HASAN KALYONCU UNIVERSITY
Faculty of Engineering
Course Description Form

COURSE: Discrete Mathematics				
CODE: MATH114	**SEMESTER :** SPRING			
LANGUAGE: ENGLISH	**TYPE :** COMPULSORY			
PRE-REQUISITES: - **CO-REQUISITES:** -	**THEORY**	**PRACTICAL**	**CREDIT**	**ECTS**
WEEKLY HOURS :	4	0	4	5

CONTENT OF THE COURSE:
Sets, relations and functions, application to data structure and graph representations, partial ordered sets, trees, algebraic structures, lattices and Boolean algebra, semi groups, groups, introduction to grammars and machines and languages, error correcting codes.

OBJECTIVE OF THE COURSE:
On successful completion of this course unit, students/learners will or will be able to:

1. This course has provided the ability to understand elementary facts about sets, functions, relations, graphs, trees, boolean algebra, machines and languages.
2. This course has provided the ability to understand and conduct relation properties, representing relations and partial ordering.
3. This course has provided the ability to find the number of solutions to arrangement problems which are isomorphism and connectivity.
4. This course has provided the ability to apply knowledge on trees and traversal analysis of algorithm.
5. This course has provided the ability to use boolean algebra problems.
6. This course has provided the ability to analyze machine and languages connect algorithmic and algebraic aspects of machine and languages.

WEEKLY SCHEDULE	
Week	**Topics**
1	Introduction
2	Sets
3	Functions, Sequences and Summations
4	Relations (properties, n-ary)
5	Relations (representing relations)
6	Relations (partial orderings)
7	Review and Examples
8	Graphs (terminology)
9	Graphs (isomorphism, connectivity)
10	Trees (introduction)
11	Trees (applications, traversal)
12	Boolean Algebra
13	Machines and Languages
14	Review and Examples

TEXTBOOK: Discrete Mathematics and Its Applications, Kenneth Rosen Seventh Edition, 2012, McGrawHill.

REFERENCE BOOKS: Discrete and Combinatorial Mathematics 5th ed - R. Grimaldi.

EVALUATION SYSTEM:		
IN-TERM STUDIES	**QUANTITY**	**PERCENTAGE (%)**
Midterm Exam	1	30
Homework	0	0
Laboratory works	0	0
Quiz	10	30
Final Exam	1	40
TOTAL	**12**	**100**
CONTRIBUTION OF INTERM STUDIES TO OVERALL GRADE	11	60
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE	1	40
TOTAL	**12**	**100**

COURSE CATEGORY:	**PERCENTAGE (%)**
Mathematics and Basic Sciences	80
Engineering	20
Engineering Design	
Social Sciences	

TABLE OF ECTS / WORKLOAD:			
Activities	**QUANTITY**	**Duration (Hour)**	**Total Workload**
Course Duration	13	4	52
Hours for off-the-classroom study (Pre-study, practice)	14	6	70
Laboratory works	0	0	0
Mid-term	1	2	2
Final examination	1	2	2
Homework	0	0	0
Quiz	10	0.5	5
Total Work Load			**145**
Total Work Load / 30			**4,83**
ECTS Credit of the Course			**5**

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
LO1	3	3	0	0	0	0	0	0	0	0	0
LO2	3	1	0	0	0	0	0	0	0	0	0
LO3	2	2	0	0	0	0	0	0	0	0	0

LO4	3	3	0	0	0	0	0	0	0	0	0
LO5	3	1	0	0	0	0	0	0	0	0	0
LO6	3	3	0	0	0	0	0	0	0	0	0
	PO: Program Outcomes | LO: Learning Outcomes Values: 0: None | 1: Low | 2: Medium | 3: High										

INSTRUCTOR(S):	Asst. Prof. Dr. Ulaş GÜLEÇ
FORM PREPARATION DATE:	23.05.2019

LEARNING OUTCOMES OF THE COURSE:	**PROGRAM OUTCOMES:**
LO1: This course has provided the ability to understand elementary facts about sets, functions, relations, graphs, trees, boolean algebra, machines and languages. **LO2:** This course has provided the ability to understand and conduct relation properties, representing relations and partial ordering. **LO3:** This course has provided the ability to find the number of solutions to arrangement problems which are isomorphism and connectivity. **LO4:** This course has provided the ability to apply knowledge on trees and traversal analysis of algorithm. **LO5:** This course has provided the ability to use boolean algebra problems. **LO6:** This course has provided the ability to analyze machine and languages connect algorithmic and algebraic aspects of machine and languages.	**PO1:** Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied knowledge in these areas in complex engineering problems. **PO2:** Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose. **PO3:** Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose. **PO4:** Ability to devise, select, and use modern techniques and tools needed for analyzing and solving complex problems encountered in engineering practice; ability to employ information technologies effectively. **PO5:** Ability to design and conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems or discipline specific research questions. **PO6:** Ability to work efficiently in intra-disciplinary and multi-disciplinary teams; ability to work individually. **PO7:** Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign language; ability to write effective reports and comprehend written reports, prepare design and production reports, make effective presentations, and give and receive clear and intelligible instructions. **PO8:** Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself. **PO9:** Consciousness to behave according to ethical principles and professional and ethical responsibility; knowledge on standards used in engineering practice. **PO10:** Knowledge about business life practices such as project management, risk management, and change management; awareness in entrepreneurship, innovation; knowledge about sustainable

	development. **PO11:** Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering; awareness of the legal consequences of engineering solutions.