<table>
<tr><th colspan="2">COURSE DESCRIPTION FORM</th></tr>
<tr><td>Course Code and Name</td><td>CENG467 INFORMATION THEORY (TECH.ELECT.)</td></tr>
<tr><td>Course Semester</td><td>7</td></tr>
<tr><td>Catalogue Data of the Course (Course Content)</td><td>Entropy measure degree of uncertainty of physical system state, complex system entropy, theorem of entropies, conditional entropy</td></tr>
<tr><td>Course Textbooks</td><td>Digital Communications: Fundamentals and Applications 2/E, Bernard Sklar, Prentice Hall, 2017.</td></tr>
<tr><td>Supplementary Textbooks</td><td>An Introduction to Information Theory, Symbols, Signals and Noise, Dover, 2012.</td></tr>
<tr><td>Credit (ECTS)</td><td>6</td></tr>
<tr><td>Prerequisites for the Course (Attendance Requirements)</td><td>There is no prerequisite or co-requisite for this course.</td></tr>
<tr><td>Course Type</td><td>Technical Elective</td></tr>
<tr><td>Language of Instruction</td><td>English</td></tr>
<tr><td>Course Objectives</td><td>1. Providing basic knowledge about algorithm models for information-data flow
2. Giving an idea about the effects of theoretical knowledge models on current applications
3. Teaching algorithms to be used in solving information theory problems</td></tr>
<tr><td>Course Learning Outcomes</td><td>1. Understands entropy - the degree of uncertainty of the physical system state.
2. Learns the entropy of the complex system, the addition of entropies theorem and conditional entropy.</td></tr>
<tr><td>Instruction Method
(Face-to-face, Distance education etc.)</td><td>This course will only face-to-face training.</td></tr>
<tr><td>Weekly Schedule of the Course</td><td>Week 1: Degree in Physical System State Entropy Measurement Uncertainty
Week 2: Entropy of a complex system: theorem of entropies
Week 3: Conditional Entropy
Week 4: Dependent on a combination of systems
Week 5: Entropy and Information
Week 6: Partial information
Week 7: Entropy and information systems to continuous change
Week 8: Entropy of Finite Markov Chain
Week 9: Entropy of Finite Markov Chain
Week 10: Problems of Information Encoding
Week 11: Problems of Information Encoding
Week 12: Shennon-Pheno code
Week 13: None Contact
Week 14: Transporting Capabilities Disabled Channels</td></tr>
<tr><td>Teaching Activities
(The time spent for the activities listed here will determine the amount of credit required)</td><td>Weekly theoretical course hours: 3
Reading activities
Internet search and library work
Midterm and revision for midterm
Final exam and revision for final exam</td></tr>
<tr><td>Assessment Criteria</td><td>
<table>
<tr><th></th><th>Number(s)</th><th>Weight (%)</th></tr>
<tr><td>Midterm exam</td><td>1</td><td>40</td></tr>
<tr><td>Assignment</td><td>4</td><td>20</td></tr>
<tr><td>Application</td><td>0</td><td>0</td></tr>
<tr><td>Project</td><td>0</td><td>0</td></tr>
<tr><td>Practice</td><td>0</td><td>0</td></tr>
<tr><td>Quiz</td><td>0</td><td>0</td></tr>
<tr><td>Final exam</td><td>1</td><td>40</td></tr>
<tr><td>Total</td><td>6</td><td>100</td></tr>
</table>
</td></tr>
</table>

Workload of the Course

Activity	Number of Weeks	Duration (Weekly Hour)	End of Semester Total Workload
Weekly theoretical course hours	14	3	42
Weekly practical course hours	0	0	0
Reading activities	14	3	42
Internet search and library work	14	3	42
Designing and implementing materials	0	0	0
Making a report	0	0	0
Preparing and making presentations	0	0	0
Midterm and revision for midterm	1	12	12
Final exam and revision for final exam	1	12	12
Total workload			150
Total workload/ 25			6
Course Credit (ECTS)			6

Contribution Level between Course Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Knowledge of mathematics, science, basic engineering, computing, and computer engineering; ability to use this knowledge in solving complex engineering problems.			x		
2	Ability to define, formulate and analyze complex engineering problems using basic science, mathematics and engineering knowledge and considering the UN Sustainable Development Goals relevant to the problems addressed.		x			
3	Ability to design creative solutions to complex engineering problems; ability to design complex systems, processes, devices, software, algorithms or products to meet current and future requirements, considering realistic constraints and conditions.			x		
4	Ability to select, use and develop appropriate techniques, resources and modern engineering and informatics tools, including estimation and modeling, for the analysis and solution of complex engineering problems while being aware of their limitations.			x		
5	Ability to use research methods to examine complex engineering problems or research topics in computer engineering, including reviewing the literature, designing experiments, conducting experiments, collecting data, analyzing and interpreting results.		x			
6	Knowledge of the effects of engineering practices and the standards used in these practices on society, health and safety, economy, sustainability and environment within the scope of the UN Sustainable Development Goals; awareness of the consequences of engineering solutions in the fields of information security and law.					
7	Acting in accordance with engineering professional principles and knowledge on ethical responsibility; awareness of acting impartially, without discrimination on any issue, and being inclusive of diversity.					
8	Ability to work effectively individually and as a team member or leader in					

		intradisciplinary and multidisciplinary teams (face-to-face, remote, or hybrid).					
	9	Ability to conduct effective verbal and written communication on technical issues in Turkish or English, prepare reports, make effective presentations and prepare software documentation, considering the various differences of the target audience (such as education, language, profession).					
	10	Knowledge of business practices such as project, risk and change management and economic feasibility analysis; awareness of entrepreneurship and innovation.					
	11	Lifelong learning skill that includes the ability to learn independently and continuously, to adapt to new and developing scientific practices and technologies, and to think inquisitively about technological changes.		x			
Lecturer(s) and Contact Information	Lecturer Dr. Bilgehan Arslan bilgehanarslan@gazi.edu.tr						