ANKARA BİLİM ÜNİVERSİTESİ

ENDÜSTRİ MÜHENDİSLİĞİ BÖLÜMÜ

MÜFREDAT EL KİTABI

ANKARA 2022

ANKARA BİLİM ÜNİVERSİTESİ

INDUSTRIAL ENGINEERING DEPARTMENT

CURRICULUM HANDBOOK

ANKARA 2022

Vizyon

Toplumun ve endüstrinin gereksinimleri doğrultusunda yetkin ve yenilikçi bilimsel araştırmalar gerçekleştiren, mükemmeliyetçi eğitim kalitesinin sürekliliği ile öncü bireyler yetiştiren ve uluslararası düzeyde kabul gören bir bölüm olmaktır.

Misyon

Analitik düşünme yeteneği gelişmiş, sorgulayabilen, yaratıcı, çözüm üreten, özgüveni yüksek, güçlü iletişim becerisine sahip, sorumluluklarının bilincinde ve saygın endüstri mühendisleri yetiştirmek; kendini sürekli geliştiren akademik kadrosuyla evrensel ölçütlerde özgün bilimsel araştırmalar yapmak ve uluslararası iş birliğinden güç alarak üstün kaliteli eğitim vermektir.

Vision

To be an internationally recognized department that conducts competent and innovative scientific research in line with the needs of society and industry trains pioneering individuals with the continuity of perfectionist education quality.

Mission

Develop respected industrial engineers with analytical thinking skills, who can question, who are creative, who produce solutions, who have high self-confidence, strong communication skills, and who are aware of their responsibilities; conduct original scientific research at universal standards with its constantly improving academic staff; and provide high-quality education through international cooperation.

ANKARA BİLİM ÜNİVERSİTESİ
ENDÜSTRİ MÜHENDİSLİĞİ BÖLÜMÜ
PROGRAM ÇIKTILARI (YETERLİLİKLERİMİZ)

1) Matematik, fen bilimleri ve Endüstri Mühendisliği ile ilgili mühendislik ve sosyal bilimler konularında yeterli bilgi birikimi; bu alanlardaki kuramsal ve uygulamalı bilgileri karmaşık Endüstri Mühendisliği problemlerinde kullanabilme becerisi.
2) Karmaşık mühendislik problemlerini saptama, tanımlama, formüle etme ve çözme becerisi; bu amaçla uygun analiz ve modelleme yöntemlerini seçme ve uygulama becerisi.
3) Karmaşık bir sistemi, süreci, cihazı veya ürünü gerçekçi kısıtlar ve koşullar altında, belirli gereksinimleri karşılayacak şekilde tasarlama becerisi; bu amaçla modern tasarım yöntemlerini uygulama becerisi. (Gerçekçi kısıtlar ve koşullar tasarımın niteliğine göre, ekonomi, çevre sorunları, sürdürülebilirlik, üretilebilirlik, etik, sağlık, güvenlik, sosyal ve politik sorunlar gibi öğeleri içerirler.)
4) Endüstri Mühendisliği uygulamalarında karşılaşılan karmaşık problemlerin analizi ve çözümü için gerekli modern teknikleri ve hesaplama araçlarını tasarlama, seçme ve kullanma becerisi; güncel donanım bilgileri ve özellikle Endüstri Mühendisliği ile ilgili yazılım olanakları ile bilgi teknolojilerini etkin bir biçimde kullanma becerisi.
5) Karmaşık Endüstri Mühendisliği problemlerinin veya Endüstri Mühendisliği araştırma konularının incelenmesi için deney tasarlama, deney yapma, veri toplama, sonuçları analiz etme ve yorumlama becerisi.
6) Disiplin içi ve çok disiplinli takımlarda etkin bir şekilde iş birliği yaparak verimli çalışabilme becerisi; bireysel çalışma becerisi.
7) Türkçe ve İngilizce sözlü ve yazılı etkin iletişim kurma becerisi; teknik resim, akış diyagramı gibi görsel araçları kullanma becerisi; etkin rapor yazma ve yazılı raporları anlama, tasarım ve üretim raporları hazırlayabilme, etkin sunum yapabilme, açık ve anlaşılır talimat verme ve alma becerisi.
8) Yaşam boyu öğrenmenin gerekliliği bilinci; bilgiye erişebilme (bilgiye erişebilme amacıyla kaynak araştırması yapma, veri tabanları ve diğer bilgi kaynaklarını kullanma becerisi), bilim ve teknolojideki gelişmeleri takip edebilme ve sürekli kişisel gelişimi sürdürebilme becerisi.
9) Etik ilkelerine uygun davranma, mesleki ve etik sorumluluk bilinci; mühendislik uygulamalarında kullanılan standartlar hakkında bilgi.
10) Proje yönetimi, risk yönetimi ve değişiklik yönetimi gibi, iş hayatındaki uygulamalar hakkında bilgi; girişimcilik, yenilikçilik hakkında farkındalık; sürdürülebilir kalkınma hakkında bilgi.
11) Mühendislik uygulamalarının evrensel ve toplumsal boyutlarda sağlık, çevre ve güvenlik üzerindeki etkileri ve çağın mühendislik alanına yansıyan sorunları hakkında bilgi; mühendislik çözümlerinin hukuksal sonuçları konusunda farkındalık.

ANKARA SCIENCE UNIVERSITY
INDUSTRIAL ENGINEERING DEPARTMENT
PROGRAM OUTPUTS

1) Adequate knowledge of mathematics, science and industrial engineering, engineering and social sciences; Ability to use theoretical and applied knowledge in these fields in complex Industrial Engineering problems.
2) Ability to identify, define, formulate and solve complex engineering problems; ability to select and apply appropriate analysis and modeling methods for this purpose.
3) Ability to design a complex system, process, device or product to meet specific requirements under realistic constraints and conditions; ability to apply modern design methods for this purpose. (Realistic constraints and conditions include elements such as economics, environmental issues, sustainability, manufacturability, ethical, health, safety, social and political issues, depending on the nature of the design.)
4) Ability to design, select and use modern techniques and computational tools necessary for the analysis and solution of complex problems encountered in Industrial Engineering applications; up-to-date hardware knowledge and especially software opportunities related to Industrial Engineering and the ability to use information technologies effectively.
5) Ability to design and conduct experiments, collect data, analyze and interpret results for the study of complex Industrial Engineering problems or Industrial Engineering research topics.
6) Ability to work efficiently by cooperating effectively in disciplinary and multi-disciplinary teams; individual working skills.
7) Ability to communicate effectively in Turkish and English, both orally and in writing; ability to use visual tools such as technical drawing, flowchart; ability to write effective reports and understand written reports, to prepare design and production reports, to make effective presentations, to give and receive clear and understandable instructions.
8) Awareness of the necessity of lifelong learning; the ability to access information (the ability to search for resources, use databases and other information resources to access information), the ability to follow the developments in science and technology and to maintain continuous personal development.
9) Behaving in accordance with ethical principles, awareness of professional and ethical responsibility; knowledge of standards used in engineering practice.
10) Knowledge of business practices such as project management, risk management and change management; awareness of entrepreneurship, innovation; information about sustainable development.
11) Information about the effects of engineering practices on health, environment and safety in universal and social dimensions and the problems of the age reflected in the field of engineering; awareness of the legal consequences of engineering solutions.

ENDÜSTRİ MÜHENDİSLİĞİ BÖLÜMÜ MÜFREDATI

2021

I. YARIYIL

Dersin Kodu	Dersin Adı	Öğretim Dili	Z/S	T	U	K	AKTS
OHS 101	Occupational Health and Safety I	İngilizce	Z	1	0	1	1
ENG 101	Academic English I	İngilizce	Z	2	0	2	2
MATH 101	Calculus I	İngilizce	Z	4	0	4	6
PHY 101	Physics I	İngilizce	Z	3	2	4	6
IE 101	Introduction to Industrial Engineering	İngilizce	Z	3	0	3	5
CENG 101	Algorithms and Programming with Java I	İngilizce	Z	3	2	4	6
HIS 101	Principles of Ataturk and History of Revolutions I	Türkçe	Z	2	0	2	2
TUR 101	Turkish I	Türkçe	Z	2	0	2	2
	Open Course I		S	0	0	0	0
Semester Credits				20	4	22	30

II. YARIYIL

Dersin Kodu	Dersin Adı	Öğretim Dili	Z/S	T	U	K	AKTS
OHS 102	Occupational Health and Safety II	İngilizce	Z	1	0	1	1
ENG 102	Academic English II	İngilizce	Z	2	0	2	2
MATH 102	Calculus II	İngilizce	Z	4	0	4	6
PHY 102	Physics II	İngilizce	Z	3	2	4	6
IE 112	Computer Aided Technical Drawing	İngilizce	Z	1	2	2	3
CENG 102	Algorithms and Programming with Java II	İngilizce	Z	3	4	5	8
HIS 102	Principles of Ataturk and History of Revolutions II	Türkçe	Z	2	0	2	2
TUR 102	Turkish II	Türkçe	Z	2	0	2	2
	Open Course II		S	0	0	0	0
Semester Credits				18	8	22	30

III. YARIYIL

Dersin Kodu	Dersin Adı	Öğretim Dili	Z/S	T	U	K	AKTS
IE 241	Engineering Economy	İngilizce	Z	3	0	3	5
IE 227	Probability Theory	İngilizce	Z	3	0	3	5
IE 223	Materials Science	İngilizce	Z	3	0	3	5
MATH 213	Linear Algebra	İngilizce	Z	3	0	3	5
MATH 215	Differential Equations	İngilizce	Z	3	0	3	5
ENG 201	Academic English III	İngilizce	Z	2	0	2	2
	Non-Departmental Elective I	İngilizce	S	3	0	3	3
Semester Credits				20	0	20	30

IV. YARIYIL

Dersin Kodu	Dersin Adı	Öğretim Dili	Z/S	T	U	K	AKTS
IE 202	Work Study and Ergonomics	İngilizce	Z	3	0	3	5
IE 224	Manufacturing Processes	İngilizce	Z	3	0	3	5
IE 228	Engineering Statistics	İngilizce	Z	3	0	3	5
IE 232	Operations Research I	İngilizce	Z	3	0	3	5
IE 242	Cost Analysis in Engineering	İngilizce	Z	3	0	3	5
ENG 202	Academic English IV	İngilizce	Z	2	0	2	2
	Non-Departmental Elective II	İngilizce	S	3	0	3	3
Semester Credits				20	0	20	30

V. YARIYIL

Dersin Kodu	Dersin Adı	Öğretim Dili	Z/S	T	U	K	AKTS
IE 301	Facilities Planning	İngilizce	Z	3	0	3	5
IE 333	Operations Research II	İngilizce	Z	3	0	3	5
IE 327	System Simulation	İngilizce	Z	3	0	3	5
IE 365	Production Planning and Control I	İngilizce	Z	3	0	3	5
IE 325	Quality Engineering	İngilizce	Z	3	0	3	5
ENG 301	Academic English V	İngilizce	Z	2	0	2	2
	Non-Departmental Elective III	İngilizce	S	3	0	3	3
Semester Credits				20	0	20	30

VI. YARIYIL

Dersin Kodu	Dersin Adı	Öğretim Dili	Z/S	T	U	K	AKTS
IE 324	Project Management	İngilizce	Z	3	0	3	3
IE 366	Production Planning and Control II	İngilizce	Z	3	0	3	5
IE 346	Decision Analysis	İngilizce	Z	3	0	3	5
ENG 302	Academic English VI	İngilizce	Z	2	0	2	2
	Technical Elective I	İngilizce	S	3	0	3	5
	Technical Elective II	İngilizce	S	3	0	3	5
	Technical Elective III	İngilizce	S	3	0	3	5
Semester Credits				20	0	20	30

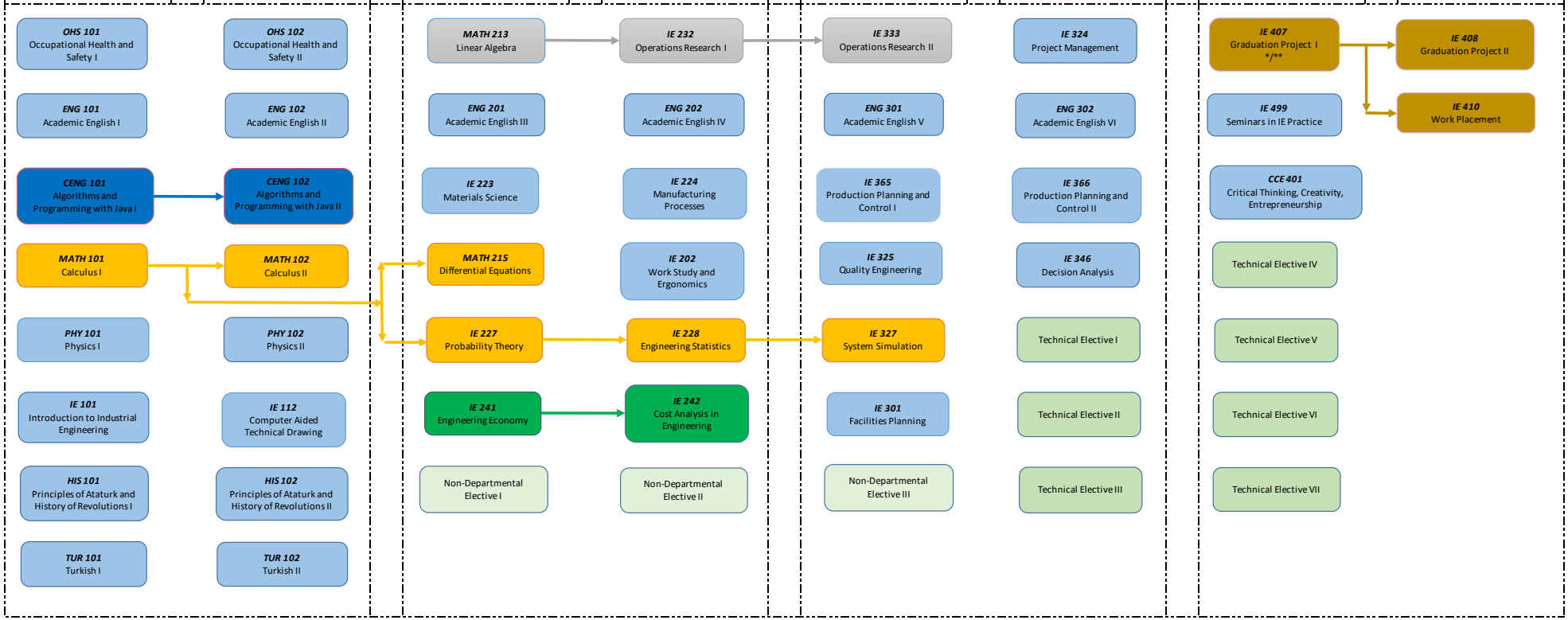
VII. YARIYIL

Dersin Kodu	Dersin Adı	Öğretim Dili	Z/S	T	U	K	AKTS
IE 407	Graduation Project I	İngilizce	Z	3	2	4	5
IE 499	Seminars in IE Practice	İngilizce	Z	2	0	2	3
CCE 401	Critical Thinking, Creativity, Entrepreneurship	İngilizce	Z	2	0	2	2
	Technical Elective IV	İngilizce	S	3	0	3	5
	Technical Elective V	İngilizce	S	3	0	3	5
	Technical Elective VI	İngilizce	S	3	0	3	5
	Technical Elective VII	İngilizce	S	3	0	3	5
Semester Credits				19	2	20	30

VIII. YARIYIL

Dersin Kodu	Dersin Adı	Öğretim Dili	Z/S	T	U	K	AKTS
IE 408	Graduation Project II	İngilizce	Z	3	2	4	5
IE 410	Work Placement	İngilizce	Z	0	16	8	25
Semester Credits				3	18	12	30

Industrial Engineering Undergraduate Curriculum Prerequisite Diagram for 2020-2021 Curriculum



*		Aşağıdaki derslerin en az dördünden asgari DD harf notu almış olmak.
1	IE232	Operations Research I
2	IE228	Engineering Statistics
3	IE301	Facilities Planning
4	IE202	Work Study and Ergonomics
5	IE365	Production Planning and Control I
6	IE327	System Simulation
7	IE325	Quality Engineering

**		Aşağıdaki derslerden asgari DD harf notu almış olmak.
1	MATH101	Calculus I
2	MATH102	Calculus II
3	PHY101	Physics I
4	PHY102	Physics II
5	CENG101	Algorithms and Programming with Java I
6	CENG102	Algorithms and Programming with Java II

***		**Mezuniyet Koşulu:** En az iki Zihni Mülkiyet dersi almış olmak
1	Non-Credit	Open Course I
2	Non-Credit	Open Course II

ANKARA SCIENCE UNIVERSITY
FACULTY OF ENGINEERING AND ARCHITECTURE
INDUSTRIAL ENGINEERING DEPARTMENT
COURSE INFORMATION

Course Name	Code	Semester	Theory (hours/week)	Application (hours/week)	Laboratory (hours/week)	National Credit	ECTS
Introduction to Industrial Engineering	IE101	Fall	3	0	0	3	5
Prerequisites	None						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery (face to face, distance learning)	Face to face/Distance Learning/Hybrid						
Learning and teaching strategies	Lecturing, discussion, questioning and answering.						
Instructor (s)	Dr. Çiğdem Sıcakyüz						
Course objective	To provide an overview of Industrial Engineering and its main concepts						
Learning outcomes	After taking this course, students will be able to; Have the knowledge about the history and future of Industrial Engineering Understand the main concepts of Industrial Engineering Comprehend the roles of Industrial Engineer in an organization through supply chain management Differ the Industrial Engineering from the other Engineering disciplines Comprehend the relationship between Industrial Engineering and other disciplines Describe the service and production systems Analyse a given system with its components, as well as define its input and output Have an overview of the importance of the management and team in an organization Describe a problem and develop the solving strategies a means of the models and simulations Have awareness of the importance of customers						
Course Content	History and task of Industrial Engineering, Its Main Disciplines, Production and Service Systems, Work Analysis and Measurement, Production Planning, Used Analytic Methods in the Industrial Engineering, Productivity and Need of Change.						
References	Some handouts will be given by lecturer and related articles to be discussed in the class will be found by the students						

Subjects by weeks

Weeks	Subjects
1. Week	An Introduction to academic rules and regulations, Introduction to Industrial Engineering lecture
2. Week	Fundamentals and Historical Development of Industrial Engineering
3. Week	Organizations and Feasibility Study
4. Week	Supply Chain and Operations Management
5. Week	Process Analysis
6. Week	Productivity, Cost Accounting and Activity-Based Costing, Performance Management
7. Week	Midterm Exam
8. Week	Work Study
9. Week	Continuous Improvement (Kaizen) and Quality Management
10. Week	Feasibility Study, Facility Planning and Layout, Manufacturing Systems,
11. Week	Production Planning and Control
12. Week	Human Resources Management and Allowances
13. Week	Simulation and Modelling, and Operation Research
14. Week	Preparation for final exam
15. Week	Final exam

Form vb (English): Assessment Method

Semester Works	Number	Contribution
Attendance	14	%0
Laboratory	0	%0
Application	0	%0
Fieldwork	0	%0
Practice	0	%0
Homework Assessment	2	%20
Presentation	0	%0
Project	0	%0
Seminar	0	%0
Mid-term Exams	1	%35
Final Exam	1	%45
Total	18	%100
Contribution of semester Works to success points	17	%65
Contribution of final exam to success points	1	%35
Total	18	%100

Form VIb (English): WORKLOAD AND ECTS CALCULATION

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory			
Application			
Specific practical training			
Field activities			
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	18	5	90
Presentation / Seminar Preparation			
Project			
Homework assignment	2	5	10
Midterms (Study duration)	1	2	2
Final Exam (Study duration)	1	2	2
Total Workload			146
Total Workload/30 hours			4,87
ECTS			5.00

Form VIIb (English): THE COURSE LEARNING OUTCOMES - PROGRAM OUTCOMES MATRIX

Program Outcomes	Contribution Level*				
	1	2	3	4	5
1					X
2				X	
3				X	
4			X		
5		X			
6					X
7			X		
8					X
9					X
10				X	
11				X	

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

ANKARA SCIENCE UNIVERSITY
FACULTY OF ENGINEERING AND ARCHITECTURE
INDUSTRIAL ENGINEERING DEPARTMENT
COURSE INFORMATION

Course Name	Code	Semester	Theory (hours/ week)	Application (hours/ week)	Laboratory (hours/ week)	National Credit	ECTS
Computer Aided Technical Drawing	IE112	Spring	1		2	2	3
Prerequisites	None						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery	Face to face/Distance Learning/Hybrid						
Learning and teaching strategies	Lecturing, discussion and submission, application						
Instructor (s)	Dr. Özgür Erol						
Course objective	to introduce students the basic concepts and the use of engineering drawing in the design and manufacturing field. To give basic knowledge and skills in engineering drawings and the capability to read and interpret blue prints for manufacturing. To let the students, develop 2D and 3D computer aided drafting to their work.						
Course Content							
References	1. Mastering Autodesk Inventor 2015 and Autodesk Inventor LT 2015: Autodesk Official Press, Curtis Waguespack, ISBN: 978-1-118-86213-1 2. Engineering Drawing and Graphic Technology-International Edition, Thomas E. French, Charles J. Vierck, Robert J. Foster, McGraw-Hill, Inc.1993 ISBN 0-07-022347-5 3. Engineering Drawing and Design-Sixth Edition, C. Jensen, J.D. Helsel, D.R. Short, McGraw-Hill, 2002, ISBN 0-07-821343-6 (T 353 J47 2002) 4. Technical Drawing-Fourteenth Edition, F. E. Giesecke, A. Mitchell, H. C. Spencer, I.L. Hill, J.T. Dygdon, J.E., Novak, Prentice-Hall, Inc., 2012, ISBN 0-13-178446-3 (T 353 T43 2003) 5. Mechanical Engineering Drawing-Self Taught, Jashua Rose, http://www.gutenberg.org/files/23319/23319-h/23319-h.htm						
Learning outcomes	After taking this course students will be able to; 1. Use computers at the education to help them visualize engineering components. 2. design shapes that suited the purpose and manufacturing methods						

Form IVb (English): Subjects by weeks

Weeks	Subjects
1. Week	Introduction to Graphics Communication
2. Week	Sketching
3. Week	Engineering Geometry
4. Week	Modeling Fundamentals
5. Week	Improvement algorithms,
6. Week	Multiview's and Visualization
7. Week	Midterm exam
8. Week	Auxiliary Views
9. Week	Auxiliary Views
10. Week	Pictorial Projections
11. Week	Section Views
12. Week	Dimensioning and Tolerancing Practices
13. Week	Working Drawings and Assemblies
14. Week	Working Drawings and Assemblies
15. Week	Final Exam

Form Vb (İngilizce): Assessment Method

Semester Works	Number	Contribution
Attendance	14	%0
Laboratory	0	%0
Application	14	%0
Fieldwork	0	%0
Practice	0	%0
Homework Assessment	0	%0
Presentation	0	%0
Project	1	%15
Seminar	0	%0
Mid-term Exams	2	%35
Final Exam	1	%50
Total	32	%100
Contribution of semester Works to success points	31	%50
Contribution of final exam to success points	1	%50
Total	32	%100

Form VIb (English): WORKLOAD AND ECTS CALCULATION

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	1	14
Laboratory			
Application			
Specific practical training			
Field activities			
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	2	28
Presentation / Seminar Preparation			
Project	1	10	16
Homework assignment	14	2	28
Midterms (Study duration)	1	2	2
Final Exam (Study duration)	1	2	2
Total Workload			90
Total Workload/30 hours			3,00
ECTS			3,00

Form VIIb (English): THE COURSE LEARNING OUTCOMES - PROGRAM OUTCOMES MATRIX

Program Outcomes	Contribution Level*				
	1	2	3	4	5
1			X		
2			X		
3			X		
4				X	
5		X			
6			X		
7				X	
8		X			
9		X			
10		X			
11		X			

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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COURSE INFORMATION

Course Name	Code	Semester	Theory (hours/ week)	Application (hours/ week)	Laboratory (hours/ week)	National Credit	ECTS
Work Study and Ergonomics	IE 202	Spring	3	0	0	3	5
Prerequisites	None						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery	Face to face/Distance Learning/Hybrid						
Learning and teaching strategies	Lecturing, discussion and submission, presentation.						
Instructor (s)	Çiğdem Sıcakyüz, PhD						
Course objective	To provide basic understanding about the concept and significance of work study and ergonomics. To understand about various techniques of work-study for improving the productivity of an organisation. To gain the ability for analysing and improving existing methods of working on processes. To provide the knowledge to the students about various wages and incentives schemes. To inculcate analysing skills related to work place design, working postures and lifting tasks To have the knowledge about assessment about occupational exposure to heat stress, noise, vibrations.						
Course Content	Productivitiy, Work measurement, Ergonomics						
References	1. Barnes Ralph M., "Motion & Time study: Design and Measurement of Work", Wiley Text Books, 2001. 2. Marvin E, Mundel & David L, "Motion & Time Study: Improving Productivity", Pearson Education,2000. 3. Benjamin E Niebel and Freivalds Andris, "Methods Standards & Work Design", Mc Graw Hill, 1997. 4. International Labour organization, "Work-study", Oxford and IBH publishing company Pvt. Ltd., N.Delhi, 2001. 5. Sanders Mark S and McCormick Ernert J, "Human Factors in Engineering and Design", McGraw-Hill Inc., 1993.						
Learning outcomes	After taking this course students will be able to; 1. Understand productivity measurement techniques and the effect of a range of improvement methods 2. Understand the features of work measurement and method study techniques 3. Be able to assess the ergonomic and layout planning features of workstation and manufacturing operations design 4. Be able to select and apply appropriate industrial engineering techniques to a given engineering/manufacturing situation.						

Form IVb (English): Subjects by weeks

Weeks	Subjects
1. Week	Productivity
2. Week	Human factor in work-study
3. Week	Method-study
4. Week	Work-Measurement
5. Week	Introduction, history of development,
6. Week	Man-machine system and its components.
7. Week	Mid- term exam
8. Week	Introduction to structure of the body- features of the human body, stress and strain, metabolism, measure of physiological functions- workload and energy consumption, biomechanics, types of movements of body members, strength and endurance, speed of movements.
9. Week	NIOSH lifting equation, Lifting Index, Maximum acceptable Weights and Forces, Distal upper extremities risk factors, Strain Index, RULA, REBA.
10. Week	Applied anthropometry - types, use, principles in application, design of work surfaces and seat design.
11. Week	Visual displays for static information, visual displays of dynamic information, auditory, tactual and olfactory displays and controls..
12. Week	Assessment of occupational exposure to noise, heat stress and dust.
13. Week	Effect of vibration/ noise, temperature, illumination and dust on human health and performance
14. Week	Application of Work Measurement
15. Week	Case studies in WorkStudy (The students may be asked to select a case study and presentation)
16. Week	Final Exam

Form Vb (English): Assessment Method

Semester Works	Number	Contribution
Attendance	14	%0
Laboratory	6	%0
Application	2	%0
Fieldwork	0	%0
Practice	0	%0
Homework Assessment	0	%0
Presentation	10	%0
Project	1	%20
Seminar	0	%0
Mid-term Exams	2	%40
Final Exam	1	%40
Total	36	%100
Contribution of semester Works to success points	35	%60
Contribution of final exam to success points	1	%40
Total	36	%100

Form VIb (English): WORKLOAD AND ECTS CALCULATION

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42

Laboratory	10	1	10
Application	2	10	20
Specific practical training			
Field activities			
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	8	4	32
Presentation / Seminar Preparation	2	5	8
Project	1	10	10
Homework assignment	12	3	36
Midterms (Study duration)	2	2	4
Final Exam (Study duration)	2	2	4
Total Workload			126
Total Workload/30 hours			4,2
ECTS			5.00

Form VIIb (English): THE COURSE LEARNING OUTCOMES - PROGRAM OUTCOMES MATRIX

Program Outcomes	**Contribution Level***				
	1	2	3	4	5
1					X
2				X	
3				X	
4			X		
5					X
6					X
7		X			
8					X
9			X		
10			X		
11					X

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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COURSE INFORMATION

Course Name	Code	Semester	Theory (hours/week)	Application (hours/week)	Laboratory (hours/week)	National Credit	ECTS
Materials Science	IE 223	Fall	3	0	0	3	5
Prerequisites	None						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery	Face to face/Distance Learning/Hybrid						
Learning and teaching strategies	Lecturing, discussion, self-study, homeworks, quizzes, Problem solving, literature search and presentation						
Instructor (s)	Ayşe ÖZDEMİR, PhD						
Course objective	The purpose of this course is to provide direct insight into the theoretical principles of materials science, basic properties of materials and usage of phase diagrams in engineering.						
Course Content	Classification of materials, The basics of atomic structure, Interaction between atomic arrangement and material properties, Defects and movements in materials, What the mechanical properties of materials, Phase diagrams, Alloys, Ceramics, Polymers.						
References	1. William D. Callister, Jr., William D. Callister , Fundamentals of materials science and engineering, Wiley (2001) 2. Donald R. Askeland, Pradeep P. Fulay, Wendelin J. Wright - The Science and Engineering of Materials, Sixth Edition -CL-Engineering (2010)						
Learning outcomes	After taking this course students will be able to; 1. know basic properties of materials 2. gain knowledge about the subjects, metals, alloys, ceramics, polymers and phase diagrams. 3. select suitable material for their research interest 4. understand the relationship between material structure and function.						

Form IVb (English): Subjects by weeks

Weeks	Subjects
1. Week	Introduction to material science, classification of materials based on function and structure
2. Week	The basics of atomic structure Interaction between atomic arrangement and material properties
3. Week	Atomic and ionic arrangaments and crystal structure analysis
4. Week	Defects and movements in materials
5. Week	Mechanical properties of materials
6. Week	Mechanical properties of materials
7. Week	Mid- term exam
8. Week	Solidification
9. Week	Phase diagrams
10. Week	Phase diagrams
11. Week	Heat treatment of materials
12. Week	Alloys
13. Week	Ceramic materials
14. Week	Polymers
15. Week	Presentations
16. Week	Final Exam

Form Vb (İngilizce): Assessment Method

Semester Works	Number	Contribution
Attendance	14	0%
Laboratory	0	0%
Application	0	0%
Fieldwork	0	0%
Practice	0	0%
Quizz	4	10%
Homework Assessment	10	10%
Presentation	1	20%
Project	0	0%
Seminar	0	0%
Mid-term Exams	1	25%
Final Exam	1	35%
Total	31	100%
Contribution of semester Works to success points	30	65%
Contribution of final exam to success points	1	35%
Total	31	100%

Form VIb (English): WORKLOAD AND ECTS CALCULATION

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory			
Application			
Specific practical training			
Field activities			
Quizz	4	2	8
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	20	2	40
Presentation / Seminar Preparation	1	10	10
Project			
Homework assignment	10	3	30
Midterms (Study duration)	1	10	10
Final Exam (Study duration)	1	10	10
Total Workload			150
Total Workload/30 hours			5
ECTS			5.00

Form VIIb (English): THE COURSE LEARNING OUTCOMES - PROGRAM OUTCOMES MATRIX

Program Outcomes	Contribution Level*				
	1	2	3	4	5
1			X		
2					X
3			X		
4				X	
5			X		
6			X		
7					X
8		X			
9		X			
10			X		
11			X		

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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COURSE INFORMATION

Course Name	Code	Semester	Theory (hours/ week)	Application (hours/ week)	Laboratory (hours/ week)	National Credit	ECTS
Manufacturing Processes	IE 224	Spring	3	0	0	3	5
Prerequisites	None						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery (face to face, distance learning)	Face to face						
Learning and teaching strategies	Lecturing, discussion and submission.						
Instructor (s)	Taner ALTUNOK, PhD						
Course objective							
Course Content							
References	1. Mikell P. Groover Fundamentals of Modern Manufacturing Materials, Processes and Systems- Third Edition John Wiley&Sons Inc. 2007 2. Serope Kalpakjian and Steven R. Schmid Manufacturing Engineering and Technology (Fifth Edition) Prentice-Hall, Inc. 2006 0-13-148965-8 3. William O.Fellers-William W. Hunt Manufacturing Processes for Technology Prentice-Hall, Inc. 2001 0-13-017791-1 4. E.Paul DeGarmo, J.T. Black and Ronald A. Kohser Materials and Processes in Manufacturing John Wiley & Sons, Inc. 1999 5. Jon Stenerson and Kelly Curran Computer Numerical Control Prentice-Hall, Inc. 2007 0-13-111547							
Learning outcomes	After taking this course students will be able to; 1. Investigate pre-manufacturing supply chain processes 2. Review processes used to manufacture products 3. Define manufacturing systems by product type 4. Describe the post-manufacturing supply chain process						

Subjects by weeks

Weeks	**Subjects**
1. Week	Introduction to Manufacturing Systems
2. Week	Fundamentals of Solidification Processes
3. Week	Solidification Processes: Expandable Mold Casting and Permanent Mold Casting
4. Week	Powder Metallurgy
5. Week	Fundamentals of Forming
6. Week	Forming Processes: Rolling, Forging, Extrusion
7. Week	Forming Processes: Wire Drawing, Bar Drawing, Sheet Metal Working
8. Week	Midterm Exam
9. Week	Theory of Material Removal Processes
10. Week	Material Removal Processes: Turning, Drilling, Milling
11. Week	Material Removal Processes: Turning, Drilling, Milling
12. Week	Machine Tools, Cutting Tools
13. Week	Machine Tools, Cutting Tools
14. Week	Joining Processes, Welding and Mechanical Fastening
15. Week	Metrology, Dimension, Allowance, Tolerance, Measurement Instruments
16. Week	Final Exam

Assessment Method

Semester Works	Number	Contribution
Attendance	14	0%
Laboratory	0	0%
Application	8	0%
Fieldwork	0	0%
Practice	0	0%
Homework Assessment	1	5%
Quiz	5	15%
Presentation	0	0%
Project	0	0%
Seminar	0	0%
Mid-term Exams	1	35%
Final Exam	1	45%
Total	30	100%
Contribution of semester Works to success points	29	55%
Contribution of final exam to success points	1	45%
Total	30	100%

Workload and ECTS Calculation

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory	0	0	0
Application	0	0	0
Specific practical training	0	0	0
Field activities	0	0	0
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	5	70
Presentation / Seminar Preparation	0	0	0
Project	0	0	0
Homework assignment	1	3	3
Quiz	5	3	15
Midterms (Study duration)	1	10	10
Final Exam (Study duration)	1	10	10
Total Workload	150		
Total Workload/30 hours	5		
ECTS	5		

Program Learning Outcomes - Course Learning Outcomes Matrix

Program Learning Outcomes	Course Learning Outcomes				
	LO1	LO2	LO3	LO4	LO5
PO-1	X				
PO-2					
PO-3		x			
PO-4				X	
PO-5			x		
PO-6					
PO-7					x
PO-8					
PO-9					
PO-10					
PO-11					

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COURSE INFORMATION

Course Name	Code	Semester	Theory (hours/week)	Application (hours/week)	Laboratory (hours/week)	National Credit	ECTS
Probability Theory	IE 227	Fall	3	0	0	3	5
Prerequisites	MATH 101 Calculus						
Course Language	English						
Course Type	Compulsory						
Mode of	Face to face/Distance Learning/Hybrid						
Learning and teaching strategies	Lecturing, discussion and submission.						
Instructor (s)	Dr. H. Umut AKIN						
Course objective	In this course, the students will be learning fundamental concepts of the probability so that they can solve practical problems of engineering which requires the knowledge of probability theory.						
Course Content	The role of Statistics in Engineering, Probability, Random variables, Expected value and variance of a random variable, Discrete and Continuous Probability Distributions, Joint probability distributions, Functions of Random Variables, Sampling Distributions and Central Limit Theorem						
References	1. Walpole, R. E., Myers, R. H., Myers S. L., Ye, K. "Probability and Statistics for Engineers and Scientists" (9th edition) 2. Montgomery, D. C., Runger, G. C., "Applied Statistics and Probability for Engineers" 3. Ross, S. M., "Introduction to Probability Models"						
Learning outcomes	1. Learn the basic concepts such as conditional probability, independence, expectation and variation 2. Apply and interpret theorems such as total probability rule, Bayes' theorem, the conditional expectation and the central limit theorem 3. Know when to use discrete and continuous distributions 4. Model sources of uncertainty associated with industrial and systems engineering problems 5. Analyze and interpret the results of the probabilistic models by using probability theory.						

Form IVb (English): Subjects by weeks

Weeks	Subjects
1. Week	The role of probability, statistics and data analysis in engineering.
2. Week	Sample space, Events, Counting
3. Week	Probability of an event, 3 Axioms of probability
4. Week	Conditional probability, Independence, Bayes' Rule
5. Week	Random variables and Discrete and Continuous probability distributions
6. Week	Joint probability distributions
7. Week	Mathematical expectation, Mean, Variance
8. Week	Midterm Exam
9. Week	Covariance and Correlation of random variables
10. Week	Some discrete probability distributions
11. Week	Some continuous probability distributions
12. Week	Functions of random variables
13. Week	Sampling Distributions
14. Week	Central limit theorem
15. Week	Final Exam

Form Vb (İngilizce): Assessment Method

Semester Works	Number	Contribution
Attendance	14	%10
Laboratory	0	%0
Application	4	%20
Fieldwork	0	%0
Practice	0	%0
Homework Assessment	0	%0
Presentation	0	%0
Project	0	%0
Seminar	0	%0
Mid-term Exams	1	%30
Final Exam	1	%40
Total	20	%100
Contribution of semester Works to success points	19	%60
Contribution of final exam to success points	1	%40
Total	20	%100

Form VIb (English): WORKLOAD AND ECTS CALCULATION

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory			
Application	4	3	12
Specific practical training			
Field activities			
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	5	70
Presentation / Seminar Preparation			
Project			
Homework assignment			
Midterms (Study duration)	1	5	5
Final Exam (Study duration)	1	8	8
Total Workload			137
Total Workload/30 hours			4.56
ECTS			5.00

Form VIIb (English): THE COURSE LEARNING OUTCOMES - PROGRAM OUTCOMES MATRIX

Program Outcomes	Course Outcomes				
	1	2	3	4	5
1	5	5	5	5	5
2	3	3		3	3
3					3
4	3	3	3	3	3
5					
6				2	2
7					2
8					
9					
10					
11					

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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Course Name	Code	Semester	Theory (hours/ week)	Application (hours/ week)	Laboratory (hours/ week)	National Credit	ECTS
Engineering Statistics	IE 228	Spring	3	0	0	3	5
Prerequisites	IE 227 Probability Theory						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery	Face to face/Distance Learning/Hybrid						
Learning and teaching strategies	Lecturing, discussion and presentation.						
Instructor (s)	Çiğdem Sıcakyüz, PhD						
Course objective	To teach basics of information of engineering statistics						
Course Content	Introduction, Probability, Some Elementary Theorems, Probability Distributions, Probability Densities, Treatment of Data, Sampling Distributions, Estimating of Parameters, Nonparametric Tests, Regression Analysis						
References	1. Jay L.Devore, "Probability and statistics for Engineering and the Sciences", 5th Edition,Thomson and Duxbury, Singapore, 2002. 2. Murray.R. SpiegelandLarry J.Stephens, "Schaum'sou Tlines- Statistics", Third Edition, Tata McGraw-Hill, 2000. 3. R.A.Johnson and C.B.Gupta, "Miller & Freund's Probability and Statistics for Engineers",Pearson Education, Asia, 7th Edition, 2007. 4. Richard A.Johnson and Dean W.Wichern, "Applied Multivariate Statistical Analysis", PearsonEducation, Asia, 6th Edition, 2007.						
Learning outcomes	After taking this course students will be able to; 1. understand the basic of statistics 2. comprehend the probability distributions 3. conduct a hypothesis test 4. inference concerning the parameters 5. use the data in the given system						

Form IVb (English): Subjects by weeks

Weeks	Subjects
1. Week	Introduction to Statistics and Engineering
2. Week	Probability
3. Week	Probability Distributions
4. Week	Probability Distributions
5. Week	Probability Densities
6. Week	Probability Densities
7. Week	Mid- term exam
8. Week	Treatment of Data
9. Week	Treatment of Data
10. Week	Sampling Distributions
11. Week	Estimating of Parameters
12. Week	Estimating of Parameters
13. Week	Nonparametric Tests
14. Week	Nonparametric Tests
15. Week	Regression Analysis
16. Week	Final Exam

Form Vb (English): Assessment Method

Semester Works	Number	Contribution
Attendance	14	%0
Laboratory	0	%0
Application	0	%0
Fieldwork	0	%0
Practice	0	%0
Homework Assessment	0	%0
Presentation	5	%0
Project	0	%0
Seminar	0	%0
Mid-term Exams	2	%25
Final Exam	1	%50
Total	30	%100
Contribution of semester works to success points	29	%50
Contribution of final exam to success points	1	%50
Total	30	%100

Form VIb (English): WORKLOAD AND ECTS CALCULATION

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory			
Application			
Specific practical training			
Field activities			
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	5	70
Presentation / Seminar Preparation			
Project			
Homework assignment	14	2	28
Midterms (Study duration)	2	2	4
Final Exam (Study duration)	1	2	2
Total Workload			146
Total Workload/30 hours			4.86
ECTS			5.00

Form VIIb (English): THE COURSE LEARNING OUTCOMES - PROGRAM OUTCOMES MATRIX

Program Outcomes	Contribution Level*				
	1	2	3	4	5
1				X	
2					X
3			X		
4					X
5					X
6			X		
7		X			
8		X			
9		X			
10			X		
11		X			

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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Course Name	Code	Semester	Theory (hours/ week)	Application (hours/ week)	Laboratory (hours/ week)	National Credit	ECTS
Operations Research I	IE 232	Spring	3	0	0	3	5
Prerequisites	MATH 213 Linear Algebra						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery	Face to face						
Learning and teaching strategies	Lecturing, discussion and submission.						
Instructor (s)	Yavuz Selim ÖZDEMİR, PhD						
Course objective	Students should have the ability to model and solve real-life problems using linear programming techniques and analyze results obtained with such models. Students should be able to use software to solve a variety of models.						
Course Content	Historical development of operations research, modeling, graphical solution, Simplex and dual Simplex methods, duality and sensitivity analysis, transportation, assignment, and transshipment problem.						
References	1. Winston, W.L., Operations Research: Applications and Algorithms, 4th Edition, Brooks/Cole-Thomson Learning, 2004. 2. Frederick S. Hillier and Gerald J. Lieberman, Introduction to Operations Research and Revised CD-ROM 8, McGraw-Hill Science, 2005. 3. Taha, H. A., Operations Research: An Introduction, 8th Edition, Prentice Hall, 2006						
Learning outcomes	After taking this course students will be able to; 1. Model a problem using linear programming 2. Learn and use the basic solution techniques of linear programming such as Graphical Solution and the Simplex Algorithm 3. Model Transportation, Assignment and Transshipment problems and solve these problems by using appropriate optimization algorithms 4. Conduct sensitivity analysis of linear programming problems 5. Define primary-dual relationship and to make the economic interpretation of duality						

Subjects by weeks

Weeks	**Subjects**
1. Week	Introduction to OR
2. Week	A review of basic linear algebra
3. Week	Introduction to Linear Programming
4. Week	Introduction to Linear Programming the Graphical method
5. Week	The Graphical method
6. Week	The Simplex algorithm
7. Week	The Simplex algorithm
8. Week	Simplex
9. Week	Midterm Exam
10. Week	Sensitivity analysis
11. Week	Sensitivity analysis
12. Week	Duality
13. Week	Duality
14. Week	Duality Transportation problems
15. Week	Transportation problems. Assignment and transshipment problems
16. Week	Final Exam

Assessment Method

Semester Works	Number	Contribution
Attendance	14	0%
Laboratory	0	0%
Application	8	0%
Fieldwork	0	0%
Practice	0	0%
Homework Assessment	1	5%
Quiz	5	15%
Presentation	0	0%
Project	0	0%
Seminar	0	0%
Mid-term Exams	1	35%
Final Exam	1	45%
Total	30	100%
Contribution of semester Works to success points	29	55%
Contribution of final exam to success points	1	45%
Total	30	100%

Workload and ECTS Calculation

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory	0	0	0
Application	0	0	0
Specific practical training	0	0	0
Field activities	0	0	0
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	5	70
Presentation / Seminar Preparation	0	0	0
Project	0	0	0
Homework assignment	1	3	3
Quiz	5	3	15
Midterms (Study duration)	1	10	10
Final Exam (Study duration)	1	10	10
Total Workload	150		
Total Workload/30 hours	5		
ECTS	5		

Program Learning Outcomes - Course Learning Outcomes Matrix

Program Learning Outcomes	Course Learning Outcomes				
	LO1	LO2	LO3	LO4	LO5
PO-1	5				
PO-2		5	5		
PO-3					
PO-4				5	5
PO-5					
PO-6					
PO-7					
PO-8					
PO-9					
PO-10					
PO-11					

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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Course Name	Code	Semester	Theory (hours/week)	Application (hours/week)	Laboratory (hours/week)	National Credit	ECTS
Engineering Economy	IE 241	Fall	3	0	0	3	5
Prerequisites	None						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery	Face to face/Distance Learning/Hybrid						
Learning and teaching strategies	Lecturing, discussion and submission.						
Instructor (s)	Dr. H. Umut AKIN						
Course objective	This course aims to introduce the economic dimension of evaluating and selecting alternative investment projects. By the end of the course, the student will be able to investigate engineering economy problems, and formulate and solve such problems using appropriate conceptual and mathematical skills and modeling structures.						
Course Content	Economic analysis for engineering and managerial decision-making; cash flows, effect of time and interest rate on money and physical assets; methods of evaluating alternatives: present worth, future worth, annual worth, rate-of-return; cost concepts related to decision making; depreciation and taxes; effects of inflation.						
References	1. Chan S. Park, Contemporary Engineering Economics, Pearson, Fifth Edition (course book) 2. Blank, L., Tarquin, A, "Engineering Economy", 5th ed., McGraw-Hill., 2005.						
Learning outcomes	1. Apply the basic concepts of engineering economy as part of a decision-making process. 2. Evaluate investment opportunities and compare between alternatives using single and combined engineering economy factors. 3. Perform a replacement study considering inflation and indirect cost allocation. 4. Use depreciation and depletion models. 5. Utilize spreadsheet functions to perform economic calculations.						

Form IVb (English): Subjects by weeks

Weeks	Subjects
1. Week	Introduction, Basics of Financial Decisions
2. Week	Engineering Economic Decisions
3. Week	Interest Rate and Economic Equivalence
4. Week	Nominal and effective interest rates and continuous compounding
5. Week	Present worth and future worth analysis
6. Week	Capitalized cost evaluation
7. Week	Equivalent annual worth analysis
8. Week	Midterm Exam
9. Week	Application of equivalent annual worth analysis
10. Week	Rate of return analysis
11. Week	Rate of Return analysis
12. Week	Cost concepts relevant to Decision Making
13. Week	Depreciation and depletion models
14. Week	Effects of Inflation
15. Week	Final exam

Assessment Method

Semester Works	Number	Contribution
Attendance	14	%10
Laboratory	0	%0
Application	4	%20
Fieldwork	0	%0
Practice	0	%0
Homework Assessment	0	%0
Presentation	0	%0
Project	0	%0
Seminar	0	%0
Mid-term Exams	1	%30
Final Exam	1	%40
Total	20	%100
Contribution of semester Works to success points	19	%60
Contribution of final exam to success points	1	%40
Total	20	%100

Workload and ECTS Calculation

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory			
Application	4	6	24
Specific practical training			
Field activities			
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	5	60
Presentation / Seminar Preparation			
Project			
Homework assignment			
Midterms (Study duration)	1	5	5
Final Exam (Study duration)	1	10	10
Total Workload			141
Total Workload/30 hours			4.70
ECTS			5.00

Form VIIb (English): THE COURSE LEARNING OUTCOMES - PROGRAM OUTCOMES MATRIX

Program Outcomes	Course Outcomes				
	1	2	3	4	5
1	3	3	3	3	3
2	5	5	5	5	5
3	1	1	5	3	5
4	5	5	5	5	5
5	3	3	3	3	3
6	2	2	2	2	2
7	1	1	1	1	1
8	3	3	3	3	3
9	1	1	1	1	1
10	1	1	1	1	1
11	1	1	1	1	1

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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Course Name	Code	Semester	Theory (hours/week)	Application (hours/week)	Laboratory (hours/week)	National Credit	ECTS
Cost Analysis in Engineering	IE 242	Spring	3	0	0	3	5
Prerequisites	None						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery	Face to face/Distance Learning/Hybrid						
Learning and teaching strategies	Lecturing, discussion and submission.						
Instructor (s)	Dr. H. Umut AKIN						
Course objective	This course aims to provide the tools necessary to interpret and use accounting information related to the business environment, by concentration on the end uses of accounting information.						
Course Content	Organization, measurement and interpretation of economic information; basics of financial accounting; cost concepts and costing techniques; cost-volume-profit analysis; budgeting.						
References	1. Cost Analysis and Estimating for Engineering and Management, Phillip F. Ostwald, Timothy S. McLaren, Pearson Education, 9780131421271, 2003 2. Fundamentals of Cost Accounting 6e, William N. Lanen , Shannon W. Anderson , Michael W. Maher, McGraw Hill Education, 9781259969478, 2020 3. Financial & Managerial Accounting 19e, Jan Williams, Mark Bettner, Joseph Carcello, McGraw Hill Education, 9781260247930, 2021						
Learning outcomes	1. Students will recognize essential business and accounting terminology. 2. Students will become intelligent users of financial information in making critical business decisions. 3. Students will have the basic skills of financial statement analysis 4. Students will have a grasp of manufacturing costs and product costing.						

Subjects by weeks

Weeks	Subjects
1. Week	Introduction, Forms of organizations, Basic Accounting Equation
2. Week	Financial Statements: The account, Accounting System in Turkey
3. Week	Accounting for Merchandizing Operations and inventories
4. Week	Plant and intangible assets: Depreciation, methods used in Turkey
5. Week	Long-term liabilities , stockholders' equity, retained earnings
6. Week	Financial Statement analysis
7. Week	Midterm Exam
8. Week	Cost Concepts
9. Week	Cost-volume-profit analysis
10. Week	Job Order Costing
11. Week	Midterm II
12. Week	Process costing
13. Week	Activity Based Costing
14. Week	Budgeting and variance
15. Week	Final Exam

Assessment Method

Semester Works	Number	Contribution
Attendance	14	%10
Laboratory	0	%0
Application	4	%20
Fieldwork	0	%0
Practice	0	%0
Homework Assessment	0	%0
Presentation	0	%0
Project	0	%0
Seminar	0	%0
Mid-term Exams	1	%30
Final Exam	1	%40
Total	20	%100
Contribution of semester Works to success points	19	%60
Contribution of final exam to success points	1	%40
Total	20	%100

Form VIb (English): WORKLOAD AND ECTS CALCULATION

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory			
Application	4	3	12
Specific practical training			
Field activities			
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	5	70
Presentation / Seminar Preparation			
Project			
Homework assignment			
Midterms (Study duration)	1	5	5
Final Exam (Study duration)	1	8	8
Total Workload			137
Total Workload/30 hours			4.56
ECTS			5.00

Form VIIb (English): THE COURSE LEARNING OUTCOMES - PROGRAM OUTCOMES MATRIX

Program Outcomes	Course Outcomes				
	1	2	3	4	
1	3	3	3	3	
2	5	5	5	5	
3	1	1	5	3	
4	5	5	5	5	
5	3	3	3	3	
6	2	2	2	2	
7	1	1	1	1	
8	3	3	3	3	
9	1	1	1	1	
10	1	1	1	1	
11	1	1	1	1	

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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INDUSTRIAL ENGINEERING DEPARTMENT
COURSE INFORMATION

Course Name	Code	Semester	Theory (hours/ week)	Application (hours/ week)	Laboratory (hours/ week)	National Credit	ECTS
Facility Planning	IE 301	Fall	3	0	0	3	5
Prerequisites	None						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery	Face to face/Distance Learning/Hybrid						
Learning and teaching strategies	Lecturing, discussion and submission,presentation.						
Instructor (s)	Çiğdem Sıcakyüz, PhD						
Course objective	to provide the orientation into various theories, structural makeup, design, operations and functions related to managing recreational facilities and give knowledge about how to manage the foundation of a facility.						
Course Content							
References	1. Tompkins, James A., White, John A., Bozer, Yavuz A., and Tanchoco, J. M. A. (2010). Facilities Planning. NJ: John Wiley & Sons, Inc						
Learning outcomes	After taking this course students will be able to; 1. define and analyze product, process and schedule design interactions by studying the functions involved in the product development cycle. 2. solve facility design problems through analyzing layout models and design algorithms theoretically and using necessary modern engineering tools. solve facility location problems by applying analytical facilities location methods. 3. use facility layout models-algorithms and applying standards of professional and ethical responsibility to solve related problems. 4. design and analyze material handling systems through different material handling equipment and material handling principles used in the warehousing, manufacturing and supporting operations.						

Subjects by weeks

Weeks	Subjects
1. Week	Introduction to facilities planning
2. Week	Process design
3. Week	Flow systems
4. Week	Basic layout designs
5. Week	Algorithmic approaches
6. Week	Improvement algorithms
7. Week	Mid- term exam
8. Week	Materials handling
9. Week	Warehouse operations
10. Week	Storage models
11. Week	Multiple facility location problems
12. Week	Multiple facility location problems
13. Week	Evaluating facilities plans
14. Week	Term Project
15. Week	Term Project
16. Week	Final Exam

Assessment Method

Semester Works	Number	Contribution
Attendance	14	%0
Laboratory	0	%0
Application	8	%0
Fieldwork	0	%0
Practice	0	%0
Homework Assessment	0	%0
Presentation	5	%0
Project	2	%30
Seminar	0	%0
Mid-term Exams	1	%20
Final Exam	1	%50
Total	31	%100
Contribution of semester Works to success points	30	%50
Contribution of final exam to success points	1	%50
Total	31	%100

WORKLOAD AND ECTS CALCULATION

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory			
Application			
Specific practical training			
Field activities			
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	4	56
Presentation / Seminar Preparation			
Project	2	6	8
Homework assignment	14	2	28
Midterms (Study duration)	1	2	2
Final Exam (Study duration)	1	2	2
Total Workload			138
Total Workload/30 hours			4.6
ECTS			5.00

THE COURSE LEARNING OUTCOMES - PROGRAM OUTCOMES MATRIX

Program Outcomes	**Contribution Level***				
	1	2	3	4	5
1				X	
2			X		
3			X		
4				X	
5		X			
6				X	
7					X
8		X			
9			X		
10			X		
11			X		

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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COURSE INFORMATION

Course Name	Code	Semester	Theory (hours/ week)	Application (hours/ week)	Laboratory (hours/ week)	National Credit	ECTS
Project Management	IE324	Spring	3	0	0	3	3
Prerequisites	None						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery	Face to face/Distance Learning/Hybrid						
Learning and teaching strategies	Lecturing, discussion and submission, presentation.						
Instructor (s)	Çiğdem Sıcakyüz, PhD						
Course objective	to give a practical approach to managing projects, focusing on organizing, planning, and controlling the efforts of the project.						
Course Content	Life cycle of PM, Planning of Project, Time management, Resources Management, Communication and Team Management, Monitoring and Controlling, Stakeholder Management, Agile PM, Ethics.						
References	Larson, E.W. and Gray, C.F. (2018), Project management the managerial process Raworth, K. (2017), Doughnut Economics, Seven ways to think like a 21st Century Economist, Random House Russel, J.A. (2017), A brief guide to Business Classics, Robinson Marr, B. (2014), 25 Need to Know Key Performance Indicators, Pearson.						
Learning outcomes	After taking this course students will be able to; Figure out the importance of PM in most industries and businesses and to apply specific tools, models and processes. Comprehend the Importance of applying these methodologies and tools at the stages like Definition, Planning, Execution and Closing Phase in the Project's life cycle. The aware of the importance of Leadership specifically in heterogenous and virtual teams as well as governance and approaches to conflict resolutions. Know key levers for measurement and follow up, Management Dash Board and Key Performance Indicators. Identify and analyse factors for successful projects, as well as risk factors Know the structure of financial statements relating to profit and loss statement, cash flow statement and balance sheet.						

Form IVb (English): Subjects by weeks

Weeks	Subjects
1. Week	Introduction
2. Week	Project Life Cycles and the PM
3. Week	Initiating; Stakeholder Management
4. Week	Planning: Communication Management
5. Week	Planning: Scope Management, WBS, Time Management
6. Week	Scope and Time, cont. Demonstration of PM
7. Week	Mid- term exam
8. Week	Planning: Quality and Risk Management
9. Week	Planning: Cost Management.
10. Week	Planning: HR and Procurement Management
11. Week	Executing; Monitoring and Controlling
12. Week	Integration and Change Management
13. Week	Agile PM; Project Closing
14. Week	Ethics Revisited
15. Week	Team Project (The students may be asked to select a case study and presentation)
16. Week	Final Exam

Assessment Method

Semester Works	Number	Contribution
Attendance	14	%0
Laboratory	0	%0
Application	8	%0
Fieldwork	0	%0
Practice	0	%0
Homework Assessment	0	%0
Presentation	1	%0
Project	1	%20
Seminar	0	%0
Mid-term Exams	1	%20
Final Exam	1	%60
Total	26	%100
Contribution of semester Works to success points	27	%40
Contribution of final exam to success points	1	%60
Total	26	%100

Form VIb (English): WORKLOAD AND ECTS CALCULATION

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory			
Application			
Specific practical training			
Field activities			
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	1	14
Presentation / Seminar Preparation			
Project	1	10	10
Homework assignment	14	1	14
Midterms (Study duration)	1	4	4
Final Exam (Study duration)	1	6	6
Total Workload			90
Total Workload/30 hours			3,00
ECTS			3,00

Form VIIb (English): THE COURSE LEARNING OUTCOMES - PROGRAM OUTCOMES MATRIX

Program Outcomes	Contribution Level*				
	1	2	3	4	5
1					X
2					X
3					X
4				X	
5				X	
6					X
7					X
8					X
9					X
10					X
11				X	

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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COURSE INFORMATION

Course Name	Code	Semester	Theory (hours/ week)	Application (hours/ week)	Laboratory (hours/ week)	National Credit	ECTS
Quality Engineering	IE325	Fall	3	0	0	3	5
Prerequisites	None						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery	Face to face/Distance Learning/Hybrid						
Learning and teaching strategies	Lecturing, discussion and submission.						
Instructor (s)	Çiğdem Sıcakyüz, PhD						
Course objective	To teach basics of information of Quality-engineering and the tools used in Quality Management						
Course Content	Introduction, Total Quality Management, TeamWorking, Tools of Quality, 6Sigma, ISO Quality System Standards, Management of Change, Benchmarking, Case Studies						
References	1. Introduction to Statistical Quality Control, by D. C. Montgomery, John Wiley & Sons, Edition 6, 2009. 2. Quality Control and Industrial Statistics, by Acheson J. Duncan, IRWIN 1986, Fifth Edition. 3. Quality Engineering off-line methods and applications, by Chao-Ton Su, CRC Press, Taylor & Francis Group, 2013. 4. Statistical Methods for Quality Assurance, Stephen B. Vardeman and J. Marcus Jobe, Second Edition, Springer-Verlag,2016.						
Learning outcomes	After taking this course students will be able to; 1. know why organizations need change 2. understand how to improve the quality of the manufactured products or services to fiil the customers 3. able to categorize the quality management systems 4. obtain the philosophy of the Kaizen						

Subjects by weeks

Weeks	Subjects
1. Week	Introduction
2. Week	Total Quality Management
3. Week	Total Quality Management
4. Week	Team Working
5. Week	Tools of Quality
6. Week	Tools of Quality
7. Week	Mid- term exam
8. Week	Techniques of Quality
9. Week	Techniques of Quality
10. Week	Techniques of Quality
11. Week	Six Sigma 6 σ
12. Week	Six Sigma 6 σ
13. Week	Quality System Standards ISO 9001:6000
14. Week	Management of change and Benchmarking
15. Week	Case studies in Quality Management (The students may be asked to select a case study and presentation)
16. Week	Final Exam

Assessment Method

Semester Works	Number	Contribution
Attendance	14	%0
Laboratory	0	%0
Application	8	%0
Fieldwork	0	%0
Practice	0	%0
Homework Assessment	6	%0
Presentation	0	%0
Project	0	%0
Seminar	0	%0
Mid-term Exams	2	%35
Final Exam	1	%50
Total	30	%100
Contribution of semester Works to success points	29	%50
Contribution of final exam to success points	1	%50
Total	30	%100

WORKLOAD AND ECTS CALCULATION

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory			
Application			
Specific practical training			
Field activities			
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	6	84
Presentation / Seminar Preparation			
Project			
Homework assignment	6	2	12
Midterms (Study duration)	2	2	4
Final Exam (Study duration)	1	2	2
Total Workload			144
Total Workload/30 hours			4.8
ECTS			5.00

THE COURSE LEARNING OUTCOMES - PROGRAM OUTCOMES MATRIX

Program Outcomes	**Contribution Level***				
	1	2	3	4	5
1			X		
2				X	
3					X
4					X
5					X
6				X	
7				X	
8					X
9					X
10					X
11				X	

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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COURSE INFORMATION

Course Name	Code	Semester	Theory (hours/week)	Application (hours/week)	Laboratory (hours/week)	National Credit	ECTS
System Simulation	IE 327	Fall	3	0	0	3	5
Prerequisites	None						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery	Face to face/Distance Learning/Hybrid						
Learning and teaching strategies	Lecturing, discussion and submission.						
Instructor (s)	Dr. H. Umut AKIN						
Course objective	Introduction to Simulation; Review of Simulation Models; Statistical Models for Simulation; Queueing Models; Inventory Systems; Random Numbers; Input Data Analysis; Output Analysis; Verification & Validation of Simulation Models; Evaluation of Alternative System Designs						
Course Content	Components of discrete event simulation. Collection of statistics. Hand simulation, Generating Random Variables. Inverse-Transform Technique. Acceptance-Rejection Technique.						
References	1. Kelton, W.D., Sadowski, R.P., and Zupick, N.B. (2015). Simulation with Arena (6th ed.). McGraw-Hill. M0073401315. 2. Banks, J., Carson II, J.S. and Nelson, B.L. (2009). Discrete-Event System Simulation (5th ed.). Prentice Hall. 0134817893 3. Law, Averill M. Simulation Modeling and Analysis (5th ed.). McGraw-Hill. 0073401324						
Learning outcomes	1. Design a system, component, process to meet the requirements within realistic constraints. 2. Develop a simulation model of a system and simulate the system by hand. 3. Generate random variates using random numbers for a given probability distribution. 4. Develop, run, verify, and validate a simulation model using ARENA 5. Design and conduct experiments, as well as to analyze and interpret data.						

Form IVb (English): Subjects by weeks

Weeks	Subjects
1. Week	Introduction, Types of Simulation.
2. Week	Advantages and disadvantages of simulation. Steps in simulation.
3. Week	Components of discrete event simulation. Collection of statistics. Hand simulation.
4. Week	Probability and Statistics review.
5. Week	Simulation of a Single-Server Queueing System.
6. Week	Random Number Generators
7. Week	Generating Random Variables. Inverse-Transform Technique. Acceptance-Rejection Technique.
8. Week	Midterm Exam
9. Week	Input Distribution Fitting: Histogram, PP and QQ charts, Chi-square test, KS test.
10. Week	Verification and Validation of Simulation Models.
11. Week	Output Analysis: Confidence Interval, Terminating simulations.
12. Week	Output Analysis: Warm-up period, autocorrelation. Non-terminating simulations.
13. Week	Output Analysis: Comparison and Evaluation of Alternative System Designs
14. Week	Variance Reduction Techniques: Indirect measures, control variants.
15. Week	Final Exam

Assessment Method

Semester Works	Number	Contribution
Attendance	14	%10
Laboratory	0	%0
Application	4	%20
Fieldwork	0	%0
Practice	0	%0
Homework Assessment	0	%0
Presentation	0	%0
Project	0	%0
Seminar	0	%0
Mid-term Exams	1	%30
Final Exam	1	%40
Total	20	%100
Contribution of semester Works to success points	19	%60
Contribution of final exam to success points	1	%40
Total	20	%100

WORKLOAD AND ECTS CALCULATION

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory			
Application			
Specific practical training			
Field activities			
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	5	70
Presentation / Seminar Preparation			
Project	1	12	12
Homework assignment			
Midterms (Study duration)	1	5	5
Final Exam (Study duration)	1	8	8
Total Workload			137
Total Workload/30 hours			4.56
ECTS			5.00

THE COURSE LEARNING OUTCOMES - PROGRAM OUTCOMES MATRIX

Program Outcomes	Course Outcomes				
	1	2	3	4	5
1	3	3	4	3	3
2	3	4	3	3	4
3	3	3	3	3	3
4	3	4	3	3	3
5	4	3	3	4	3
6	2	2	3	2	2
7	3	2	3	2	2
8	2	2	3	2	2
9	2	3	2	2	2
10	3	2	2	3	2
11	2	1	3	2	2

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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Course Name	Code	Semester	Theory (hours/ week)	Application (hours/ week)	Laboratory (hours/ week)	National Credit	ECTS
Operations Research II	IE 333	Fall	3	0	0	3	5
Prerequisites	IE 232 Operations Research I						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery	Face to face						
Learning and teaching strategies	Lecturing, discussion and submission.						
Instructor (s)	Yavuz Selim ÖZDEMİR, PhD						
Course objective	Students should have the ability to model and solve real life problems using operations research techniques and be able to analyze results obtained with such models. Student should understand the different types of models, such as deterministic vs. stochastic. Students should be able to use software to solve such models.						
Course Content	Modeling with integer variables; network models: model formulation, minimal spanning tree, shortest path, maximal flow problems, critical path method and program evaluation review techniques; nonlinear programming.						
References	1. Winston, W.L., Operations Research: Applications and Algorithms, 4th Edition, Brooks/Cole-Thomson Learning, 2004. 2. Frederick S. Hillier and Gerald J. Lieberman, Introduction to Operations Research and Revised CD-ROM 8, McGraw-Hill Science, 2005. 3. Taha, H. A., Operations Research: An Introduction, 8th Edition, Prentice Hall, 2006						
Learning outcomes	After taking this course students will be able to; 1. A mathematical model for integer programming problems 2. Use solution methods for special classes of network optimization problems. 3. Use special methods of solution of integer programming problems. 4. A mathematical model for nonlinear programming problems. 5. Use appropriate software to solve mentioned mathematical models.						

Subjects by weeks

Weeks	**Subjects**
1. Week	A review of basic OR I and Introduction to Integer Programming
2. Week	Introduction to Integer Programming
3. Week	Formulating (Mixed) Integer Programming Problems
4. Week	Formulating (Mixed) Integer Programming Problems
5. Week	Solving Integer Programming Problems-Relationship to Linear Programming-Branch and Bound
6. Week	Solving Integer Programming Problems-Relationship to Linear Programming-Branch and Bound
7. Week	Solving Integer Programming Problems-Implicit Enumeration-Cutting Plane Algorithm
8. Week	Midterm Exam
9. Week	Algorithm History of the Network Models, Terminology and Notation
10. Week	Minimum Spanning Tree Problems-Prim's algorithm, Kruskal's algorithm
11. Week	Shortest Path Problems-Dijkstra's algorithm
12. Week	Maximum Flow Problems Ford-Fulkerson Algorithm, Max-flow Min-cut theorem
13. Week	Project Management, CPM and PERT, Crashing Project
14. Week	Minimum Cost Network Flow Problems, Network Simplex
15. Week	Dynamic Programming
16. Week	Final Exam

Assessment Method

Semester Works	Number	Contribution
Attendance	14	0%
Laboratory	0	0%
Application	8	0%
Fieldwork	0	0%
Practice	0	0%
Homework Assessment	1	5%
Quiz	5	15%
Presentation	0	0%
Project	0	0%
Seminar	0	0%
Mid-term Exams	1	35%
Final Exam	1	45%
Total	30	100%
Contribution of semester Works to success points	29	55%
Contribution of final exam to success points	1	45%
Total	30	100%

Workload and ECTS Calculation

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory	0	0	0
Application	0	0	0
Specific practical training	0	0	0
Field activities	0	0	0
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	5	70
Presentation / Seminar Preparation	0	0	0
Project	0	0	0
Homework assignment	1	3	3
Quiz	5	3	15
Midterms (Study duration)	1	10	10
Final Exam (Study duration)	1	10	10
Total Workload	150		
Total Workload/30 hours	5		
ECTS	5		

Program Learning Outcomes - Course Learning Outcomes Matrix

Program Learning Outcomes	Course Learning Outcomes				
	LO1	LO2	LO3	LO4	LO5
PO-1	5	5			
PO-2			5		
PO-3					
PO-4				5	5
PO-5					
PO-6					
PO-7					
PO-8					
PO-9					
PO-10					
PO-11					

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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COURSE INFORMATION

Course Name	Code	Semester	Theory (hours/ week)	Application (hours/ week)	Laboratory (hours/ week)	National Credit	ECTS
Decision Analysis	IE 346	Spring	3	0	0	3	5
Prerequisites	None						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery (face to face, distance learning)	Face to face						
Learning and teaching strategies	Lecturing, Discussion						
Instructor (s)	Yavuz Selim ÖZDEMİR, PhD						
Course objective	In this course, the students will be learning fundamental concepts of multi criteria decision making to be able to apply for their practical problems.						
Course Content	Decision theory, types and characteristics of decision making; components, elements, structure, process, models and matrix of decision making. Decision making problem and general characteristics. Decision situations. Multi-criteria decision-making Use of statistics and probability in design decision making. Sequential decision making.						
References	1. Winston W L, Operations Research: Applications & Algorithms, Brooks/Cole, 2008 2. Nutt P.C., Wilson, D.C., "Handbook of Decision Making", John Wiley & Sons, Ltd., UK, 3. Aladag, Z., "Karar Teorisi", Umuttepe Yayinlari, 2011.						
Learning outcomes	After taking this course students will be able to; 1. Classify decision making problems. 2. Solve business problems using decision making techniques. 3. Apply the multi criteria decision making techniques to complex systems. 4. Analyze business problems by providing solutions to utility and game theory perspective.						

Subjects by weeks

Weeks	**Subjects**
1. Week	Introduction to Decision Analysis and Decision Theory
2. Week	Decision Making Under Uncertainty
3. Week	Decision Making Under Risk, Utility Theory, Probability
4. Week	Decision Making Under Risk, Decision Trees
5. Week	Decision Making Under Risk, Game Theory
6. Week	Decision Making Under Certainty, Multi Criteria Decision Making (MCDM)
7. Week	MCDM Techniques, AHP
8. Week	Midterm Exam
9. Week	MCDM Techniques, TOPSIS
10. Week	MCDM Techniques, PROMETHEE
11. Week	MCDM Techniques, ELECTRE
12. Week	MCDM Techniques, VIKOR
13. Week	Multi Objective Decision Making (MODM)
14. Week	Multi Objective Decision Making (MODM)
15. Week	Goal Programming
16. Week	Final Exam

Assessment Method

Semester Works	Number	Contribution
Attendance	14	0%
Laboratory	0	0%
Application	8	0%
Fieldwork	0	0%
Practice	0	0%
Homework Assessment	1	5%
Quiz	5	15%
Presentation	0	0%
Project	0	0%
Seminar	0	0%
Mid-term Exams	1	35%
Final Exam	1	45%
Total	30	100%
Contribution of semester Works to success points	29	55%
Contribution of final exam to success points	1	45%
Total	30	100%

Workload and ECTS Calculation

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory	0	0	0
Application	0	0	0
Specific practical training	0	0	0
Field activities	0	0	0
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	3	42
Presentation / Seminar Preparation	0	0	0
Project	2	15	30
Homework assignment	1	5	5
Quiz	6	2	12
Midterms (Study duration)	1	9	9
Final Exam (Study duration)	1	10	10
Total Workload	150		
Total Workload/30 hours	5		
ECTS	5		

Program Learning Outcomes - Course Learning Outcomes Matrix

Program Learning Outcomes	Course Learning Outcomes			
	LO1	LO2	LO3	LO4
PO-1				
PO-2	5	5		
PO-3				
PO-4			5	5
PO-5				
PO-6				
PO-7				
PO-8				
PO-9				
PO-10				
PO-11				

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Course Name	Code	Semester	Theory (hours/week)	Application (hours/week)	Laboratory (hours/week)	National Credit	ECTS
Production Planning and Control I	IE 365	Fall	3	0	0	3	5
Prerequisites	None						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery	Face to face/Distance Learning/Hybrid						
Learning and teaching strategies	Lecturing, discussion and submission.						
Instructor (s)							
Course objective	To deliver background information about demand forecasting, aggregate production planning, inventory management, capacity planning and scheduling to minimize and to enhance competitiveness of an organization.						
Course Content	Manufacturing planning and control, demand management, forecasting, inventory management, inventory control subject to known demand, inventory control subject to uncertain demand, sales and operations planning, master production scheduling.						
References	1. Steven Nahmias, "Production and Operations Analysis", McGraw-Hill, Seventh Edition, 2015 2. Steven Nahmias, "Manufacturing Planning and Control for Supply Chain Management", McGraw-Hill, Seventh Edition, 2015						
Learning outcomes	1. Identify production planning levels and aggregate production plan strategies 2. Prepare aggregate production planning; calculate the total cost of production plan for given cost information and type of strategy 3. Formulate a mathematical model including the decision variables for an aggregate production planning problem and solve using a general-purpose software solver 4. Perform material and capacity requirement planning 5. Perform production scheduling operations						

Form IVb (English): Subjects by weeks

Weeks	Subjects
1. Week	Manufacturing planning and control
2. Week	Demand management
3. Week	Demand Forecasting
4. Week	Demand Forecasting
5. Week	Demand Forecasting
6. Week	Introduction to stocks and inventories; Stocks within an organizationInventory control subject to known demand.
7. Week	Inventory control subject to known demand
8. Week	Midterm Exam
9. Week	Inventory control subject to known demand
10. Week	Inventory control subject to known demand
11. Week	Inventory control subject to uncertain demand
12. Week	Inventory control subject to uncertain demand
13. Week	Sales and operations planning;Master Production Scheduling
14. Week	Material Requirement Planning (MRP)
15. Week	Final Exam

Assessment Method

Semester Works	Number	Contribution
Attendance	14	%10
Laboratory	0	%0
Application	4	%20
Fieldwork	0	%0
Practice	0	%0
Homework Assessment	0	%0
Presentation	0	%0
Project	0	%0
Seminar	0	%0
Mid-term Exams	1	%30
Final Exam	1	%40
Total	20	%100
Contribution of semester Works to success points	19	%60
Contribution of final exam to success points	1	%40
Total	20	%100

WORKLOAD AND ECTS CALCULATION

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory			
Application			
Specific practical training			
Field activities			
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	5	70
Presentation / Seminar Preparation			
Project	1	12	12
Homework assignment			
Midterms (Study duration)	1	5	5
Final Exam (Study duration)	1	8	8
Total Workload			137
Total Workload/30 hours			4.56
ECTS			5.00

THE COURSE LEARNING OUTCOMES - PROGRAM OUTCOMES MATRIX

Program Outcomes	Course Outcomes				
	1	2	3	4	5
1	3	4		3	3
2	4	5		3	4
3		4		4	5
4	5	5		5	4
5			3		
6			2		
7					
8					
9					
10					3
11			1		

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

ANKARA SCIENCE UNIVERSITY
FACULTY OF ENGINEERING AND ARCHITECTURE
INDUSTRIAL ENGINEERING DEPARTMENT
COURSE INFORMATION

Course Name	Code	Semester	Theory (hours/week)	Application (hours/week)	Laboratory (hours/week)	National Credit	ECTS
Production Planning and Control II	IE 366	Spring	3	0	0	3	5
Prerequisites	None						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery	Face to face/Distance Learning/Hybrid						
Learning and teaching strategies	Lecturing, discussion and submission.						
Instructor (s)							
Course objective	To deliver background information about aggregate production planning, inventory management and scheduling for enhancing competitiveness of an organization						
Course Content	Production planning strategies, Inventory management and Scheduling						
References	Steven Nahmias, "Production and Operations Analysis", McGraw-Hill, Seventh Edition, 2015 ; Production Planning, Control and Integration", D. Sipper and R. Bulfin, McGraw-Hill, 1997.						
Learning outcomes	1. Identify MRP and Just in Time Systems 2. Apprehend Independent demand 3. Compare economic order quantity and material requirement planning 4. Perform purchasing Management systems 5. Perform production scheduling operations.						

Form IVb (English): Subjects by weeks

Weeks	Subjects
1. Week	MRP and Just in Time Systems
2. Week	MRP and Just in Time Systems
3. Week	Independent Demand Systems
4. Week	Independent Demand Systems
5. Week	Independent Demand Systems
6. Week	EOQ-MRP Comparison
7. Week	EOQ-MRP Comparison
8. Week	Midterm Exam
9. Week	MRPII and ERP Systems
10. Week	MRPII and ERP Systems
11. Week	Maintenance Planning
12. Week	Maintenance Planning
13. Week	Purchasing Management
14. Week	Scheduling
15. Week	Final Exam

Assessment Method

Semester Works	Number	Contribution
Attendance	14	%10
Laboratory	0	%0
Application	4	%20
Fieldwork	0	%0
Practice	0	%0
Homework Assessment	0	%0
Presentation	0	%0
Project	0	%0
Seminar	0	%0
Mid-term Exams	1	%30
Final Exam	1	%40
Total	20	%100
Contribution of semester Works to success points	19	%60
Contribution of final exam to success points	1	%40
Total	20	%100

WORKLOAD AND ECTS CALCULATION

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory			
Application			
Specific practical training			
Field activities			
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	5	70
Presentation / Seminar Preparation			
Project	1	12	12
Homework assignment			
Midterms (Study duration)	1	5	5
Final Exam (Study duration)	1	8	8
Total Workload			137
Total Workload/30 hours			4.56
ECTS			5.00

THE COURSE LEARNING OUTCOMES - PROGRAM OUTCOMES MATRIX

Program Outcomes	Course Outcomes				
	1	2	3	4	5
1	3	4		3	3
2	4	5		3	4
3		4		4	5
4	5	5		5	4
5			3		
6			2		
7					
8					
9					
10					3
11			1		

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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FACULTY OF ENGINEERING AND ARCHITECTURE
INDUSTRIAL ENGINEERING DEPARTMENT
COURSE INFORMATION

Course Name	Code	Semester	Theory (hours/ week)	Application (hours/ week)	Laboratory (hours/ week)	National Credit	ECTS
Graduation Project I	IE 407	Fall	3	2	0	4	5
Prerequisites	Yes; Prerequisite Table.						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery (face to face, distance learning)	Face to face						
Learning and teaching strategies	Project design, discussion and submission.						
Instructor (s)	Yavuz Selim ÖZDEMİR, PhD						
Course objective	This course aims to motivate students to use their academic background for problem solving and to generate a project based solution for a predefined problem by teamwork.						
Course Content	Project topics can be related with field of industrial and systems engineering. It is also expected that the project be carried out by a team of 4-5 senior students under the supervision of related faculty member(s). The project's duration is expected to run over 2 semesters, and it will be separately graded at the end of each semester.						
References	1. Winston, W.L., Operations Research: Applications and Algorithms, 4th Edition, Brooks/Cole-Thomson Learning, 2004						
Learning outcomes	After taking this course students will be able to; 1. Conduct literature review for a specific project idea. 2. Propose a conceptual model for problem solving. 3. Transform the conceptual model into a feasible application for predefined problem. 4. Learn to conduct effective teamwork. 5. Gain experience on formal reporting and technical presentation.						

Subjects by weeks

Weeks	**Subjects**
1. Week	Identification of project topics and project teams.
2. Week	Developing project ideas with group discussions.
3. Week	Presentation of project idea outlines to the advisers.
4. Week	Weekly progress report submission
5. Week	Weekly progress report submission
6. Week	Weekly progress report submission
7. Week	Weekly progress report submission
8. Week	Literature review, problem definition and requirements analysis report submission.
9. Week	Weekly progress report submission
10. Week	Weekly progress report submission
11. Week	Weekly progress report submission
12. Week	Weekly progress report submission
13. Week	Weekly progress report submission
14. Week	Final project report submission.
15. Week	Oral group presentations.
16. Week	Oral group presentations.

Assessment Method

Semester Works	Number	Contribution
Attendance	14	0%
Laboratory	0	0%
Application	0	0%
Fieldwork	0	0%
Practice	0	0%
Homework Assessment	0	0%
Quiz	0	0%
Presentation	0	0%
Project	0	0%
Seminar	0	0%
Mid-term Exams	1	40%
Final Exam	1	60%
Total	16	100%
Contribution of semester Works to success points	15	40%
Contribution of final exam to success points	1	60%
Total	16	100%

Workload and ECTS Calculation

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory	14	2	28
Application	0	0	0
Specific practical training	0	0	0
Field activities	0	0	0
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	1	14
Presentation / Seminar Preparation	0	0	0
Project	1	56	56
Homework assignment	0	0	0
Quiz	0	0	0
Midterms (Study duration)	1	5	5
Final Exam (Study duration)	1	5	5
Total Workload	150		
Total Workload/30 hours	5		
ECTS	5		

Program Learning Outcomes - Course Learning Outcomes Matrix

Program Learning Outcomes	Course Learning Outcomes				
	LO1	LO2	LO3	LO4	LO5
PO-1		5			
PO-2					
PO-3					
PO-4			5		
PO-5	5				
PO-6				4	
PO-7					4
PO-8			3		
PO-9					
PO-10				3	
PO-11					

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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COURSE INFORMATION

Course Name	Code	Semester	Theory (hours/ week)	Application (hours/ week)	Laboratory (hours/ week)	National Credit	ECTS
Graduation Project II	IE 408	Spring	3	2	0	4	5
Prerequisites	IE 407 Graduation Project I						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery (face to face, distance learning)	Face to face						
Learning and teaching strategies	Project design, discussion and submission.						
Instructor (s)	Yavuz Selim ÖZDEMİR, PhD						
Course objective	This course aims to motivate students to use their academic background for problem solving and to generate a project-based solution for a predefined problem by teamwork.						
Course Content	Project topics can be related with field of industrial and systems engineering. It is also expected that the project be carried out by a team of 4-5 senior students under the supervision of related faculty member(s). The project's duration is expected to run over 2 semesters, and it will be separately graded at the end of each semester.						
References	1. Winston, W.L., Operations Research: Applications and Algorithms, 4th Edition, Brooks/Cole-Thomson Learning, 2004						
Learning outcomes	After taking this course students will be able to; 1. Conduct literature review for a specific project idea. 2. Propose a conceptual model for problem solving. 3. Transform the conceptual model into a feasible application for predefined problem. 4. Learn to conduct effective teamwork. 5. Gain experience on formal reporting and technical presentation.						

Subjects by weeks

Weeks	**Subjects**
1. Week	Identification of project topics and project teams.
2. Week	Developing project ideas with group discussions.
3. Week	Presentation of project idea outlines to the advisers.
4. Week	Weekly progress report submission
5. Week	Weekly progress report submission
6. Week	Weekly progress report submission
7. Week	Weekly progress report submission
8. Week	Literature review, problem definition and requirements analysis report submission.
9. Week	Weekly progress report submission
10. Week	Weekly progress report submission
11. Week	Weekly progress report submission
12. Week	Weekly progress report submission
13. Week	Weekly progress report submission
14. Week	Final project report submission.
15. Week	Oral group presentations.
16. Week	Oral group presentations.

Assessment Method

Semester Works	Number	Contribution
Attendance	14	0%
Laboratory	0	0%
Application	0	0%
Fieldwork	0	0%
Practice	0	0%
Homework Assessment	0	0%
Quiz	0	0%
Presentation	0	0%
Project	0	0%
Seminar	0	0%
Mid-term Exams	1	40%
Final Exam	1	60%
Total	16	100%
Contribution of semester Works to success points	15	40%
Contribution of final exam to success points	1	60%
Total	16	100%

Workload and ECTS Calculation

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	3	42
Laboratory	14	2	28
Application	0	0	0
Specific practical training	0	0	0
Field activities	0	0	0
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	1	14
Presentation / Seminar Preparation	0	0	0
Project	1	56	56
Homework assignment	0	0	0
Quiz	0	0	0
Midterms (Study duration)	1	5	5
Final Exam (Study duration)	1	5	5
Total Workload	150		
Total Workload/30 hours	5		
ECTS	5		

Program Learning Outcomes - Course Learning Outcomes Matrix

Program Learning Outcomes	Course Learning Outcomes				
	LO1	LO2	LO3	LO4	LO5
PO-1		5			
PO-2					
PO-3					
PO-4			5		
PO-5	5				
PO-6				4	
PO-7					4
PO-8			3		
PO-9					
PO-10				3	
PO-11					

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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Course Name	Code	Semester	Theory (hours/ week)	Application (hours/ week)	Laboratory (hours/ week)	National Credit	ECTS
Work Placement	IE 410	Spring	5	2	0	6	25
Prerequisites	IE407 Graduation Project I						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery (face to face, distance learning)	Face to face						
Learning and teaching strategies	Work Placement.						
Instructor (s)	Yavuz Selim ÖZDEMİR, PhD						
Course objective	Strengthening academic knowledge base of students with the help of field study.						
Course Content	Internship necessitates field experience at any work place (public private) for four weeks (twenty work days). The main objective is to motivate students for identification of an Industrial and System Engineering problem in an organization and to propose a model for problem solution.						
References	1. Winston, W.L., Operations Research: Applications and Algorithms, 4th Edition, Brooks/Cole-Thomson Learning, 2004						
Learning outcomes	After taking this course students will be able to; 1. Use academic knowledge in the field work. 2. Observe relations between organization units and personnel. 3. Access new knowledge and gain experience regarding real life problems in an organization. 4. Report her/his experience concerning field work and applications.						

Subjects by weeks

Weeks	**Subjects**
1. Week	Work Placement
2. Week	Work Placement
3. Week	Work Placement
4. Week	Work Placement
5. Week	Work Placement
6. Week	Work Placement
7. Week	Work Placement
8. Week	Work Placement
9. Week	Work Placement
10. Week	Work Placement
11. Week	Work Placement
12. Week	Work Placement
13. Week	Work Placement
14. Week	Work Placement
15. Week	Work Placement
16. Week	Work Placement

Assessment Method

Semester Works	Number	Contribution
Attendance	14	0%
Laboratory	0	0%
Application	0	0%
Fieldwork	0	0%
Practice	0	0%
Homework Assessment	0	0%
Quiz	0	0%
Presentation	0	0%
Project	0	0%
Seminar	0	0%
Mid-term Exams	1	40%
Final Exam	1	60%
Total	16	100%
Contribution of semester Works to success points	15	40%
Contribution of final exam to success points	1	60%
Total	16	100%

Workload and ECTS Calculation

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	16	5	80
Laboratory	0	0	0
Application	16	2	32
Specific practical training	1	576	576
Field activities	0	0	0
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	0	0	0
Presentation / Seminar Preparation	1	2	2
Project	1	60	60
Homework assignment	0	0	0
Quiz	0	0	0
Midterms (Study duration)	0	0	0
Final Exam (Study duration)	0	0	0
Total Workload		750	
Total Workload/30 hours		25	
ECTS		25	

Program Learning Outcomes - Course Learning Outcomes Matrix

Program Learning Outcomes	Course Learning Outcomes			
	LO1	LO2	LO3	LO4
PO-1				
PO-2				
PO-3				
PO-4				
PO-5				
PO-6				
PO-7				
PO-8				
PO-9				
PO-10				
PO-11				

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

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COURSE INFORMATION

Course Name	Code	Semester	Theory (hours/ week)	Application (hours/ week)	Laboratory (hours/ week)	National Credit	ECTS
Seminars in IE Practice	IE 499	Fall	2	0	0	2	3
Prerequisites	None						
Course Language	English						
Course Type	Compulsory						
Mode of Delivery	Face to face						
Learning and teaching strategies	Lecturing, discussion and submission.						
Instructor (s)	Yavuz Selim ÖZDEMİR, PhD						
Course objective	Throughout this course a series of seminars will be given by invited speakers on issues of current interest to the practice of industrial engineering to introduce IE students to the work atmosphere and opportunities available in academia and various manufacturing and service systems.						
Course Content	Throughout this course a series of seminars will be given by invited speakers on issues of current interest to the practice of industrial engineering to introduce IE students to the work atmosphere and opportunities available in academia and various manufacturing and service systems.						
References							
Learning outcomes	After taking this course students will be able to; 1. Aware of Industrial Engineering applications in business life. 2. Aware of environmental issues, sustainable development. 3. Aware of occupational safety and health, and their legal consequences. 4. Have an understanding of contemporary issues and the global and social effects of engineering practices as well as lifelong learning. 5. Have improved written and oral communication skills. 6. Aware of ethical issues.						

Subjects by weeks

Weeks	**Subjects**
1. Week	Meeting 1 (Introduction of the courses IE 407 and IE 408)
2. Week	Meeting 2 (Introduction of the course IE 499)
3. Week	Seminar 1 (Graduate Education and Academic Career in IE) given by the Department Chairperson
4. Week	Seminar 2 given by an invited speaker
5. Week	Seminar 3 given by an invited speaker
6. Week	Seminar 4 given by an invited speaker
7. Week	Seminar 5 given by an invited speaker
8. Week	Seminar 6 given by an invited speaker
9. Week	Seminar 7 given by an invited speaker
10. Week	Seminar 8 given by an invited speaker
11. Week	Seminar 9 given by an invited speaker
12. Week	Seminar 10 given by an invited speaker
13. Week	Seminar 11 given by an invited speaker
14. Week	Seminar 12 given by an invited speaker
15. Week	Seminar 13 given by an invited speaker
16. Week	Seminar 14 given by an invited speaker

Assessment Method

Semester Works	Number	Contribution
Attendance	14	0%
Laboratory	0	0%
Application	0	0%
Fieldwork	0	0%
Practice	0	0%
Homework Assessment	0	0%
Quiz	0	0%
Presentation	0	0%
Project	0	0%
Seminar	0	0%
Mid-term Exams	1	40%
Final Exam	1	60%
Total	16	100%
Contribution of semester Works to success points	15	40%
Contribution of final exam to success points	1	60%
Total	16	100%

Workload and ECTS Calculation

Activities	Number	Duration (hour)	Total Workload
Course Duration (x14)	14	2	28
Laboratory	14	1	14
Application	0	0	0
Specific practical training	0	0	0
Field activities	0	0	0
Study Hours Out of Class (Preliminary work, reinforcement, preparation for the exams)	14	1	14
Presentation / Seminar Preparation	0	0	0
Project	1	24	24
Homework assignment	0	0	0
Quiz	0	0	0
Midterms (Study duration)	1	5	5
Final Exam (Study duration)	1	5	5
Total Workload	90		
Total Workload/30 hours	3		
ECTS	3		

Program Learning Outcomes - Course Learning Outcomes Matrix

Program Learning Outcomes	Course Learning Outcomes				
	LO1	LO2	LO3	LO4	LO5
PO-1					
PO-2					
PO-3					
PO-4					
PO-5					
PO-6					
PO-7	5				
PO-8		5			
PO-9			5		
PO-10				5	
PO-11					5

1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest