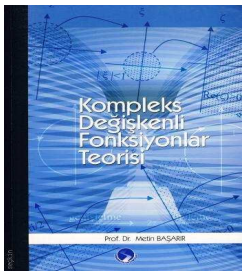
Dennis G. ZILL

  </td></tr>
<tr><td>Other Sources</td><td>Kompleks Değişkenli Fonksiyonlar Teorisi

Metin BAŞARIR

  </td></tr>
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<tr><td colspan="2">Mid term</td><td>50</td><td>1</td><td colspan="2">28%</td></tr>
<tr><td rowspan="6">Semester Evaluation</td><td>Quizes</td><td>50</td><td>1</td><td>%</td><td rowspan="6">12%</td></tr>
<tr><td>Assigments</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Projects</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Term Paper/ Project</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Laboratory Applications</td><td>50</td><td>1</td><td>%</td></tr>
<tr><td>Other Applications</td><td>50</td><td>1</td><td>%</td></tr>
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<tr><td colspan="2">Make-up Exam</td><td>50</td><td>-</td><td colspan="2">100%</td></tr>
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Nu.	Program Qualifications	Course Contribution Level				
		1	2	3	4	5
1	Define, model and solve science and math problems.			X		
2	Analyze the data, make experiments and design, has the ability to interpret the results.			X		
3	To be able to follow the latest developments in science and mathematics.			X		
4	Has the ability of logical and scientific thinking.				X	
5	Evaluates and analyzes the theoretical and practical knowledge gained in science and mathematics with a critical approach through scientific methods; develop solutions based on research for the solution of problems encountered.					X
6	Carries out any work in the field independently and takes responsibility as a team member when necessary.					X
7	To be able to relate science and mathematics to different disciplines and to establish Science and Mathematical models of problems in different disciplines					X
8	Expresses his / her knowledge and experiences and suggestions for solutions in the field in written and oral form within the framework of ethical rules.					X

COURSE QUALIFICATIONS AND COURSE RELATIONS

Level of Contribution	1	2	3	4	5
	Very low	Low	Medium	High	Very high

All Departments

	CR-1	CR-2	CR-3	CR-4	CR-5	CR-6	CR-7	CR-8
LC-1	5	3	1	2	2	3	3	
LC-2	3	3	1	3	5	4	4	
LC-3	5	3	1	4	5	5	3	
LC-4	3	2		3	3	4	3	
LC-5	5	3	1	3	4	5	3	
LC-6	3	3		4	3	3	3	

WEEKLY TOPICS		
Week	**TOPICS**	
	Theoritical	**Laboratory**
1	Complex Numbers • Complex numbers and properties • Polar display	--
2	Complex Numbers • Exponential notation • Forces and roots	--
3	Complex Variable Functions • Complex functions • Elementary functions	--
4	Complex Variable Functions • Limit • Derivatives	--
5	Complex Variable Functions • Cauchy Riemann equations	--
6	Complex Variable Functions • Analytical functions • Harmonic functions	--
7	Complex Integrals • Curvilinear integrals • Simple and closed curves	--
8	Complex Integrals • Cauchy-Gaursat theorem applications	--
9	Complex Integral / Midterm • Cauchy integral theorem • Cauchy integral theorem applications	--
10	Midterm Exam / Series • Taylor series expansion	--
11	Series • Laurent series expansion	--
12	Series • Classification of singular points	--
13	Residue Theorem and Applications • Residual theorem • Residue calculation	--
14	Residue Theorem and Applications • Integral calculation with the help of residues	--
15	Calculation of some true integrals with the help of residues • Real integrals including sine and cosine • Generalized integrals	--
16	Calculation of some true integrals with the help of residues • Real integrals including sine and cosine • Generalized integrals	--

ECTS / TABLE OF WORKLOAD			
ACTIVITIES	**NUMBER**	**DURATIOM (HOUR)**	**ESTIMATED WORKLOAD (HOUR)**
Theoritical Course	15	2	30
General Laboratory Practice	--	--	--
Guided Problem Solving	15	1	15
Assignments and Report Submission	2	4	8
Term project	--	--	--
Project Presentation	--	--	--
Quiz	2	2	4
Midterm Exam	1	3	3
Individual Study for Midterm Exam	1	5	5
Final Exam	1	5	5
Individual Study for Final Exam	1	10	10
TOTAL WORKLOAD	80		
ECTS CREDIT OF THE COURSE	Total Workload / 30 = 80 / 30 = 2,6		3 Credits