COURSE INFORMATION					
Course Title	*Code*	*Semester*	*L+P Hour*	*Credits*	*ECTS*
ADVANCED TOPICS IN HIGH PERFORMANCE COMPUTING	CSE 674	1	3 + 0	3	10

Prerequisites	

Language of Instruction	English
Course Level	Graduate
Course Type	Elective
Course Coordinator	
Instructors	Esin Onbaşıoğlu
Assistants	
Goals	The aim of this course is to provide students with knowledge and experience to do research in advanced topics of High Performance Computing.
Content	High performance architectures, concurrency and correctness, partitioning, synchronization, data dependency, performance issues, experience with recent programming standards. Advanced and recent research issues in High Performance Computing.

Course Learning Outcomes	**Program Learning Outcomes**	**Teaching Methods**	**Assessment Methods**
Ability to conduct experiments, gather data, analyze and interpret results for regarding the issues faced in high performance systems and propose solutions.	1,2,3,4,5	1,2	B,D
Ability to understand a published work, to investigate its cons and pros and to present.	1,2,4,8	1,2	A,C
Ability to write a research paper.	3,4,6	1,2	D

Teaching Methods:	1: Lecture, 2: Question-Answer, 3: Lab
Assessment Methods:	A: Testing, B: Experiment, C: Homework, D: Term Project

COURSE CONTENT		
Week	Topics	Study Materials
1	Introduction	
2	Research areas: High performance architectures, concurrency and correctness, partitioning, synchronization, data dependency, performance issues.	
3	Paper discussion – I	
4	Paper discussion – II	
5	Paper discussion – III	
6	Area specialization and focusing on selected areas and topics	
7	Experimental methodology	
8	Midterm Examination	
9	Deep analysis and simulation of the selected studies	
10	Research proposal, analysis and design details	
11	Implementation of the proposed method	
12	Tests and collection of the test results	
13	Paper write-up	
14	Paper presentation	

RECOMMENDED SOURCES	
Textbook	
Additional Resources	Research papers from the recent conferences and journals are studied.

MATERIAL SHARING	
Documents	http://cse.yeditepe.edu.tr/coadsys
Assignments	http://cse.yeditepe.edu.tr/coadsys
Exams	

ASSESSMENT		
IN-TERM STUDIES	**NUMBER**	**PERCENTAGE**
Mid-terms	1	20
Quizzes		
Assignment	3	20
Term Project and Presentation	1	60
Total		**100**
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE		30
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE		70
Total		**100**

COURSE CATEGORY	Expertise/Field Courses

COURSE'S CONTRIBUTION TO PROGRAM							
No	Program Learning Outcomes	Contribution					
		1	2	3	4	5	
1	Ability to understand and use basic sciences, mathematics and engineering sciences in a high level.				X		
2	Possession of wide and deep knowledge in the field of Computer Science and Engineering, including the latest developments.					X	
3	Ability to reach the new information in the field of Computer Science and Engineering and having high-level competence in necessary methods and skills to make the research by apprehending the new information.					X	
4	Ability to bring an innovation that provides different initiatives to the field of Computer Engineering; develop a new approach, method, design, application or apply a present method in a different field.				X		
5	Ability to perceive an original research process independently, and design, implement, conclude and lead the process.				X		
6	Ability to contribute to the literature by publishing the whole scientific research and development efforts he/she has carried out in the field of expertise.			X			
7	Ability to comprehend scientific, technological, social and cultural developments, and convey them to society with scientific impartiality and ethical responsibility.	X					

8	Ability to do critical analysis, synthesis and evaluation of ideas and developments in the field of Computer Engineering.				X
9	Ability to communicate effectively in oral and written ways with the employees in the area of Computer Engineering and wider scientific and social communities, to communicate and discuss in advanced level of written, oral and visual ways by using a foreign language in at least European Language Portfolio C1 General Level.		X		
10	Ability to evaluate scientific, technological, social and cultural developments and to transmit these developments to society with scientific objectivity and a sense of ethic responsibility.		X		

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION			
Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration (Excluding the exam weeks x Total course hours)	13	3	39
Hours for off-the-classroom study (Pre-study, practice)	14	5	70
Midterm examination	1	6	6
Homework	3	15	45
Project	1	80	80
Final examination	1	10	10
Total Work Load			250
Total Work Load / 25 (h)			10
ECTS Credit of the Course			10