EASTERN MEDITERRANEAN UNIVERSITY

FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

Information Technology

Master's Degree Programs

MODULES HANDBOOK

Tel: +90 392 630 1245

E-mail: cis.info@emu.edu.tr

Information Technology (With Thesis) Curriculum

Ref Code	Course Code	Full Course Title	Course Category	Credit				ECTS
				Lec	Lab	Tut	Credit	
NV5R0	ITEC500	Master Thesis	AC	0	0	0	0	60
NV5R1	ITEC513	Advanced Software Design and Development	AC	3	0	0	3	8
NV5R2	ITEC514	Research Methods and Ethics in Information Technology	AC	3	0	0	3	8
NV5R3	ITEC561	Machine Learning	AC	3	0	0	3	8
NV5R4	ITEC563	Neural Networks and Deep Learning	AC	3	0	0	3	8
NV5R5	REQ1	Area Elective I	AE	3	0	0	3	8
NV5R6	REQ2	Area Elective II	AE	3	0	0	3	8
NV5R7	REQ3	Area Elective III	AE	3	0	0	3	8
NV5RS	ITEC598	Seminar	AC	0	0	0	0	4

AC = Area Core AE = Area Elective
Lec = Lecture Hours Lab = Laboratory Hours Tut = Tutorial Hours

Information Technology (Without Thesis) Curriculum

Ref Code	Course Code	Full Course Title	Course Category	Credit				ECTS
				Lec	Lab	Tut	Credit	
NT5T1	ITEC513	Advanced Software Design and Development	AC	3	0	0	3	8
NT5T2	ITEC514	Research Methods and Ethics in Information Technology	AC	3	0	0	3	8
NT5T3	ITEC561	Machine Learning	AC	3	0	0	3	8
NT5T4	ITEC563	Neural Networks and Deep Learning	AC	3	0	0	3	8
NT5T5	REQ1	Area Elective I	AE	3	0	0	3	8
NT5T6	REQ2	Area Elective II	AE	3	0	0	3	8
NT5T7	REQ3	Area Elective III	AE	3	0	0	3	8
NT5T8	REQ4	Area Elective IV	AE	3	0	0	3	8
NT5T9	REQ5	Area Elective V	AE	3	0	0	3	8
NT5TA	REQ6	Area Elective VI	AE	3	0	0	3	8
NT5TP	ITEC599	Term Project	AC	0	0	0	0	20

AC = Area Core AE = Area Elective
Lec = Lecture Hours Lab = Laboratory Hours Tut = Tutorial Hours

EASTERN MEDITERRANEAN UNIVERSITY

FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Master Thesis
Course Code	ITEC500
Type	Full Time
Semester	Fall/Spring
Category	Area Core
EMU Credit	(0,0,0) 0
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	Weekly meetings with supervisor
ECTS Credit	60 What is ECTS? Why ECTS is needed? How does it work?
Workload	1800 Hours

List of Supervisors			
Name and Surname	**E-mail**	**Office No**	**Office Tel**
Prof. Dr. Ahmet Rizaner	ahmet.rizaner@emu.edu.tr	CT112	+90 392 6302480
Prof. Dr. Ali Hakan Ulusoy	alihakan.ulusoy@emu.edu.tr	CT118	+90 392 6302881
Prof. Dr. Nazife Dimililer	nazife.dimililer@emu.edu.tr	CT200	+90 392 6301246
Assoc. Prof. Dr. Emre Özen	emre.ozen@emu.edu.tr	CT201	+90 392 6301447
Asst. Prof. Dr. Akile Oday	akile.oday@emu.edu.tr	CT114	+90 392 6301183
Asst. Prof. Dr. Cem Yağlı	cem.yagli@emu.edu.tr	CT109	+90 392 6301137
Asst. Prof. Dr. Hasan Oylum	hasan.oylum@emu.edu.tr	CT118	+90 392 6301671
Asst. Prof. Dr. Hüsnü Bayramoğlu	husnu.bayramoglu@emu.edu.tr	CT103	+90 392 6302894
Asst. Prof. Dr. Mustafa T. Babagil	mustafa.babagil@emu.edu.tr	CT116	+90 392 6302885
Dr. Şebnem Çoban	sebnem.coban@emu.edu.tr	CT117	+90 392 6301677
Dr. Şensev İlkan	sensev.alicik@emu.edu.tr	CT110	+90 392 6301665
Dr. Yeşim Kapsıl Çırak	yesim.kapsil@emu.edu.tr	CT216	+90 392 6302310

Course Description
A master's thesis has to be a unique piece of work, which includes evaluation or thorough analysis of a method.

Teaching Methodology
• Students have weekly meetings with their supervisor. • Supervisors direct the student to prepare the necessary materials for successful completion of the thesis study. • All related forms are available on the graduate institute web site (http://grad.emu.edu.tr).

EASTERN MEDITERRANEAN UNIVERSITY

FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	IT Project Management
Course Code	ITEC511
Type	Full Time
Semester	Fall/Spring
Category	Compulsory
Workload	240 Hours
EMU Credit (Lec, Lab, Tut)	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture
ECTS Credit	8
Course Web Site	https://lms.emu.edu.tr

Instructors(s)	Assoc. Prof. Dr. Burak Erkut	**Office Tel**	2671
e-mail	Burak.Erkut@emu.edu.tr	**Office No.**	BE 165

Course Description

This course aims to provide a full understanding of the management roles, responsibilities and techniques needed in technology projects. The course also teaches how technology project management adopts as a computer system evolves from concept to implementation. All areas of the subject, including organization, work breakdown structure and scheduling, resources and project financing, project control and evaluation, management considerations, critical success factors and risk management will be discussed through the course.

General Learning Outcomes

On successful completion of this course students will have understanding of:

- Project management importance in all industries.
- Project manager's role and responsibilities.
- Tools and methods used in managing an IT project.
- Awareness of essential IT standards.
- Team management, monitoring and controlling of project tasks, communication, time and cost planning.

Teaching Methodology / Classroom Procedures

- Students will be assigned a case related to the lecture topics.
    - The purpose of the case is to enable students apply their theoretical knowledge to a real-life case.
    - Case presentations will be done during the lecture on 1 June 2023.
- Final exam is conducted as a written exam.
- Make-up exam will be given after the final exams.

Course Materials / Main References
Text Book: Methods of IT Project Management, Jeffrey L. Brewer, Kevin C. Dittman Innovation Project Management, Harold Kerzner. ***Resource Books:*** 1. IT Project Management, Sengage, Kathy Schwalde 2. Information Technology Project Management, 3rd Edition, John Wiley, Jack T. Marchewka 3. Information Systems Project Management, Pearson Prentice Hall, Mark A. Fuller Joseph S. Valacich Joey F. George ***Lecture Notes:*** All course materials are also available online in Adobe PDF (Portable Document Format).

Weekly Schedule / Summary of Topics	
Week 1 (02.03.)	**Background**
Week 2 (09.03.)	**Project Initiation and Selection**
Week 3 (16.03.)	**Project Scheduling and Cost Planning**
Week 4 (23.03.)	**Project Quality Assurance**
Week 5 (30.03.)	**Project Risk Management and Procurement Planning**
Week 6 (06.04.)	**Project Execution**
Week 7 (13.04.)	**Project Monitoring and Control**
Week 8 (20.04.)	**Innovation Tools and Processes**
Week 9 (27.04.)	**From Traditional to Innovation Project Management**
Week 10 (04.05.)	**Innovation and Strategic Project Planning, Tools and Processes for Innovation Project Management**
Week 11 (11.05.)	**Value-Based Innovation Project Management Metrics**
Week 12 (18.05.)	**Business Models and Disruptive Innovation**
Week 13 (25.05.)	**Innovation Roadblocks and Defining Innovation Project Success/Failure**
Week 14 (01.06.)	**Student Presentations of Cases**
Week 15 (08.06.)	**Final Exam**

Rules and Obligations
▪ Each student can have only one make-up exam. One who misses an exam should provide a medical report within 3 days after the missed exam. The make-up exam will be organized at the end of the term after the finals and will cover all the topics. No make-up exam will be given for any assignment. ▪ Once the grades are announced, the students have only one week to do objection about their grades. ▪ It is the students' responsibility to follow the announcement in the course web site. ▪ Students who do not pass the course and fail to attend the lectures regularly may be given NG grade.

Background Requirements
▪ Students are expected to be enrolled in Master's program. ▪ Students who lack an official proof (such as undergraduate transcript) of the required academic background must acquire a written permission from the course instructor for registering the course.

Method of Assessment			
Evaluation and Grading	**Attendance / Active Participation**	**Project / Presentation**	**Final Exam**
Percentage	20 %	40%	40%

Grading Criteria *											
A	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**C-**	**D+**	**D**	**D-**	**F**
90 - 100	85 – 89	80 - 84	75 - 79	70 - 74	65 - 69	60 - 64	56 - 59	53 - 55	50 - 52	40 - 49	0 - 39

* Letter grades will be decided after calculating the class average at the end of the semester and distribution of the grades will play a significant role in the evaluation.

EASTERN MEDITERRANEAN UNIVERSITY

FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Principles of Programming Languages
Course Code	ITEC512
Type	Full Time
Semester	Fall/Spring
Category	Area Elective
Workload	240 Hours
EMU Credit	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture
ECTS Credit	8
Course Web Site	http://lms.emu.edu.tr

Instructor(s)	Asst. Prof. Dr. Hasan Oylum	**Office Tel**	+90 392 6301671
E-mail	hasan.oylum@emu.edu.tr	**Office No**	CT 106

Course Description

This course aims to introduce students to the key concepts of the software development fundamentals of programming languages. The types of programming languages including samples and the areas which they are most effective today, are going to be taught in the course. The content of the course is designed to give enough experience to the students to understand the similarities and the difference of the programming languages which are actively used today, and to select the most appropriate programming language - development environment for a specific need - project.

General Learning Outcomes

On successful completion of this course students should be able to:

- Understand the syntax and semantics used in the development of programming languages.
- Differentiate the similarities and differences between different programming languages.
- Develop the solutions to real life problems using different programming languages.
- Interpret and modify program modules in different programming languages.
- Describe the significance of implementation.
- Adapt to the new languages.
- Express their ideas in terms of programming.
- Select the appropriate languages for a given problem.
- Use different programming languages.
- Understand the syntax and semantics of the programming languages.

Teaching Methodology / Classroom Procedures

- The course has three hours of lectures in a week.
- Class attendance is compulsory.
- Only one make-up exam will be given for the missing exams.
- Make-up exam will be given after the final exams.
- No make-up will be given for the project.
- Students are supposed to submit the assigned tasks on time.

- Home Page, http://sct.emu.edu.tr/oylum must frequently be visited for the course announcements, projects, etc.

Course Materials / Main References
Text Book: 1. Robert W. Sebesta, Concepts of Programming Languages, 10th Edition, ISBN: 978-0-273-76910-1, Pearson Education, 2013. ***Resource Books:*** 1. Allen B. Tucker, Robert E. Noonan, Programming Languages, Principles and Paradigms, Second Edition, McGraw-Hill, 2007. 2. Jan Skansholm, ADA 95 from the Beginning, Third Edition, Addison-Wesley, 1997. 3. C. Thomas Wu, an Introduction to OOP with Java, Second Edition, McGraw-Hill, 2001. ***Lecture Notes:*** Lecture notes are available on the course web site http://sct.emu.edu.tr/oylum (follow the button link for ITEC512)

Weekly Schedule / Summary of Topics	
Week 1	Introduction: Concepts of programming languages
Week 2	Evolution of the programming languages
Week 3-4	Lexical, syntax and semantics analysis
Week 5-7	Primary Constructs of Imperative Languages: Characteristics of Variables. (1 week) Data Types (1 week) Expressions, Assignment and Control Statements. (1 week)
Week 7-8	Midterm Examinations
Week 9-10	Primary Constructs of Imperative Languages: Subprograms and Their Implementation. (1 week) Data Abstraction Facilities. (1 week)
Week 11	Object Oriented Programming Languages
Week 12	Functional Programming Languages
Week 13	Logical Programming Languages
Week 14-15	Final Examinations

Requirements
• Each student can have only one make-up exam. One who misses an exam should provide a medical report within 3 days after the missed exam. The make-up exam will be organized at the end of the term after the finals and will cover all the topics. No make-up exam will be given for any quiz or assignment. • Once the grades are announced, the students have only one week to do objection about their grades. • It is the students' responsibility to follow the announcement in the course web site. • Students who do not pass the course and fail to attend the lectures regularly may be given NG grade.

	Method of Assessment		
Evaluation and Grading	**Project/Assignment**	**Midterm Exam**	**Final Exam**
Percentage	35 %	30 %	35 %

Grading Criteria :

Letter grades will be decided upon after calculating the averages at the end of the semester. Distribution of the averages will play a significant role in the evaluation of the Letter Grades.

EASTERN MEDITERRANEAN UNIVERSITY

FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Advanced Software Design and Development
Course Code	ITEC513
Type	Full Time
Semester	Fall/Spring
Category	Area Core
Workload	240 Hours
EMU Credit	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture per week
ECTS Credit	8
Course Web Site	lms.emu.edu.tr

Instructor(s)	Prof. Dr. Nazife Dimililer	**Office Tel**	+90 392 6301034
E-mail	nazife.dimililer@emu.edu.tr	**Office No**	CT215

Course Description

This course explores the practice as well as research in the field of software design and development. It builds on the knowledge and skills learnt in undergraduate Software Design and development course. The complete software design and development cycle is covered with latest methodologies and techniques including concepts such as change control, process management, and software development and testing.

General Learning Outcomes

On successful completion of this course students should be able to:

- Discuss and explain central concepts and principles within selected software engineering topics.
- Discuss current research within the selected software engineering topics.
- Identify relevant research literature for the selected software engineering topics
- Work in a software development team of a realistic size
- Build a software product using software engineering principles and procedures to.

Teaching Methodology / Classroom Procedures

- The course has three hours of lectures in a week mainly held in the form of a seminar.
- This course will be an in-depth examination of the SWE concepts. In addition to the lectures, we will read and discuss various related research papers.
- The students will read the material posted on course website prior to class. Class participation, discussion of the readings and presentation of a research topic shall play a major role in the final grade.
- Teams of 4-5 students will work on small software design and development projects. There will be two presentations for the project. The first presentation will be performed when the OO Design is completed. The final working product will be presented and demonstrated at the end of the term. All students in the team will participate in the presentation. Students will get individual marks for the presentation and questions answered during presentation.
- Each student will choose a research topic in the field of software engineering and write a survey-paper on the topic.
- There will be one written exam in this course. It will cover all material discussed during the semester unless otherwise announced by the course instructor.

- The written exam mark, class participation, team project and research paper will be used in determining the final grade.
- Course related materials will be posted on the course web site (http://staff.emu.edu.tr/nazifedimililer

Course Materials / Main References
Books Used:
Roger S Pressman, Bruce R. Maxim, *Software Engineering: A Practitioner's Approach, 8/e*, McGrawHill 2015 ISBN: 0078022126 Hans van Vliet, *Software Engineering: Principles and Practice*, 3rd Edition, Wiley 2008 ISBN : 9780470031469 Ian Sommerville, *Software Engineering , 10th Edition*, Pearson 2016 ISBN-13: 9780133943030
Lecture Notes:
Lecture notes are available on the course web site.

Weekly Schedule / Summary of Topics	
Week 1	Intro to Software Design and Development methodologies/Software Lifecycle,
Week 2	Requirements Engineering
Week 3	OO Design and Development
Week 4	Project Presentations
Week 5	Software Architecture
Week 6	UI Design, People and Team Management
Week 7-8	Verification/Validation, Testing Strategies
Week 9	Maintenance and Reengineering
Week 10	Component Based Software Engineering
Week 11	Service-Orientatation and Cloud Computing
Week 12	Search Based Software Engineering
Week 13	Aspect-oriented Software Development
Week 14	Configuration Management
Week 15	Project presentations
Week 16-18	Exam Week

Rules and Obligations
• Each student can have only one make-up exam. One who misses an exam should provide a medical report within 3 days after the missed exam. • The make-up exam will be organized at the end of the term after the finals and will cover all the topics. • No make-up exam will be given for any quiz or assignment. • Once the grades are announced, the students have only one week to do objection about their grades. • It is the students' responsibility to follow the announcement in the course web site. • Students who do not pass the course and fail to attend the lectures regularly may be given NG grade.

Background Requirements

- Students are expected to have taken a software engineering or software development or system analysis and design course at minimum undergraduate level for registering the course.
- Students who lack an official proof (such as undergraduate transcript) of the required academic background must acquire a written permission from the course instructor for registering the course.

	Method of Assessment				
Evaluation and Grading	**Term Project**	**Presentation**	**Survey-Paper**	**Class Participation**	**Final Exam**
Percentage	20 %	10%	20 %	10%	40 %

Grading Criteria *										
A	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**C-**	**D+**	**D**	**D-**	**F**
90 -100	85 - 89	80 - 84	75 - 79	70 - 74	65 - 69	60 - 64	56 - 59	53 - 55	50 - 52	40 - 49	0 – 39

* Letter grades will be decided upon after calculating the averages at the end of the semester and distribution of the averages will play a significant role in the evaluation of the letter grades.

EASTERN MEDITERRANEAN UNIVERSITY

FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Research Methods and Ethics in Information Technology
Course Code	ITEC514
Type	Full Time
Semester	Fall/Spring
Category	Area Core
Workload	240 Hours
EMU Credit	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture per week
ECTS Credit	8
Course Web Site	lms.emu.edu.tr

Instructor(s)	Asst. Prof. Dr. Emre Özen	**Office Tel**	+90 392 6301358
E-mail	emre.ozen@emu.edu.tr	**Office No**	CT102

Course Description

Participants will learn the steps of conducting a research within the context of Information Technology. Research process starting from the formalization of problem, review of literature, theorizing, methodologies like qualitative, quantitative and mixed method approaches will be discussed. Writing strategies, co-authorship and role of ethics in research will also be among the topics covered.

General Learning Outcomes

On successful completion of this course students should be able to:

- know the true nature of research in academic settings
- know how to choose and refine a research problem.
- conduct a literature review and understand how it can serve during the planning of a research project
- compare quantitative and qualitative research methods
- explain internal and external validity of a research
- know how to manage ethical issues related to protection from harm, voluntary and informed participation, right to privacy, and honesty with professional colleagues.
- describe general characteristics and purposes of observation studies, correlational research, development designs and survey research
- understand and recognize the examples of Experimental, Quasi-Experimental and Ex-post Facto designs
- identify situations in which mixed-methods designs are especially useful
- describe common sources of biases in a research
- plan and prepare a final research report

Teaching Methodology / Classroom Procedures

- The course has three hours of lectures in a week.
- Class attendance is compulsory.

- Only one make-up exam will be given for the missing exams.
- Make-up exam will be given after the final exams.
- No make-up will be given for the project.
- Students are supposed to submit the assigned tasks on time.
- Course related materials will be posted on the course web site.
- Presentation of topics by the instructor, followed by class discussion.
- Work on individual projects: research on a selected topic by the students: writing a paper and presenting in class via following strictly the rules discussed among the semester.
- Work on individual projects: Term project proposals will be prepared for ITEC599.
- Final exam will be conducted as a written exam that contains essay questions.

Course Materials / Main References
Text Book:
Paul D. Leedy, Jeanne Ellis Ormrod, "Practical Research Planning and Design" 11th edition, Pearson Education, 2015. ISBN: 978-1-292-07689-8
Kenneth S. Bordens, Bruce B. Abbott, "Research Design and Methods A Process Approach", 9th edition, McGraw-hill Education, 2014. ISBN: 978-0-07-8035456
Reference Books:
·Gate T. Wang, Keumjae Park, "Research and Report Writing: From topic selection to the complete paper", John Wiley & Sons,2016. ISBN:978-111-8963913
James D. Lester, "Writing Research Papers A Complete Guide", 15th edition, Pearson Education, 2016. ISBN:978-1-292-07689-8
Sharon M. Ravitch, Nicole M. Carl, "Qualitative Research Bridging The Conceptual, Theoretical and Methodological", Sage Publication, 2016. ISBN:978-1-4833-5174-2

Weekly Schedule / Summary of Topics	
Week 1	What research Is, philosophical assumptions underlying research methodologies, tools of research.
Week 2	Finding research project, identifying and describing the research problem, dividing the research problem into sub-problems.
Week 3	How to organize literature review, understanding when to quit.
Week 4	Research planning and methodologies, Quantitative and Qualitative approaches.
Week 5	Ethical Issues.
Week 6	How to write a project proposal.
Week 7-8	Midterm Examinations
Week 9	Quantitative research.
Week 10	Experimental, Quasi-Experimental, and Ex Post Facto Designs.
Week 11	Quantitative data analysis.
Week 12	Qualitative research.
Week 13	Qualitative data analysis.
Week 14	Mixed Method designs.
Week 15	Planning and preparing a final research report.
Week 16-18	Final Examinations

Rules & Obligations

- Each student can have only one make-up exam. One who misses an exam should provide a medical report within 3 days after the missed exam. The make-up exam will be organized at the end of the term after the finals and will cover all the topics. No make-up exam will be given for any assignment.
- Once the grades are announced, the students have only one week to do objection about their grades.
- It is the students' responsibility to follow the announcement in the course web site.
- Students who do not pass the course and fail to attend the lectures regularly may be given NG grade.

Background Requirement
• Students are expected to have a basic knowledge about what research & research tools is at minimum undergraduate level. • Students who lack an official proof (such as undergraduate transcript) of the required academic background must acquire a written permission from the course instructor for registering the course.

	Method of Assessment		
Evaluation and Grading	**Project**	**Midterm Exam**	**Final Exam**
Percentage	40 %	-	60 %

Grading Criteria *											
A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
90 -100	85 - 89	80 - 84	75 - 79	70 - 74	65 - 69	60 - 64	56 - 59	53 - 55	50 - 52	40 - 49	0 – 39

* Letter grades will be decided upon after calculating the averages at the end of the semester. Distribution of the averages will play a significant role in the evaluation of the Letter Grades.

EASTERN MEDITERRANEAN UNIVERSITY

FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Computer Networking Applications
Course Code	ITEC521
Type	Full Time
Semester	Spring/Fall
Category	Area Core
EMU Credit	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture per week
ECTS Credit	8 What is ECTS? Why ECTS is needed? How does it work?
Workload	240 Hours
Course Web Site	http://lms.emu.edu.tr

Instructor	Assist. Prof. Dr. Hüsnü Bayramoğlu	**Office Tel**	+90 392 6302894
E-mail	husnu.bayramoglu@emu.edu.tr	**Office No**	CT 103

Course Description

The main aim of this course is to familiarize students with advanced topics on the newest wired networking technologies with a special emphasis on networking applications. It provides an in-depth introduction to a wide range of topics in the field of computer networks including the Internet. Rather than explain how protocols work in the abstract, the most important protocols are defined to discuss how networks work in practice. This allows to include real-world experiences in the discussion. Topics covered include network protocols, Internet routing, peer to peer networks, network security, congestion control, error detection & correction, and internetworking. It focuses both on the existing technologies and new trends or changes in fundamentals, to derive a set of requirements that a useful network must meet.

General Learning Outcomes

On successful completion of this course, students will be able to:

- explain fundamentals of network protocols and architectures
- discuss the most important protocols used in Internet today
- discuss various types of applications layer protocols for most used applications
- explain reliable data transfer over packet switched networks
- explain how error and flow control is implemented in Internet today
- discuss the use of Internet Protocol as the delivery mechanism at the network layer
- list different techniques to detect transmission errors
- explain the layered architecture behind the Internet
- explain how data is encoded and transmitted on a physical link
- explain the security issues, network vulnerabilities and security measures

Teaching Methodology / Classroom Procedures

- The course has three hours of online lectures in a week.
- There is no lab works or tutorials.
- There is one online midterm exam and one online final exam.
- Chapters included in the exams will be posted on the course web site during the semester.
- There is an individual term project.
  - You should find a recent conference/journal paper, published in the last 3 years, related to Computer Networking Applications.

- The selected paper should be sent as an e-mail to husnu.bayramoglu@emu.edu.tr for confirmation.
- Once the topic is confirmed, you can start studying on the topic, do a research and prepare a report.
- The report should be between 3500-4000 words with the format provided on the course web site.
- Turnitin plagiarism test result must be obtained before the final submission.
- An account will be created for you to make the plagiarism test through Turnitin.
- The plagiarism test result must be less than 20%.
- No reports are accepted for grading with higher plagiarism test results.
- The deadline for submitting the report will be posted on the course web site.
- Late submissions will not be accepted.
- Project grade is out of 20%.
- The work done for the project should be presented according to the schedule posted on the course web site.
- The duration of the presentation is about 10-15 minutes for each student.
- Presentation grade is out of 10%.

- Class attendance is compulsory.
- Lecture notes are available on the course web site.

Course Materials / Main References
Text Book: James F. Kurose and Keith W. Ross., Computer Networking: A Top-Down Approach, 7th Ed. (2016), Pearson, ISBN: 978-0133594140.

Weekly Schedule / Summary of Topic	
Week 1	Overview on Computer Networks: The Network Edge, The Network Core, Delay, Loss, and Throughput in Packet-Switched Networks
Week 2	Application Layer: The Web and HTTP, FTP, SMTP, DNS, Peer-to-Peer Applications
Week 3-4	Transport Layer: Multiplexing and Demultiplexing, UDP, TCP, SCTP, Congestion Control
Week 5-6	Network Layer: Virtual Circuit and Datagram Networks, Forwarding and Routing, IPv4, IPv6, Inside a Router
Week 7	Network Layer: Routing Algorithms, OSPF, BGP, ICMP, Multicast Routing, DHCP
Week 8-9	**Midterm Examinations**
Week 10-11	The Link Layer: Error Detection and Correction Techniques, Multiple Access Links and Protocols, Link Layer Addressing and ARP
Week 12-13	Security in Computer Networks: Principles of Cryptography, VPN, Securing E-mails, Securing TCP Connections: SSL, Securing Wireless LANs: WEP
Week 14-15	Term Project Presentations
Week 16-17	**Final Examinations**

Rules and Obligations
• Each student can have only one make-up exam.   • One who misses an exam should provide a medical report within 3 days after the missed exam.   • The make-up exam will be organized at the end of the term after the finals and covers all the topics.   • Once the grades are announced, the students have only one week to do objection about their grades.   • Students who fail to attend the lectures regularly may be given NG grade.   • The student is responsible to check the course web site regularly and view the latest announcements.

Background Requirements
• Students are expected to have a networking background at minimum undergraduate level for registering the course.   • Students who lack an official proof (such as undergraduate transcript) of the required academic background must acquire a written permission from the course instructor for registering the course.

Method of Assessment

Evaluation and Grading	**Term Project**	**Midterm Exam**	**Final Exam**
Percentage	30 %	30 %	40 %

Grading Criteria *											
A	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**C-**	**D+**	**D**	**D-**	**F**
90 - 100	85 - 89	80 - 84	75 - 79	70 - 74	65 - 69	60 - 64	56 - 59	53 - 55	50 - 52	40 - 49	0 - 39

* Letter grades will be decided after calculating the class average at the end of the semester and distribution of the grades will play a significant role in the evaluation.

EASTERN MEDITERRANEAN UNIVERSITY

FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Computer Security and Cryptography
Course Code	ITEC540
Type	Full Time
Semester	Fall/Spring
Category	Area Elective
Workload	240 Hours
EMU Credit	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture per week
ECTS Credit	8
Course Web Site	http://lms.emu.edu.tr/

Instructor(s)	Asst.Prof.Dr. Mustafa T. Babagil	**Office Tel**	+90 392 6302885
E-mail	mustafa.babagil@emu.edu.tr	**Office No**	CT116

Course Description

The course introduces fundamental principles and concepts in computer security and teaches cryptography as a leveraging tool for building secure computer systems. Topics on cryptography include simple ciphers, both symmetric and asymmetric encryption, hash functions, message authentication codes and digital signatures. Other main computer security issues such as authentication, access control, operating system security and secure programming are also given. Security standards are briefly presented.

General Learning Outcomes

On successful completion of this course students should be able to:

- Discuss and explain meaning of secure computer systems.
- Discuss and learn how cryptography is effective on secure computer systems.
- Explain both symmetric and asymmetric encryption, hash functions.
- Understand message authentication codes and digital signatures.
- Understand main computer security issues such as authentication, access control, operating system security and secure programming briefly.
- Explain briefly the Security standards.

Teaching Methodology / Classroom Procedures

- The course has three hours of lectures in a week mainly held in the form of a seminar.
- The students will read the material posted on course website prior to class. Class participation, discussion of the readings and presentation of a research topic shall play a major role in the final grade.
- Students will have a presentation subject related on cryptography or computer security.
- Each student will choose a research topic in the field of cryptography and write a survey-paper on the topic.
- There will be one written exam in this course. The written exam mark, class participation, team project and research paper will be used in determining the final grade.
- Course related materials will be posted on the course web site (http://lms.emu.edu.tr/)

Course Materials / Main References

Books Used:

Cryptography and Network Security, William Stallings, 6th Edition, Pearson Education, 2013.

Lecture Notes:

Lecture notes are available on the course web site.

Weekly Schedule / Summary of Topics	
Week 1	Fundamental concepts in computer security
Week 2	Computer and Network Security-Part 1
Week 3	Introduction to terminology.
Week 4	Cryptography
Week 5	Classical Encryption techniques - Substitution Techniques
Week 6	Caesar cipher (or) shift cipher - Playfair cipher Vigenere cipher - One Time Pad Cipher definition
Week 7	Transposition Techniques -Row Transposition Technique
Week 8-9	Midterm Exams weeks
Week 10	Feistel cipher structure - Block cipher principles
Week 11	Computer security - authentication, access control briefly
Week 12	Computer Security - operating system security and secure programming briefly
Week 13	Hash Functions definition
Week 14	Presentations and submissions of Term Project
Week 15	Presentations and submissions of Term Project
Week 16-18	Exam Week

Requirements
• Each student can have only one make-up exam. One who misses an exam should provide a medical report within 3 days after the missed exam. • The make-up exam will be organized at the end of the term after the finals and will cover all the topics. • No make-up exam will be given for any quiz or assignment. • Once the grades are announced, the students have only one week to do objection about their grades. • It is the students' responsibility to follow the announcement in the course web site. • Students who do not pass the course and fail to attend the lectures regularly may be given NG grade.

	Method of Assessment			
Evaluation and Grading	**Term Project	Home Works	Class Participation	Final Exam
Percentage	10+10+10 = 30 %	20 %	10 %	40 %

Grading Criteria *											
A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
90 -100	85 - 89	80 - 84	75 - 79	70 - 74	65 - 69	60 - 64	56 - 59	53 - 55	50 - 52	40 - 49	0 – 39

* Letter grades will be decided upon after calculating the averages at the end of the semester and distribution of the averages will play a significant role in the evaluation of the letter grades.

** Term project will have to be submitted as a REPORT word document + PRESENTATION file (power point) + PRESENTATION in class.

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FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Information Technology and Instruction
Course Code	ITEC542
Type	Full Time
Semester	Fall/Spring
Category	Area Elective
Workload	240 Hours
EMU Credit	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture
ECTS Credit	8
Course Web Site	http://www.emu.edu.tr/bsonyel/course3.html

Instructor(s)	Asst.Prof.Dr. Bengi Sonyel	**Office Tel**	+90 392 6302390
E-mail	bengi.sonyel@emu.edu.tr	**Office No**	Old Student affairs building 1st floor

Course Description

Basic concepts related to instruction, principles of learning and instruction, the importance and utilities of planned steps in instruction, planning instruction (yearly, weekly lesson plans), learning and instruction strategies, instructional methods and techniques, making a linkage between these methods, techniques and the practice, instructional materials, the roles and responsibilities of the teachers in enhancing the quality of instruction, competencies of teacher in relation with instructional design and information technology; introducing instructional technology, application of instructional technology; evaluation of instructional technology; designing and implementation of instructional materials.

General Learning Outcomes

On successful completion of this course students should be able to:

- identify with the basic concepts related to instruction.
- identify with the principles of learning and instruction, instructional strategies, methods and techniques.
- identify with the cognitive and behavioral approaches to teaching
- name some important cognitive and behavioral approaches to teaching in instructional technology
- discuss the purposes, characteristics, advantages and limitations of instructional methods, strategies and techniques.
- compare and contrast the purposes, characteristics, advantages and limitations of instructional methods, strategies and techniques in instructional technology
- evaluate the purposes, characteristics, advantages and limitations of instructional methods, strategies and techniques.
- develop a personal and individualized understanding towards instructional approaches, methods techniques and strategies in instructional technology and teaching.

Teaching Methodology / Classroom Procedures

- The course has three hours of lectures in a week.

- Students learn by doing in group activities.
- Students construct their own knowledge through the guidance of the instructor.
- Theoretical information is given to the students through group works or presentations.
- Class attendance is compulsory.
- Only one make-up exam will be given for the missing exams at the end of the semester.
- No make-ups will be given for the whole class activities.

Course Materials / Main References
Text Book:
Instructional Technology and Media for Learning (5th edt) (2005) Smaldino, S.E. ; Russell J.D. ; Heinich, R. and Molenda, M. Prentice Hall, Inc. A Simon & Schuster Company, Englewood Cliffs, New Jersey.

Weekly Schedule / Summary of Topics	
Week 1	Meeting the students and overview of the course and Introduction to the basic concepts related to instruction
Week 2	Technology, Media, and Learning
Week 3	Technology, Media, and Learning
Week 4	Instructional Systems
Week 5	Instructional Systems
Week 6	The Assure Model: Creating the Learning Experience
Week 7	The Assure Model: Creating the Learning Experience
Week 8	*Mid-term Examination* *Discussion of exam questions*
Week 9	Visual Principles
Week 10	Visual Principles
Week 11	Online Learning
Week 12	Online Learning
Week 13	Instructional Materials and Displays
Week 14	Instructional Materials and Displays
Week 15	*Final Examination*

Requirements
Students are required to: • read about the subject that will be studied in class before coming to class, • participate actively in the discussions and tasks, • attend at least 80% of class hours in the semester.

Method of Assessment				
Evaluation and Grading	**Class Reflection and Tasks**	**Midterm I**	**Midterm II**	**Final Exam**
Percentage	15%	25 %	20 %	40 %

Grading Criteria : 90-100 = A 75-79 = B 60-64 = C 50-52= D

85-89 = A- 70-74 = B- 56-59 = C- 40-49=D- I = incomplete

80-84 = B+ 65-69 = C+ 53-55= D+ 00-39= F

Not attending to the classes or applying the course requirements= NG

_____

For theoretical courses the required participation is 70% and for practical courses 80%.Students below these ranges will be given NG. Students who take NG are not allowed to sit for final and re-sit exams. Health reports are not valid for attendance.

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FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Data Gathering & Recovery in Computer Systems
Course Code	ITEC543
Type	Full Time
Semester	Fall/Spring
Category	Area Elective
Workload	240 Hours
EMU Credit	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture per week
ECTS Credit	8
Course Web Site	lms.emu.edu.tr

Instructor(s)	Asst.Prof.Dr. Hüsnü Bayramoğlu	**Office Tel**	+90 392 6302894
E-mail	husnu.bayramoglu@emu.edu.tr	**Office No**	CT100

Course Description

Data gathering and recovery in computer systems often involves a process of search and discovery of data. The process of search and discovery involves the analysis of data storage and communication systems. The analysis of data storage includes the retrieve of the deleted data in computer systems and constructs evidences of past actions.

Good backup and recovery strategies are key to the health of any organization. Designing realistic recovery solutions is very important. Medium- to very-large-scale systems administrators have to protect large amounts of critical data as well as design backup solutions that are scalable and optimized to meet changing conditions. The main of this course focuses on the implementation of 21st century architectures that provides the framework for meeting the requirements of data protection for the organization.

Continuous data protection and remote replication strategies are also addressed as they are integrated within backup strategies.

General Learning Outcomes

On successful completion of this course students should be able to:

- Describe the elements of a backup environment and applications of those elements
- Discuss new technologies within the backup technology area and their impact on design
- Identify combinations of both hardware and software configurations that are scalable from small to large environments
- Discuss designs that address physical and virtual backup environments
- Describe new media technologies
- Report requirements that will assist in maintaining application backup strategies
- Identify sample backup environments
- Have the necessary knowledge of related research literature

Teaching Methodology / Classroom Procedures

- The course has three hours of lectures in a week mainly held in the form of a seminar.
- There is no lab works or tutorials.
- There will be one written midterm exam and one written final exam.
- The exams are conducted as a written exam that may contain multiple choice, fill in the blanks, short answer and writing essay questions.
- There is an individual term project.
    - You should find a recent conference/journal paper (published in the last 5 years) related to Data Backup and Recovery in Computer Systems.
    - The selected paper should be sent as an e-mail to husnu.bayramoglu@emu.edu.tr and wait for the confirmation.
    - Once the topic is confirmed, you can start studying the topic and prepare a written report.
    - The printed report should be submitted before the announced deadline.
    - Late submissions will not be accepted.
    - Project grade is out of 20%.
    - The report should be between 3500-4000 words with the format provided in the report template on the web site.
    - Turnitin plagiarism test must be obtained before submission.
    - The plagiarism test result should be less than 20%.
    - No reports will be accepted for consideration with higher plagiarism test result.
    - An account will be created for you to make the plagiarism test through Turnitin.
    - The work done for the project should be presented.
    - The duration will be about 15 minutes for each student.
    - Presentation grade is out of 10%.
- Class attendance is compulsory.
- Course related materials will be posted on the course web site.

Course Materials / Main References
Text Book: Steven Nelson, *Pro Data Backup and Recovery-Expert's Voice in Data Management*, Apress, 2011, ISBN-13: 978-1430226628   ***Lecture Notes:***   Lecture notes are available on the course web site in PDF format.

Weekly Schedule / Summary of Topics	
Week 1	Distinction Between Backup and Archive
Week 2	Backup Softwares: Commvault Simpana and Symantec BackupBackup
Week 3	Physical Backup Media: Tape Characteristics, RAID Implementations, Network Attached Storage
Week 4	Virtual Backup Media: Virtual Tape Libraries, Storage Virtualization
Week 5	New Media Technologies: Deduplication Techniques, Continuous Remote Replication, Cloud Storage
Week 6	Storage Policies for CommVault Simpana
Week 7-8	Midterm Exams
Week 9	Storage Policies for Symantec NetBackup
Week 10-11	Application Backup Strategies: File systems, Databases, Mail Servers
Week 12	Putting It All Together: Sample Backup Environments
Week 13	Remote Office Deployments
Week 14	Presentations for Term Projects
Week 15	Presentations for Term Projects
Week 16-18	Final Examinations

Rules and Obligations
• Each student can have only one make-up exam. One who misses an exam should provide a medical report within 3 days after the missed exam. • The make-up exam will be organized at the end of the term after the finals and will cover all the topics. • No make-up exam will be given for any quiz or assignment. • Once the grades are announced, the students have only one week to do objection about their grades. • It is the students' responsibility to follow the announcement in the course web site. • Students who do not pass the course and fail to attend the lectures regularly may be given NG grade.

Background Requirements
• Students are expected to have a basic computer hardware/software knowledge at minimum undergraduate level for registering the course. • Students who lack an official proof (such as undergraduate transcript) of the required academic background must acquire a written permission from the course instructor for registering the course.

	Method of Assessment		
Evaluation and Grading	**Term Project**	**Midterm Exam**	**Final Exam**
Percentage	30 %	30 %	40 %

Grading Criteria *											
A	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**C-**	**D+**	**D**	**D-**	**F**
90 -100	85 - 89	80 - 84	75 - 79	70 - 74	65 - 69	60 - 64	56 - 59	53 - 55	50 - 52	40 - 49	0 – 39

* Letter grades will be decided upon after calculating the averages at the end of the semester and distribution of the averages will play a significant role in the evaluation of the letter grades.

EASTERN MEDITERRANEAN UNIVERSITY

FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Text Mining
Course Code	ITEC547
Type	Full Time
Semester	Fall/Spring
Category	Area Elective
Workload	240 Hours
EMU Credit	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture
ECTS Credit	8
Course Web Site	lms.emu.edu.tr

Instructor(s)	Prof. Dr. Nazife Dimililer	**Office Tel**	+90 392 6301034
E-mail	nazife.dimililer@emu.edu.tr	**Office No**	CT215

Course Description

This course presents a discussion of the development of NLP applications in the text mining/information extraction area from theoretical and practical perspectives. Machine learning architectures are applied to NLP text to mine required information. Topics discussed include overview of the nature of unstructured and semi-structured text, text classification, feature extraction, feature selection, evaluation of classification, tokenization, stemming, lemmatization, parsing, derivation of linguistic features, text categorization, text clustering, concept /entity extraction, sentiment analysis, document summarization, question answering. Machine language algorithms, probabilistic models, rule based models.

General Learning Outcomes

On successful completion of this course students should be able to:

- Describe need and use for text mining
- Discuss the current text mining approaches and applications
- Design and implement text mining applications

Teaching Methodology / Classroom Procedures

- The course has three hours of lectures in a week.
- Topics will be covered during lecture hours.
- Research papers will be assigned as reading assignments and students are expected to read the papers and participate in discussions on these papers.
- One individual project will be assigned to each student to implement a small scale text mining solution based on a published research paper. The student will write a short report on the results and compare with published work. The results will be presented in class.
- Class attendance is compulsory.
- Both midterm and Final exam will be classical type.
- Assignments will mainly focus on writing text processing/cleansing programs.
- Only one make-up exam will be given for the missing exams.

- Make-up exam will be given after the final exams. No make-up will be given for the project.
- Students are supposed to submit the assigned tasks on time.
- Course related materials will be posted on the course web site (http://staff.emu.edu.tr/nazife.dimililer/itec582).

Course Materials / Main References
This course does not use a traditional textbook. Instead, you will be reading from different websites, articles and e-books. The following books will be utilized throughout the semester 1. Data Mining, Iam H. Witten, Eibe Frank, Mark A. Hall, Morgan Kaufman 2. Modern Information Retrieval, Ricardo Baeza-Yates, Berthier Riberio-Neto, Addison-Wesley 3. Introduction to Information Retrieval by Christopher D. Manning, Prabhakar Raghavan and Hinrich Schutze . (available online). 4. Text Mining : Applications and Theory, M. W. Berry, J. Kogan, Wiley Press (e-book available) 5. Survey of Text Mining, Clustering, Classification, and Retrieval, Michael W. Berry (editor), Springer 6. Speech and Language Processing, DANIEL Jurafsky, James H. Martin, Prentice Hall ***Lecture Notes:*** Lecture notes are available on the course web site.

Weekly Schedule / Summary of Topics	
Week 1	Introduction, Overview of KDD, Data Mining, Text Mining, Natural Language Processing, Machine Learning.
Week 2-3	Exploring Text: tokenization, stemming, base words, patterns in Words and Letters, word-meaning, indexing document text
Week 4-5	Markov Models and POS tagging: HMM, POS taggers
Week 6-7	Machine learning
Week 8	Information Extraction
Week 9	Search Engines, Searching the Web
Week 10-11	Clustering Documents; Clustering Partitioning, Hierarchical, Agglomerative, Divisive, Grid based, Model based
Week 12	Text categorization/spam filtering
Week 13-14	Summarization , Question and Answer
Week 15-17	Selected topics/Paper discussion (Paper Discussion will be scheduled after Machine learning topics according to the main subject of the selected papers)
Week 18	Project Presentations

Requirements
• Each student can have only one make-up exam. One who misses an exam should provide a medical report within 3 days after the missed exam. The make-up exam will be organized at the end of the term after the finals and will cover all the topics. No make-up exam will be given for any quiz or assignment. • Once the grades are announced, the students have only one week to do objection about their grades. • It is the students' responsibility to follow the announcement in the course web site. • Students who do not pass the course and fail to attend the lectures regularly may be given NG grade.

Background Requirements
▪ Students are expected to have minimum undergraduate level programming background preferably in python

	Method of Assessment

Evaluation and Grading	**Assignments**	**Project/Presentation**	**Midterm Exam**	**Final Exam**
Percentage	10%	25 %	30 %	35 %

Grading Criteria :

Letter grades will be decided upon after calculating the averages at the end of the semester. Distribution of the averages will play a significant role in the evaluation of the Letter Grades.

EASTERN MEDITERRANEAN UNIVERSITY

FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Data Analysis with Software
Course Code	ITEC549
Type	Full Time
Semester	Fall/Spring
Category	AE (Area Elective)
Workload	240 Hours
EMU Credit	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture per week
ECTS Credit	8
Course Web Site	http://staff.emu.edu.tr/mustafababagil

Instructor(s)	Asst. Prof. Dr. Mustafa T. Babagil	**Office Tel**	+90 392 6302885
E-mail	mustafa.babagil@emu.edu.tr	**Office No**	CT 116

Course Description

It is very important for the researchers to analyze the collected data. Furthermore, using a special software to generate output with the collected data and commenting on the output is very critical. This course is mainly designed to teach the fundamentals of using software for the collected data such as variable definitions, data input, data analysis, etc. In addition to this, fundamentals related to tests that may help the students to make their own comments on the output tables produced by the used software will be discussed. In order to make appropriate comments on outputs, one should learn statistics thoroughly.

General Learning Outcomes

On successful completion of this course students should be able to:

- Understand how data can be collected.
- Understand how to write collected data to the software in use.
- Understand fundamental knowledge about statistical tests available on the software.
- Learn descriptive statistics tools and their comments
- Use fundamental tools of the software to analyze data.
- Make comments on the output tables produced by software.

Teaching Methodology / Classroom Procedures

- The course has three hours of lectures in a week mainly held in the form of a seminar in a class.
- Lecture notes will be available on the course web site.
- There will be 2 quizzes during the semester and one presentation by each student which will be graded according to their performances on the research report and on the presentation related the report and there will be a final exam.
    - Quiz 1. (before first midterm period)
    - Quiz 2. (before final exam period)
    - The duration of the quizzes are 45 mins - 60 mins.

- There is a final exam based on the lecture materials and the presentations done by students. It is important to be in class to keep notes during others presentations.
- There will be a presentation related to data analysis. Either a raw collected data or a predesigned and downloaded data could be used by each student (each student will have different data sets).
- Class attendance is compulsory.
- The student is responsible to check the course web site regularly and view the latest announcements. Also mails are important to follow sent by instructor during the whole semester.

Course Materials / Main References
Text Book: No Textbook. Lecture notes are prepared and will be refreshed every semester as the materials dynamically may need to update according to the software used.

Weekly Schedule / Summary of Topics	
Week 1	Understanding why data analysis is important in researches.
Week 2	Data input to the special software (r, SPSS or Excel).
Week 3	Defining Variables, and understand variable types that could be used
Week 4	Statistical tests available in the S/W that is going to use – meaning of ANOVA test.
Week 5	Understanding statistical tests. Parametric versus non-parametric tests.
Week 6	Using Cross-tab and making comment by using percentages/ frequencies
Week 7	Descriptive Statistics and comments
Week 8-9	**Midterm Examinations Period**
Week 10	Descriptive Statistics and comments
Week 11	Definition of normality tests. Review examples on normality tests.
Week 12	Review examples on normality tests.
Week 13	Definitions of Homogeneity of variances. Some reviewed examples.
Week 14	Review examples on Homogeneity of variances
Week 15	General summary of the course.
Week 16-18	**Final Examinations Period**

Requirements
▪ Each student can have only one make-up exam. ▪ One who misses an exam should provide a medical report or a valid excuse within 3 days after the missed exam. ▪ The make-up exam is done at the end of the term and covers all the topics. ▪ No make-up exam is given for the quizzes or term project. ▪ Students who fail to attend the lectures regularly may be given NG grade. ▪ Once the grades are announced, the students have only one week to do objection about their grades. ▪ It is the students' responsibility to follow the announcement in the course web site and mails sent by instructor during the semester.

Background Requirements
▪ No expected background requirement for the course. All students should be able to install the software in their personal computers (latest versions may be better.) Course is designed to benefit any student who deals with data analysis in research.

Method of Assessment				
Evaluation and Grading	**Presentations**	**Reports**	**Class Attendance**	**Final Exam**
Percentage	%30	% 20	5 %	45 %

Grading Criteria *										
A	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**C-**	**D+**	**D**	**D-**	**F**
90 -100	85 - 89	80 - 84	75 - 79	70 - 74	65 - 69	60 - 64	56 - 59	53 - 55	50 - 52	40 - 49	0 – 39

* Letter grades will be decided upon after calculating the averages at the end of the semester and distribution of the averages will play a significant role in the evaluation of the letter grades.

EASTERN MEDITERRANEAN UNIVERSITY

FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Neural Computations
Course Code	ITEC560
Type	Full Time
Semester	Fall/Spring
Category	Area Elective
Workload	240 Hours
EMU Credit	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture
ECTS Credit	8
Course Web Site	lms.emu.edu.tr

Instructor(s)	Prof. Dr. Ahmet Rizaner	**Office Tel**	+90 392 6302480
E-mail	Ahmet.rizaner@emu.edu.tr	**Office No**	CT112

Course Description

This course introduces the basic concepts and techniques of neural computation, and cover basic neural network architectures and learning algorithms, for applications in pattern recognition, image processing, and computer vision. This course also provides practical experience of designing and implementing a neural network for a real world application.

General Learning Outcomes

On successful completion of this course students should be able to:

- Describe what a neural network is;
- Describe the relation between real brains and simple artificial neural network models;
- Discuss the main factors involved in achieving good learning and generalization performance in neural network systems;
- Identify the main implementation issues for common neural network systems;
- Evaluate the practical considerations in applying neural networks to real classification problems.

Teaching Methodology / Classroom Procedures

- The course has three hours of lectures in a week.
- A small, focused project will be done over an approximately one-month period at the end of the semester. Students will form groups of 1, 2 or 3 by self-organization.
- The purpose of the project is to enable the students to get some hands-on experience in the design, implementation and evaluation of neural network algorithms by applying them to real-world problems. The project will be an implementation / examination of some particular aspect of a neural network algorithm, or it will show the application of an algorithm on a particular problem.
- Projects will be presented to the class. The presentation will be approximately 10-15 minutes, with 5 minutes left over for question-and-answer from the class. Slides made in a commonly used format (i.e. PowerPoint) can be used.

- Each student is expected to attend all presentations.
- An electronic copy of the Project Presentation should also be submitted.
- A take home final exam will be given to the students at the end of the semester containing practical questions.
- You must download your Take Home Exam within the designated time period.
- You should submit a 1-2 page long proposal that describes the problem you would like to tackle, objective of the study, proposed algorithms, hardware/software tools and data that you plan to utilize, and evaluation strategies that you plan to use.
- You should get prior approval before starting your project.
- You are free to use any programming language or toolbox but Matlab is strongly recommended.
- You can write the codes yourself or use any code that is available in the public domain. In case you use somebody else's code, you are required to properly cite its source and know the details of the algorithms that the code implements.
- Course related materials will be posted on the course web site (https://staff.emu.edu.tr/ahmetrizaner/en/Pages/ITEC560.aspx).

Course Materials / Main References
Text Book: *Neural Networks and Learning Machines (3rd Edition), Simon S. Haykin, Upper Saddle River: Pearson Education, 2009, ISBN-13:978-0-13-147139-9.*   ***Resource Books:***   1. *Fundamentals of Neural Networks: Architectures, Algorithms and Applications, Laurene V. Fausett, Prentice-Hall, Inc. Upper Saddle River, 1994, ISBN:0-13-334186-0.*   2. *The Essence of Neural Networks (Essence of Computing), Robert Callan, Prentice Hall PTR, 1994, ISBN:013908732X.*   ***Lecture Notes:***   Lecture notes are available on the course web site in PDF format.

Weekly Schedule / Summary of Topics	
Week 1	Introduction
Week 2	Perceptron
Week 3	Multilayer Perceptron
Week 4	Multilayer Perceptron
Week 5	Associative Memory Neural Network
Week 6	Associative Memory Neural Network
Week 7-8	Midterm Examinations
Week 9	Iterative Associative Memory Neural Network
Week 10	Radial Basis Function (RBF) Networks
Week 11	Self-Organizing Future Maps
Week 12	Self-Organizing Future Maps
Week 13	Support Vector Machines
Week 14-15	Final Examinations

Rules and Requirements
• Each student can have only one make-up exam.   • One who misses an exam should provide a medical report within 3 days after the missed exam.   • The make-up exam will be organized at the end of the term after the finals and will cover all the topics.

- No make-up exam will be given for any project or assignment.
- Once the grades are announced, the students have only one week to do objection about their grades.
- It is the students' responsibility to follow the announcement in the course web site.
- Students who do not pass the course and fail to attend the lectures regularly may be given NG grade.
- Students are supposed to submit the assigned tasks on time.

Background Requirements
• Some programming capability is essential. Some open-source neural network design software is available for download from various websites. Familiarity with MATLAB is also desirable. • Some basic mathematics using matrix algebra will be used in this course. There will be some review of the necessary material. • Students who lack an official proof (such as undergraduate transcript) of the required academic background must acquire a written permission from the course instructor for registering the course.

	Method of Assessment		
Evaluation and Grading	**Assignments**	**Projects***	**Final Exam**
Percentage	35%	25 %	40 %

*****Proposal %5, Documentation/Report %10, Presentation 10%.

Grading Criteria :

Letter grades will be decided upon after calculating the averages at the end of the semester. Distribution of the averages will play a significant role in the evaluation of the Letter Grades.

EASTERN MEDITERRANEAN UNIVERSITY

FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Machine Learning
Course Code	ITEC561
Type	Full Time
Semester	Fall/Spring
Category	Area Core
Workload	240 Hours
EMU Credit	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture
ECTS Credit	8
Course Web Site	http:// lms.emu.edu.tr

Instructor(s)	Asst. Prof. Dr. Cem Yağlı	**Office Tel**	+90 392 6301137
E-mail	Cem.yagli@emu.edu.tr	**Office No**	CT119

Course Description

This course studies the theory as well as practical application of the machine learning field. Topics covered include Supervised Learning, Bayesian Networks, Decision Trees, Nearest Neighbor Algorithms, Multi-Layer Perceptron, Support Vector Machines, Markov Models, Statistical Learning Methods, Unsupervised Learning and Reinforcement Learning. The course will also discuss recent applications of machine learning in different domains.

General Learning Outcomes

On successful completion of this course students should be able to:

- Describe what is artificial intelligence, machine learning and deep learning.
- Describe the machine learning ways: Supervised learning, un-supervised learning, and reinforcement learning.
- Discuss the main algorithms and methods that are take place in machine learning studies.
- Describe the popular tools and applications used in machine learning or produced with machine learning.
- Discuss the popular fields of machine learning.

Teaching Methodology / Classroom Procedures

- The course has three hours of lectures in a week.
- Unique research topics about the fields of studies of machine learning will be given to each student. Students will write an essay about their research topics in conference paper format as a term project. They will also present their topics as a homework assignment.

Course Materials / Main References

Text Book:

Machine Learning Crash Course for Engineers, Hossain E., Springer, 2024, ISBN 978-3-031-46989-3.

Resource Books:

1. *435+ Machine Learning Questions, Wanshika A., Prentice-Hall, 2023.*
2. *Machine Learning for Beginners - A Comprehensive Guide to Mastering Algorithms, Data Science, and Artificial Intelligence, Knight R.,2023.*

Lecture Notes:

Lecture notes are available on the course web site in PDF format.

Weekly Schedule / Summary of Topics	
Week 1	Introduction
Week 2-3	Prerequisite Knowledge to learn Machine Learning: Linear Algebra, Statistics, Probability, Calculus, Numeric analysis, Gradient Descent, Activation Functions, Programming.
Week 4-5-6	Evaluation Criteria and Model Selection: Error criteria, Distance Metrics Confusion Matrix, Model and Hyper Parameters, Hyperparameter Space, Hyperparameter Tuning and Model Optimization, Bias and Variance, Overfitting and Underfitting, Model Selection.
Week 7-8-9	Machine Learning Algorithms: Datasets, Categorizations of ML Algorithms, Supervised Learning (Regression, Classification), Deep Learning (Neuron, Back propagation, and Gradient Descent), ANN, CNN, RNN, GAN, transfer learning), Time series forecasting (ARIMA, LSTM), Unsupervised Learning (Clustering, Dimensionality Reduction, Association Learning), Semi-Supervised Learning (SGAN, S-Classification), Reinforcement Learning (Multiarmed bandit problem)
Week 10-11	Associative Memory Neural Network

Rules and Requirements

- Each student can have only one make-up exam.
- One who misses an exam should provide a medical report within 3 days after the missed exam.
- The make-up exam will be organized at the end of the term after the finals and will cover all the topics.
- No make-up exam will be given for any project or assignment.
- Once the grades are announced, the students have only one week to do objection about their grades.
- It is the students' responsibility to follow the announcement in the course web site.
- Students who do not pass the course and fail to attend the lectures regularly may be given NG grade.
- Students are supposed to submit the assigned tasks on time.

Background Requirements

- Some basic mathematics using matrix algebra will be used in this course. There will be some review of the necessary material.

	Method of Assessment			
Evaluation and Grading	**Midterm**	**Assignments**	**Term Project**	**Final Exam**
Percentage	20%	20%	30 %	30 %

*****Proposal %5, Documentation/Report %10, Presentation 10%.

Grading Criteria *											
A	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**C-**	**D+**	**D**	**D-**	**F**
90 -100	85 - 89	80 - 84	75 - 79	70 - 74	65 - 69	60 - 64	56 - 59	53 - 55	50 – 52	40 - 49	0 - 39

* Letter grades will be decided upon after calculating the averages at the end of the semester. Distribution of the averages will play a significant role in the evaluation of the Letter Grades.

EASTERN MEDITERRANEAN UNIVERSITY

FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Ders Adı/Course Title	Natural Language Processing
Ders Kodu/Course Code	ITEC562
Tipi/Type	Full Time
Yarıyıl/Semester	Fall/Spring
Türü/Category	AE (Area Elective)
İş Yükü/Workload	240 Saat/Hours
DAÜ Kredi Değeri/EMU Credit	(3,0,0) 3
Ön Koşul(lar)/Prerequisite	-
Öğretim Dili/Teaching Language	English
Seviye/Level	Graduate
Öğretim Formatı/Teaching Format	3 Hours Lecture per week
AKTS Değeri/ECTS Credit	8
Dersin Web Sitesi/Course Web	http://lms.emu.edu.tr

Instructor(s)	Assoc. Prof. Dr. Emre Özen	**Office Tel**	+90 392 6301358
E-mail	emre.ozen@emu.edu.tr	**Office No**	CT200/T104

Course Description

The goal of this course is to study and apply methods for processing and making sense of text data written in natural language and endow the students with research skills needed in this domain. We will examine the core tasks in natural language processing, including but not limited to language modeling, syntactic analysis, semantic interpretation, and discourse analysis. Additionally, with real-world applications we will solidify the understanding of language models.

Dersin öğrenme Çıktıları/General Learning Outcomes

On successful completion of this course students will be able to:

-

Teaching Methodology

Each student is required to comply with the following:

- The course has three hours of lectures in a week, mainly held in the form of a seminar.
- Lecture notes and laboratory questions are posted on the course web site.
- There is a written midterm exam which covers weeks 1, 2, 3, 4, 5, 6 and 7.
- There is a written final exam which includes all the chapters but mainly the weeks 10, 11, 12, 13, 14 and 15.
- Term project/assignment will be assigned individually at the third week of classes. At the end of the semester, each student should complete and submit the individual term project that is assigned at the beginning of the semester.
- Class attendance is compulsory.

Course Materials / Main References

Course Material:

http://lms.emu.edu.tr

Text Book:

Natural Language Processing with Python: From Basics to Advanced Projects,Second Edition, CUANTUM Technologies,2024. ISBN:979-8-89498-848-3

Haftalık Ders Programı / Konu Özeti - Weekly Schedule / Summary of Topics	
Week 1	**What is NLP?** Definition, scope, importance, challenges, setting up of python environment, end-to-end NLP pipeline
Week 2	**Text Processing** Understanding text data,challenges of textdata, text cleaning:stop word removal, stemming, lemmatization, regular expressions, tokenization
Week 3	**Feature Engineering for NLP** Bag of words,TF-IDF, Word Embeddings, Introduction to BERT
Week 4	**Language Modelling** N-grams, Hidden Markov Models, Recurrent Neural Networks,Long Short-Term Memory Networks
Week 5	**Syntax and Parsing** Parts of Speech Tagging, Named Entity Recognition, Dependency Parsing
Week 6	**Sentiment Analysis** Rule-Based Approaches, Machine Learning Approaches, Deep Learning Approaches
Week 7-8	**Midterm Exams**
Week 9-10	**Topic Modelling** Latent Semantic Analysis, Latent Dirichlet Allocation, Hierarchical Dirichlet Process,
Week 11	**Text Summarization** Extractive Summarization, Abstractive Summarization,
Week 12	**Machine Translation** Sequence to Sequence Models, Attention Mechanisms, Transformer Models
Week 13	**Introduction to Chatbots** What is chatbot? Applications of Chatbots, Tpes of Chatbots(Rule-Based, Self-Learning, Hybrid)
Week 14	**Project: News Aggregator**
Week 15	**Project: Sentiment Analysis Dashboard**
Week 16-18	**Final Exams**

Requirements

At the end of the semester, each student should complete and submit the individual term project that is assigned at the beginning of the semester.

Each student is required to comply with the following:

The course has three hours of lectures in a week mainly held in the form of a seminar.

- Lecture notes are posted on the course web site.
- There is a written midterm exam which covers weeks 1, 2, 3, 4, 5 and 6.
- There is a written final exam which includes all the chapters but mainly the weeks 9,10, 11, 12, 13, 14 and 15.
- Term project/assignment will be assigned individually at the third week of classes.
- Class attendance is compulsory.

The student is responsible to check the course web site regularly and view the latest announcements

Method of Assessment					
Evaluation and Grading	**Assignment**	**Laboratory**	**Class Quizzes**	**Midterm Exam**	**Final Exam**
Percentage	30%	-%	-%	30 %	40 %

NG harf notu hakkındaki Fakülte Kurulu kararı/Faculty Board Decision about NG Grade

- If a student has attended less than 60% of the lecture/lab/tutorial hours for the relevant course, has not taken any exams (midterms, final exams), and has not completed any of the graded course activities (quizzes, homework, projects, lab works, etc.), they will not be able to take make-up exams and will be assigned NG letter grade.
- If a course is repeated, attendance will not be required for that course, but the student will be required to fulfill all course requirements beyond the attendance requirement.

Grading Criteria *											
A	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**C-**	**D+**	**D**	**D-**	**F**
90 -100	85 - 89	80 - 84	75 - 79	70 - 74	65 - 69	60 - 64	56 - 59	53 - 55	50 - 52	40 - 49	0 – 39

* Letter grades will be decided upon after calculating the averages at the end of the semester and distribution of the averages will play a significant role in the evaluation of the letter grades.

EASTERN MEDITERRANEAN UNIVERSITY

FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Neural Networks and Deep Learning
Course Code	ITEC563
Type	Full Time
Semester	Fall
Category	Area Core
Workload	240 Hours
EMU Credit	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture
ECTS Credit	8
Course Web Site	https://lms.emu.edu.tr/course/view.php?id=3005

Instructor(s)	Prof. Dr. Ahmet Rizaner	**Office Tel**	+90 392 630 2480
E-mail	ahmet.rizaner@emu.edu.tr	**Office No**	CT112 / OAT115

Course Description

This course provides a comprehensive introduction to the foundational principles and practical applications of neural networks and deep learning. Key neural network architectures, including single-layer, multi-layer, shallow, and deep networks, will be examined, with a focus on their structure, functionality, and learning rules. Advanced techniques such as convolutional neural networks (CNNs) and recurrent neural networks (RNNs) will be explored in depth. Theoretical insights and hands-on experience will be provided through detailed examples and problem-solving exercises. By the end of the course, students will be equipped with the skills necessary to apply these methods to real-world challenges, enabling them to develop machine learning solutions for a diverse range of industries.

General Learning Outcomes

On successful completion of this course students should be able to:

- Understand the fundamental concepts of artificial intelligence, machine learning, and deep learning.
- Recognize and address challenges and limitations in machine learning, including overfitting, and generalization.
- Describe the structure, operation, and learning rules of neural networks, including various types such as single-layer, multi-layer, shallow, and deep networks.
- Explain and apply advanced techniques for training multi-layer neural networks, including the back-propagation algorithm, cost functions, learning rates, and momentum terms.
- Design and train neural networks for classification tasks, including binary and multiclass classification, and evaluate network performance using metrics and activation functions.
- Understand Convolutional Neural Networks (CNNs) and their applications.
- Design and implement Recurrent Neural Networks (RNNs) for sequential data.

- Apply machine learning solutions to real-world problems.

Teaching Methodology / Classroom Procedures
• The course has three hours of lectures a week. • Only one make-up exam will be given for the missing exams. • No make-up will be given for the project. • Students are supposed to submit the assigned tasks on time. • Course related materials will be posted on the course's learning platform.

Course Materials / Main References

Text Books:

1. *Deep Learning Foundations and Concepts, Christopher M. Bishop, Hugh Bishop, Springer Cham, 2023, ISBN: 978-3-031-45467-7*
2. *MATLAB Deep Learning with Machine Learning, Neural Networks and Artificial Intelligence, Phil Kim, Apress Berkeley, 2017, ISBN: 978-1-4842-2844-9*
3. *Deep Learning, Ian Goodfellow, Yoshua Bengio and Aaron Courville, The MIT Press, 2016, ISBN: 978-0262035613*

Lecture Notes:

Lecture notes are available on the course web site in PDF format.

Weekly Schedule / Summary of Topics	
Week 1	**Introduction**
Week 2	**Machine Learning** The fundamental concepts and definitions of artificial intelligence, machine learning, and deep learning are examined in this topic, with emphasis on their interrelationships. The challenges and limitations of machine learning, including overfitting, generalization, and data quality, are introduced. The core principles of machine learning are explored, focusing on how data is utilized by computers for decision-making. Key areas such as supervised, unsupervised, and reinforcement learning are discussed. Practical applications are reviewed, along with the processes of model training and validation for real-world scenarios.
Week 3	**Neural Networks** The basics of neural networks, central to deep learning, are covered in this topic. The structure, operation, and learning rules of neural networks are explained, including their simulation of brain functions. Different types of neural networks, such as single-layer, multi-layer, shallow, and deep networks, are introduced. Core concepts, including neurons, weights, and activation functions, are discussed, providing a foundation for understanding how neural networks are trained to recognize patterns and make predictions.
Week 4-5	**Training of Multi-Layer Neural Networks** Advanced techniques for training multi-layer neural networks, essential for deep learning, are explored in this topic. The back-propagation algorithm, a key learning rule, is explained. The impact of cost functions, learning rates, and momentum terms on network performance and convergence is introduced. The training process of multi-layer networks is examined, focusing on error propagation and weight adjustment for performance enhancement. Key topics include cost functions, gradient descent, and methods for preventing overfitting. By the end of this topic, an understanding of the complexities involved in training and optimizing deep networks will be achieved.
Week 6-7	**Neural Networks and Classification** The application of neural networks to classification tasks, a core aspect of machine learning and deep learning, is covered in this topic. The design and training of neural networks for

	classifying input data into different categories are explained. Concepts of binary and multiclass classification, as well as methods for evaluating network accuracy and performance, are introduced. The use of activation functions such as sigmoid and SoftMax, decision boundaries, and the learning process for distinguishing between classes are explored. Real-world examples like image recognition and spam detection are used to illustrate these concepts. Methods for evaluating the classification performance of neural networks are also discussed.
Week 8	**Deep Learning** Innovations and advancements in deep neural networks, a leading technique in machine learning and deep learning, are covered in this topic. Drivers and solutions enhancing deep learning performance across various fields are explained. Key techniques such as the ReLU function and dropout are introduced. The topic explores how deep learning utilizes multi-layer neural networks to model complex data patterns. The structure of deep networks, their ability to extract high-level features, and the benefits of deeper architectures for tasks like image recognition and natural language processing are discussed. Key concepts including activation functions, regularization techniques, and optimization methods are also covered.
Week 8-10	**Midterm Exam**
Week 11	**Convolutional Neural Networks** The architecture and functionality of convolutional neural networks (CNNs), a prominent technique in deep learning, are explored in this topic. The convolutional and pooling layers, essential components of CNNs, are explained. The application of CNNs to image recognition and other tasks is introduced. The unique structure of CNNs, including convolutional layers, pooling layers, and fully connected layers, is discussed, with a focus on how these networks automatically detect spatial patterns and features. Key concepts such as filters, stride, padding, and feature maps are covered, along with practical applications in image classification, object detection, and computer vision. Advanced CNN architectures like AlexNet and VGGNet are also examined.
Week 12	**Recurrent Neural Networks** Recurrent Neural Networks (RNNs), designed for sequential data such as time series, text, or speech, are covered in this topic. The use of loops in RNNs to retain information from previous inputs and capture dependencies in sequences is explained. Key concepts including hidden states, the vanishing gradient problem, and advanced architectures such as Long Short-Term Memory (LSTM) and Gated Recurrent Units (GRU) are introduced. Practical applications of RNNs, including language modeling, text generation, and time-series prediction, are explored.
Week 13-14	**Presentations**
Week 15-17	**Final Examinations**

Requirements
• Some programming capability is essential. Some open-source neural network design software is available for download from various websites. Familiarity with MATLAB, Python, or Octave is also desirable. • Some basic mathematics using matrix algebra will be used in this course. There will be some review of the necessary material. • Two small, focused projects will be conducted over an approximately one-month period at the end of the semester. • The purpose of these projects is to enable students to gain valuable experience in researching and designing, implementing, and evaluating deep neural network algorithms by applying them to real-world problems. These projects will involve either an in-depth investigation and implementation of a specific aspect of a neural network algorithm or the application of an existing algorithm to a novel or challenging real-world problem • Students are free to use any programming language or toolbox, but MATLAB, Python, or Octave is

strongly recommended.

- Students can write the codes themselves or use any code that is available in the public domain. In case they use somebody else's code, they are required to properly cite its source and know the details of the algorithms that the code implements.
- Students will conduct independent research on a deep learning architecture of their choice and present their findings to the class. The presentation will be approximately 15-120 minutes, with 5 minutes left over for questions and answers from the class. Slides made in a commonly used format (i.e., PowerPoint) can be used.
- Each student is expected to attend all the presentations.
- An electronic copy of the Project Presentation should also be submitted.
- Each student can have only one make-up exam. Students who miss an exam should provide a medical report within 3 days after the missed exam. The make-up exam will be organized at the end of the term after the finals and will cover all topics.
- Once the grades are announced, students have only one week to object to their grades.
- It is the students' responsibility to follow announcements on the course website.
- Students who do not pass the course and fail to attend lectures regularly may be given an NG grade.

	Method of Assessment			
Evaluation and Grading	**Project**	**Presentation**	**Midterm**	**Final Exam**
Percentage	25%	15%	25%	35%

Grading Criteria
Letter grades will be decided upon after calculating the averages at the end of the semester. Distribution of the averages will play a significant role in the evaluation of the Letter Grades.

Project Details
Focused projects will be conducted over an approximately one-month period at the end of the semester. The purpose of these projects is to enable students to gain valuable experience in researching and designing, implementing, and evaluating deep neural network algorithms by applying them to real-world problems. These projects will involve either an in-depth investigation and implementation of a specific aspect of a neural network algorithm or the application of an existing algorithm to a novel or challenging real-world problem. Students can select data sets from the list of data resources available. Students are free to use any programming language or toolbox, although Python, MATLAB, or Octave are strongly recommended. Students may write their own code or utilize code available in the public domain. If using code written by others, proper citation of the source is required, and students must thoroughly understand the algorithms implemented within the code. Students should submit a readable and well-organized report that provides proper motivation for the task, discussion of related literature, proper explanation of the details of the approach and implementation strategies, proper performance evaluation, and detailed discussion of the results. The reports are expected to be 6-8 pages and must be submitted as a PDF.

Presentation Details
Students will conduct independent research on a deep learning architecture of their choice and present their findings to the class. The presentation will be approximately 15-120 minutes, with 5 minutes left over for

questions and answers from the class. Slides made in a commonly used format (i.e., PowerPoint) can be used. Each student is expected to attend all the presentations. An electronic copy of the Project Presentation should also be submitted.

The presentation will be evaluated on the following items:

- Appearance of presentation
- Organization of presentation
- Description of project and stating the objectives
- Relevant background material
- Description of methodology
- Description of implementation issues
- Comments on the results
- Duration of presentation
- Individual performance
- Response to questions/question handling

EASTERN MEDITERRANEAN UNIVERSITY

FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Mobile Ad Hoc Networks
Course Code	ITEC578
Type	Full Time
Semester	Fall/Spring
Category	Area Elective
Workload	240 Hours
EMU Credit	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture
ECTS Credit	8
Course Web Site	lms.emu.edu.tr

Instructor(s)	Assoc. Prof. Dr. Emre Özen	**Office Tel**	+90 392 6301358
E-mail	emre.ozen@emu.edu.tr	**Office No**	CT108

Course Description

An ad hoc network is an infrastructure-less wireless network that can be formed spontaneously. These networks are mainly used by researchers, emergency services and military. A mobile ad-hoc network (MANET), is a type of ad hoc network that can change locations and configure itself spontaneously. On a MANET mobile devices communicate directly with one another. MAC layer protocols, routing protocols, multicast routing protocols, transport layer routing protocols, energy management in ad hoc wireless networks and recent developments in mobile ad-hoc networks will form the main concept of this course. Recent publications and researches about MANETs will be discussed throughout the semester

General Learning Outcomes

On successful completion of this course students should be able to:

- understand the recent protocols used in any layer of mobile ad-hoc networks.
- know about the hot topics that are suitable for making research
- know about the design issues of each protocol layer for mobile ad hoc networks
- make research about publications on any topic.

Teaching Methodology / Classroom Procedures

- The course has three hours of lectures in a week.
- Class attendance is compulsory.
- Only one make-up exam will be given for the missing exams.
- Make-up exam will be given after the final exams.
- No make-up will be given for the project.
- Students are supposed to submit the assigned tasks on time.
- Course related materials will be posted on the course web site.
- Work on individual projects: A research on a selected topic by the students including the coding for a simulation application using NS3 and presenting it at the end of the semester is a requirement.
- Final exam is conducted as a written exam that may contain short answer and writing essay questions.

Course Materials / Main References
Text Book:
Subir Kumar Sarkar, T. G. Basavaraju, C. Puttamadappa, Ad Hoc Mobile Wireless Networks,Auberbach Publications, Feb 2013, ISBN:978-1466514461
Lecture Notes:
-

Weekly Schedule / Summary of Topics	
Week 1	Fundamentals of Wireless Networks: What are Ad Hoc Networks?
Week 2	What is MAC Layer Protocol for Ad Hoc Wireless Networks
Week 3	Selected MAC Layer Protocols for Ad Hoc Wireless Networks
Week 4	What is Routing Protocol for Ad Hoc Wireless Networks?
Week 5	Selected Routing Protocols for Ad Hoc Wireless Networks
Week 6	What is Multicast Routing Protocol for Mobile Ad Hoc Networks?
Week 7-8	Selected Multicast Routing Protocols for Mobile Ad Hoc Networks
Week 9	What is Transport Protocol for Ad Hoc Networks?
Week 10	Selected Transport Protocols for Ad Hoc Networks
Week 11	Applications and Recent Developments in Ad Hoc Networks
Week 12	Applications and Recent Developments in Ad Hoc Networks
Week 13	Projects presentations by students
Week 14-15	Final Examinations

Rules and Obligations
• Each student can have only one make-up exam. One who misses an exam should provide a medical report within 3 days after the missed exam. The make-up exam will be organized at the end of the term after the finals and will cover all the topics. No make-up exam will be given for any assignment. • Once the grades are announced, the students have only one week to do objection about their grades. • It is the students' responsibility to follow the announcement in the course web site. • Students who do not pass the course and fail to attend the lectures regularly may be given NG grade.

Background Requirement
• Students are expected to have a basic knowledge about network topologies, communication protocols like TCP/IP and OSI Model at minimum undergraduate level. • Students who lack an official proof (such as undergraduate transcript) of the required academic background must acquire a written permission from the course instructor for registering the course.

	Method of Assessment		
Evaluation and Grading	**Project**	**Midterm Exam**	**Final Exam**
Percentage	40 %	-	60 %

Grading Criteria *											
A	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**C-**	**D+**	**D**	**D-**	**F**
90 - 100	85 - 89	80 - 84	75 - 79	70 - 74	65 - 69	60 - 64	56 - 59	53 - 55	50 - 52	40 - 49	0 - 39

* Letter grades will be decided upon after calculating the averages at the end of the semester and distribution of the averages will play a significant role in the evaluation of the letter grades.

EASTERN MEDITERRANEAN UNIVERSITY

FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Wireless Networking
Course Code	ITEC579
Type	Full Time
Semester	Fall/Spring
Category	Area Elective
Workload	240 Hours
EMU Credit (Lec, Lab, Tut)	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture
ECTS Credit	8
Course Web Site	http://staff.emu.edu.tr/alihakanulusoy

Instructors(s)	Prof. Dr. Ali Hakan Ulusoy	**Office Tel**	2881
e-mail	alihakan.ulusoy@emu.edu.tr	**Office No.**	CT 108

Course Description

This course provides a hands-on guide to planning, designing, installing and configuring wireless LANs. The course offers in-depth coverage of wireless networks with extensive step-by-step coverage of IEEE 802.11b/a/g/n implementation, design, security, and troubleshooting.

General Learning Outcomes

On successful completion of this course students should:

- Describe how wireless technology is used in daily activities
- Describe the different IEEE WLAN standards
- Explain the principals of radio wave transmissions
- List and describe the wireless modulation schemes used in IEEE WLANs
- Explain the MAC procedures for joining, transmitting, and remaining connected to a WLAN
- Explain the steps for planning a wireless network
- Describe how to perform a site survey
- Explain the basic security protections for IEEE 802.11 WLANs
- List wireless security solutions
- Explain the procedures for maintaining a wireless network
- List troubleshooting techniques for solving RF transmission problems
- Describe the features of a wireless personal area network, a wireless metropolitan area network, and a wireless wide area network
- Explain the newest wireless networking technologies
- Conduct research about a wireless networking topic and present its findings

Teaching Methodology / Classroom Procedures

- Final exam is conducted as a written exam that may contain multiple choice questions, true/false questions, fill in the blanks questions and short answer questions.
- For the project / presentation, the students need to choose one paper from any source such as IEEE journals and/or conference proceedings. It is required that the students inform the instructor which

papers they have chosen for the presentation and seek their approval. Grades will be based on clarity of presentation, understanding of the key concepts, describing the research contained in the paper, and answering the questions from the audience. There will no teaming opportunities.

- Students are expected to carry out the assigned readings, and submit assignments.
- Students are encouraged to use internet to search for various related topics.
- Only one make-up exam will be given for the missing exams.
- Make-up exam will be given after the final exams.
- No make-up will be given for the project.
- Supplementary information for the course is available at http://staff.emu.edu.tr/alihakanulusoy. The Web site contains class notes, class announcements, the course syllabus, exam dates, and other information for the course.

Course Materials / Main References
Text Book:
Mark Ciampa, *CWNA Guide to Wireless LANs, Second Edition*, Course Technology Incorporated, 2006, ISBN 0-619-21579-8.
Resource Books:
1. Pejman Roshan, Jonathan Leary, *802.11 Wireless LAN Fundamentals*, Cisco Press, 2003. 2. Mark Ciampa, *Designing and Implementing Wireless LANs*, Course Technology, 2001. 3. Theodore S. Rappaport, *Wireless Communications: Principles and Practice*, Prentice Hall, 2001.
Lecture Notes:
All course materials are also available online in Adobe PDF (Portable Document Format).

Weekly Schedule / Summary of Topics	
Week 1	**It's a Wireless World:** A Day in the Life of a Wireless User, A Look at Wireless Technologies, Wireless LAN Applications, Wireless Advantages and Disadvantages **Wireless LAN Devices and Standards:** WLAN Devices, Understanding Standards, Wireless Standards Organizations and Regulatory Agencies, Types of WLANs
Week 2	**How Wireless Works:** Radio Wave Transmission Principles, Radio Frequency Behavior and Measurement, Antennas
Week 3	**IEEE 802.11 Physical Layer Standards:** Wireless Modulation Schemes, IEEE 802.11 Physical Layer Standards
Week 4	**IEEE 802.11 Medium Access Control and Network Layer Standards:** IEEE WLAN Configurations, IEEE 802.11 MAC Layer Standards, WLAN Network Layer Standards
Week 5	**Planning and Building a Wireless LAN:** Planning for a Wireless Network, Designing the WLAN, Deploying a Wireless Network, Providing User Support **Conducting a Site Survey:** What Is a Site Survey?, Performing a Site Survey
Week 6	**Wireless LAN Security and Vulnerabilities:** Security Principles, Basic IEEE 802.11 Security Protections, Vulnerabilities of IEEE 802.11 Security, Other Wireless Attacks **Implementing Wireless LAN Security:** Wireless Security Solutions, Transitional Security Model, Personal Security Model, Personal Security Model, Enterprise Security Model
Week 7	**Managing a Wireless LAN:** Monitoring the Wireless Network, Maintaining the Wireless Network, Establishing a Wireless Security Policy
Week 7-8	Midterm Examinations
Week 9	**Network Settings and Wireless LAN Troubleshooting:** Wired Network Settings for Wireless Connections, Troubleshooting Wireless Networks
Week 10	**Personal, Metropolitan, and Wide Area Wireless Networks:** Wireless Personal Area Networks, Wireless Metropolitan Networks, Wireless Wide Area Networks, The Future of Wireless Networks
Week 11	Project Presentations

Week 12	Project Presentations
Week 13	Project Presentations
Week 14 - 15	Final Examinations

Rules and Obligations
▪ Each student can have only one make-up exam. One who misses an exam should provide a medical report within 3 days after the missed exam. The make-up exam will be organized at the end of the term after the finals and will cover all the topics. No make-up exam will be given for any quiz or assignment. ▪ Once the grades are announced, the students have only one week to do objection about their grades. ▪ It is the students' responsibility to follow the announcement in the course web site. ▪ Students who do not pass the course and fail to attend the lectures regularly may be given NG grade.

Background Requirements
▪ Students are expected to have a networking background at minimum undergraduate level for registering the course. ▪ Students who lack an official proof (such as undergraduate transcript) of the required academic background must acquire a written permission from the course instructor for registering the course.

Method of Assessment			
Evaluation and Grading	**Assignments**	**Project / Presentation**	**Final Exam**
Percentage	30 %	30 %	40

Grading Criteria :
Letter grades will be decided upon after calculating the averages at the end of the semester. Distribution of the averages will play a significant role in the evaluation of the Letter Grades.

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FACULTY OF COMPUTER AND INFORMATION SCIENCES

INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Architecture and Hardware
Course Code	ITEC582
Type	Full Time
Semester	Fall/Spring
Category	Area Elective
Workload	240 Hours
EMU Credit	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture per week
ECTS Credit	8
Course Web Site	http://staff.emu.edu.tr/husnubayramoglu

Instructor(s)	Asst. Prof. Dr. Hüsnü Bayramoğlu	**Office Tel**	+90 392 6302894
E-mail	husnu.bayramoglu@emu.edu.tr	**Office No**	CT100

Course Description

The course provides the study of the structure, characteristics and operation of modern day computer systems including a basic background on the computers evolution, its design process and its internal characteristics which includes processor components, control unit architecture, memory organization and system organization. The concept of reduced instruction set computers (RISC), superscalar processors and superpipelining is explained in detail. The benefits of parallel processing and multicore processors are considered.

General Learning Outcomes

On successful completion of this course students should be able to:

- Describe design principles for different instruction sets
- Discuss different register organizations
- Identify processor and register organizations
- Describe instrcution pipelining and identify pipeline hazards
- Discuss RISC/CISC processors
- Explain superscalar exeeution and superpipeline approaches
- Identify symmetric multiprocessors and cache coherency protocols
- Discuss Cluster and NUMA organizations
- Describe multiple processor organizations
- Discuss multicore organizations
- Have the necessary knowledge of related research literature

Teaching Methodology / Classroom Procedures

- The course has three hours of lectures in a week mainly held in the form of a seminar.
- There is no lab works or tutorials.
- There are two/three written quizzes and one written final exam.
- The quizzes and exams are conducted as a written exam that may contain multiple choice, fill in the blanks, short answer and writing essay questions.
- There is an individual term project.
    - You should find a recent conference/journal paper (published in the last 5 years) related to Computer

Architecture and Hardware.
    - The selected paper should be sent as an e-mail to husnu.bayramoglu@emu.edu.tr and wait for the confirmation.
    - Once the topic is confirmed, you can start studying the topic and prepare a written report.
    - The printed report should be submitted before the announced deadline.
    - Late submissions are not accepted.
    - Project grade is out of 25%.
    - The report should be between 3500-4000 words with the format provided in the report template on the web site.
    - Turnitin plagiarism test must be obtained before submission.
    - The plagiarism test result should be less than 20%.
    - No reports are accepted for consideration with higher plagiarism test result.
    - An account will be created for you to make the plagiarism test through Turnitin.
    - The work done for the project should be presented.
    - The duration of the presentation is about 15 minutes for each student.
    - Presentation grade is out of 10%.
- Class attendance is compulsory.
- Lecture notes are available on the course web site.
- Course related materials will be posted on the course web site.

Course Materials / Main References
Text Book:
William Stallings, Computer Organization and Architecture-Designing for Performance, Ninth Edition, Pearson Higher Education, 2013. ISBN 13: 978-0-13-293633-0

Weekly Schedule / Summary of Topics	
Week 1	ARM Data Types, Intel X86 Data Types
Week 2	Variable Length Instructions: PDP-11 Instruction Format, Intel x86 Instruction Format
Week 3	Register Organizations, Pipelining, Pipeline Hazards
Week 4	Instruction Execution Policies, RISC/CISC Processors
Week 5	Instruction Issue Policies
Week 6	Superscalar Execution, Superpipelining
Weeks 7-8	Midterm Examinations
Weeks 9-10	Symmetric Multiprocessors, Cache Coherency Protocols, Cluster Computer Architectures
Week 11	CC-NUMA (Cache Coherent Non-Uniform Memory Access) Organizations
Week 12	Multicore Organizations
Week 13	Presentations for Term Projects
Week 14	Presentations for Term Projects
Week 15	Presentations for Term Projects
Weeks 16-18	Final Examinations

Rules and Obligations
• Each student can have only one make-up exam. One who misses an exam should provide a medical report within 3 days after the missed exam. • The make-up exam will be organized at the end of the term after the finals and will cover all the topics. • No make-up will be given for any quiz, project, presentation or assignment. • Once the grades are announced, the students have only one week to do objection about their grades. • It is the students' responsibility to follow the announcement in the course web site.

Background Requirements
• Students are expected to have a computer hardware background at minimum undergraduate level for registering the course. • Students who lack an official proof (such as undergraduate transcript) of the required academic background must acquire a written permission from the course instructor for registering the course.

	Method of Assessment		
Evaluation and Grading	**Term Project**	**Quizzes**	**Final Exam**
Percentage	35 %	15 %	50 %

Grading Criteria *										
A	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**C-**	**D+**	**D**	**D-**	**F**
90 - 100	85 - 89	80 - 84	75 - 79	70 - 74	65 - 69	60 - 64	56 - 59	53 - 55	50 - 52	40 - 49	0 - 39

* Letter grades will be decided upon after calculating the averages at the end of the semester and distribution of the averages will play a significant role in the evaluation of the letter grades.

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INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Risk Management for IT Projects
Course Code	ITEC584
Type	Full Time
Semester	Fall/Spring
Category	Elective
Workload	240 Hours
EMU Credit (Lec, Lab, Tut)	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lecture
ECTS Credit	8
Course Web Site	https://staff.emu.edu.tr/mustafailkan/en/teaching/itec584

Instructors(s)	Prof. Dr. Mustafa Ilkan	**Office Tel**	1245
e-mail	Mustafa.ilkan@emu.edu.tr	**Office No.**	CT 204

Course Description

This course aims to provide a full understanding of the management roles, responsibilities and techniques needed to manage risks in IT projects.

General Learning Outcomes

On successful completion of this course students will have understanding of:

- Comprehensive knowledge regarding certain and uncertain risks that can occur in while dealing with IT projects.
- The course will equip students with skills to effectively identify, analyze, and mitigate such risk to successfully achieve their project goals.
- Advance knowledge of risk assessment, analysis, and reducing techniques.
- Risk management standards.

Teaching Methodology / Classroom Procedures

- Class quizzes will be taken once in a month. The quizzes are from each chapter and are organized every month from the covered topics.
- Students are required to present any chapter from the course either individually or in a group. The aim is to create a collaborative medium and create discussions.
- Students will also be assign a technical project related to any IT system (chosen by students) e.g. a static website, e-commerce/dynamic website, end-user system, online system etc
    - Students are encouraged to use internet to search for more information.
    - Student must comply with risk management guidelines and standards and must use tools such as Microsoft Excel or Word to generate report and design necessary risk management tables and figures.
    - The purpose to be to analyze students understanding and knowledge gained from the course as well as their capability to utilize this knowledge in the professional world.

- Project report will be based on professional risk management report formats used in organization.
- Project must be submitted before the deadline.

- Final exam is conducted as a written exam that may contain multiple choice questions, true/false questions, fill in the blanks questions and essay questions.
- Make-up exam will be given after the final exams.
- Supplementary information for the course is available at http://staff.emu.edu.tr/mustafailkan/en/teaching/itec584. The Web site contains class notes, class announcements, the course syllabus, exam dates, and other information for the course.

Course Materials / Main References
Text Book: Risk Management for IT Projects, Bennet P. Lientz, Lee Larssen ***Resource Books:*** Principles of Risk Management and Insurance, Eleventh Edition, George E. Rejda ***Lecture Notes:*** All course materials are also available online in Adobe PDF (Portable Document Format).

Weekly Schedule / Summary of Topics	
Week 1	Chapter 1 - INTRODUCTION
Week 2	Chapter 2 - Effective Issues Managements and Coordination
Week 2	Chapter 3 - Analysis and Measurements of Issues and Risk
Week 3	Chapter 4 - Teams
Week 3	Chapter 5 - The Work
Week 4	Chapter 6 - Business Unit
Week 4	Chapter 7 - Management
Week 5	Chapter 8 - Projects
Week 5	Chapter 9 - Resistance to Change
Week 6	Chapter 10 - Vendors, Consultants and Outsourcing
Week 6	Chapter 11- Headquarters
Week 7	Chapter 12-Technology
Week 7	Chapter 13- IT Strategic Plan
Week 8	Chapter 14- Analysis
Week 8	Chapter 15 - Software Packages
Week 9	Chapter 16 – Development
Week 9	Chapter 17 – Implementation
Week 10	Chapter 18 - Operations and Support
Week 11	Final Exam

Rules and Obligations
▪ Each student can have only one make-up exam. One who misses an exam should provide a medical report within 3 days after the missed exam. The make-up exam will be organized at the end of the

term after the finals and will cover all the topics. No make-up exam will be given for any quiz or assignment.

- Once the grades are announced, the students have only one week to do objection about their grades.
- It is the students' responsibility to follow the announcement in the course web site.
- Students who do not pass the course and fail to attend the lectures regularly may be given NG grade.

Background Requirements
▪ Students are expected to be enrolled in Master's program. ▪ Students who lack an official proof (such as undergraduate transcript) of the required academic background must acquire a written permission from the course instructor for registering the course.

Method of Assessment			
Evaluation and Grading	**Quiz**	**Project / Presentation**	**Final Exam**
Percentage	20 %	40%	40%

Grading Criteria :
Letter grades will be decided upon after calculating the averages at the end of the semester. Distribution of the averages will play a significant role in the evaluation of the Letter Grades.

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INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Applied Recommender Systems via Artificial Intelligence
Course Code	ITEC597
Type	Full Time
Semester	Fall/Spring
Category	Area Elective
EMU Credit	(3,0,0) 3
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	3 Hours Lectures per week
ECTS Credit	8 What is ECTS? Why ECTS is needed? How does it work?
Workload	240 Hours
Course Web Site	http://lms.emu.edu.tr

Instructor	Assist. Prof. Dr. Cem Yağlı	**Office Tel**	+90 392 6301137
E-mail	Cem.yagli@emu.edu.tr	**Office No**	CT 109

Course Description

This course is aiming to introduce the students to the recommendation systems (RS), their well-known applications, the frameworks, tools, and programming languages (LISP / Prolog) used in the development of these applications. Students are also going to have general understanding about the related theory of artificial intelligence studies which the RS applications are built on. The course is also going to cover, phases of the recommendation systems, information learning, recommendation filtering techniques. Searching state spaces, multiagent searching techniques, propositional logic, first-order logic, machine learning (The inductive view), neural networks (Computational graphs, optimization in directed acrylic graphs, backpropagation application), domain specific neural architectures, unsupervised learning (Dimensionality reduction and matrix factorization, clustering), reinforcement learning (Stateless algorithms, reinforcement learning framework, Monte Carlo sampling, Bootstrapping and temporal difference learning, policy grading methods), probabilistic graphical models, knowledge graphs, integrated reasoning and learning.

General Learning Outcomes

On successful completion of this course, students will be able to:

- explain fundamentals of RS.
- discuss the well-known applications, frameworks, tools and programming languages.
- discuss the related theory of artificial intelligence studies.
- explain reliable the phases of RS, information learning, recommendation filtering techniques.
- explain researching state spaces, multiagent searching techniques, propositional logic, machine learning, neural networks, domain specific neural architectures, unsupervised learning, reinforcement learning.
- explain the probabilistic graphical models, knowledge graphs, integrated reasoning, and learning.

Teaching Methodology / Classroom Procedures

- The course has three hours of online lectures in a week.
- There is no lab works or tutorials.
- There is one online midterm exam and one online final exam.
- Chapters included in the exams will be posted on the course web site during the semester.
- There is an individual term project.

- Class attendance is compulsory.
- Lecture notes are available on the course web site.

Course Materials / Main References
Text Book: Kim Falk, Practical Recommender Systems, (2019), Manning Publications Co., ISBN: 978-1617292705.

Weekly Schedule / Summary of Topic	
Week 1-6	Getting ready for recommender systems • What is recommender? • User behavior and how to collect it. • Monitoring the system • Ratings and how to calculate them. • Non-personalized recommendations • The user (and content) who came in from the cold.
Week 7	**Chapters will be Overviewed and Midterm exam will be done**
Week 8-14	Recommender algorithms • Finding similarities among users and among content • Collaborative filtering in the neighborhood • Evaluating and testing your recommender • Content-based filtering • Finding hidden genres with matrix factorization • Taking the best of all algorithms: Implementing hybrid recommenders • Ranking and learning to rank • Future of recommender systems
Week 16-17	**Final Examinations**

Rules and Obligations
• Each student can have only one make-up exam. • One who misses an exam should provide a medical report within 3 days after the missed exam. • The make-up exam will be organized at the end of the term after the finals and covers all the topics. • Once the grades are announced, the students have only one week to do objection about their grades. • Students who fail to attend the lectures regularly may be given NG grade. • The student is responsible to check the course web site regularly and view the latest announcements.

Background Requirements
• Students are expected to have a networking background at minimum undergraduate level for registering the course. • Students who lack an official proof (such as undergraduate transcript) of the required academic background must acquire a written permission from the course instructor for registering the course.

	Method of Assessment			
Evaluation and Grading	**HWs**	**Term Project**	**Midterm Exam**	**Final Exam**
Percentage	20%	30 %	20 %	30 %

Grading Criteria *											
A	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**C-**	**D+**	**D**	**D-**	**F**
90 - 100	85 - 89	80 - 84	75 - 79	70 - 74	65 - 69	60 - 64	56 - 59	53 - 55	50 - 52	40 - 49	0 - 39

* Letter grades will be decided after calculating the class average at the end of the semester and distribution of the grades will play a significant role in the evaluation.

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INFORMATION TECHNOLOGY

COURSE POLICY SHEET

Course Title	Seminar
Course Code	ITEC598
Type	Full Time
Semester	Fall/Spring
Category	Area Core
EMU Credit	(0,0,0) 0
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	Weekly meetings with supervisor
ECTS Credit	4 What is ECTS? Why ECTS is needed? How does it work?
Workload	120 Hours

Course Description
The aim of the seminar course is to improve the student's skills in conducting research in an area of interest for the student, preferably a topic related to the thesis work, and reporting the research findings both verbally and in writing. In the application of the seminar course, the student, under the supervision of the thesis supervisor/course coordinator, specifies a topic, conducts a literature review, and prepares a written report and an oral presentation taking into consideration techniques for scientific research and research and publication ethics.

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COURSE POLICY SHEET

Course Title	Term Project
Course Code	ITEC599
Type	Full Time
Semester	Fall/Spring
Category	Area Core
EMU Credit	(0,0,0) 0
Prerequisite	-
Language	English
Level	Graduate
Teaching Format	Weekly meetings with supervisor
ECTS Credit	20 What is ECTS? Why ECTS is needed? How does it work?
Workload	600 Hours
Course Web Site	https://sct.emu.edu.tr/en/itec599-term-project

List of Supervisors			
Name and Surname	**E-mail**	**Office No**	**Office Tel**
Prof. Dr. Ahmet Rizaner	ahmet.rizaner@emu.edu.tr	CT112	+90 392 6302480
Prof. Dr. Ali Hakan Ulusoy	alihakan.ulusoy@emu.edu.tr	CT118	+90 392 6302881
Prof. Dr. Nazife Dimililer	nazife.dimililer@emu.edu.tr	CT200	+90 392 6301246
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Dr. Şensev İlkan	sensev.alicik@emu.edu.tr	CT110	+90 392 6301665
Dr. Yeşim Kapsıl Çırak	yesim.kapsil@emu.edu.tr	CT216	+90 392 6302310

Guidance for Term Project

What is Term Project?

1. Term project should include identification of problem, formulation of hypothesis, search and review of literature, exposure to recent advances, data collection, critical analysis, interpretation of results and drawing conclusions.
2. Term project report should provide a literature review of the related area and explain the nature of the problem to be investigated. It should provide a clear summary of the project background, relevance and main contributions.

Supervisor Appointment and Project Proposal

1. Find a supervisor and fill the Project Supervisor Co-Supervisor Appointment Form. This form is used to represent the agreement between the supervisor and student to work together on ITEC599-Term Project. The deadline for submitting the form is determined by the last day for add/drop of the academic semester.

2. Agree on a project topic with your supervisor, fill the Master's Project Proposal Form, submit it to the Departmental Graduate Committee and wait for the approval of your project topic. The deadline for submitting the form is determined by the last day for add/drop of the academic semester. Once your topic is approved, you can start your term project studies.

Project Report

1. A project report must be written according to the report format.
2. The length of the report should be between 60 and 100 pages, excluding the cover page, approval page, abstract, dedication, acknowledgement, table of contents, list of tables, list of figures, list of abbreviations and appendix.
3. Turnitin plagiarism test result must be obtained before submitting the report to the jury members.
4. Test result must be less than 20% where each similarity index cannot exceed 5%.
5. Turnitin plagiarism test result page must be attached as the last page of the project report before submission.
6. The deadline for submitting the report is 2 weeks before the last day for submitting the letter grades of the academic semester.
7. 3 copies of the report must be submitted to 3 jury members, 1 week before the project defense date.
8. Reports submitted after the deadline will not be accepted. Students who submit their reports after the deadline receives PP (Project Progressing) letter grade. In this case, student should register ITEC599-Term Project in the next following semester to continue and complete the project.

Project Defense (Presentation)

1. Project defense is done against 3 jury members consists of Information Technology Master's Program academic staff.
2. Supervisor determines the names of the jury members and fill the Jury Report for the Project Defense Form accordingly.
3. Jury members take one of the following decisions after the defense of the student:
   - Approved: The Jury judges that the candidate has satisfactorily completed the Term Project work.
   - Approved upon alteration: The Jury judges that the candidate should resubmit the Term Project to the jury members with the required alterations, within not more than two weeks.
   - Rejected: The Jury judges that the candidate has not satisfactorily completed the Term Project work.

After Defense

1. If the project study is "approved" by the jury members or if the jury decision is "approved upon alteration" and student makes the necessary corrections on time study, then hard-covered project reports must be prepared by the student to collect the signatures for the approval page.
2. 3 copies of the hard-covered reports must be prepared where 1 copy will be submitted to the student, 1 copy to the supervisor and 1 copy goes to the departmental library.
3. Each copy of the hard-covered reports must contain a CD containing the soft copy of the report, attached to the last page of the report.
4. If the project study is rejected by the jury members or if the jury decision is "approved upon alteration" and student cannot make the necessary corrections on time study, then the project study must be repeated.

General Learning Outcomes
On successful completion of the project students should be able to: • Summarize major themes in their area of specialization • Identify areas where ethical issues may arise • Act as expert and developer in their fields of speciality • Understand the foundations of the chosen minor subject • Have good skills in communications and proficiency in a language • Select technologies, policies, and procedures to assure the confidentiality, integrity, and availability of information and IT systems

Teaching Methodology
• Students have weekly meetings with their supervisor. • Supervisors direct the student to prepare the necessary materials for successful completion of the term project. • All project related forms are available on the course web site.