INFORMATION ON THE COMPUTER ENGINEERING PHILOSOPHY OF DOCTORATE PROGRAM

General Information	TOBB ETÜ PH.D. program in Computer Engineering Program, founded in 2007. There are currently 13 faculties in the department. The faculty does research mostly in the areas of compuer archıtecture, information security and cryptography, human-computer interaction, image processing, computer vision, data mining, bioinformatics, computational geometry, algorithmic game theory, theoretical computer science, robotics, and software engineering. Graduation from the program requires taking 7 (at least 9 ECTS each), respectively. Students can take some courses from outside of the department. Students are also required to take the BIL 697 Doctoral Seminar (8 ECTS), BIL 699 PhD Thesis course (120 ECTS)and FBE 600 Scientific Research Techniques and Publication Ethics course. There is also More information can be obtained from the Graduate School web site (link: https://www.etu.edu.tr/tr/enstitu/fen-bilimleri-enstitusu)
Program Purpose	The purpose of the Ph.D. Program in Computer Engineering is to educate successful engineers and academicians that are capable of leadership in serving the science and humanity and are strong in adapting to the ever-changing world.
Degree Earned	Ph.D. In Computer Engineering
Level of Degree Earned	Computer Engineering is a First-Cycle (PhD Degree – EQF 8) program.
Requirements and Rules of the Degree Earned	Graduation requirements are defined according to Article 45 of the Undergraduate Education and Examination Regulation (link: http://mevzuat.basbakanlik.gov.tr/Metin.Aspx?MevzuatKod=8.5.15287&MevzuatIliski=0&sourceXmlSearch=). For graduation the thesis student should a) successfully complete at least 90 credits of courses, BIL 697 Graduate seminar, BIL 699 PhD Thesis and FBE 600 Scientific Research Methods and Publication Ethics within the maximum allowable time period b) obtain a GPA of 3.00/4.00. For graduation the student has to publish an SCI indexed journal paper and one conference paper.
Registration Admission Requirements	Student quota of our undergrad programs are determined by the board of regents after a suggestion by the Senate and subject to the approval of the Higher Education Council (YÖK). Acceptance of candidate students is according to the ÖSYM exam scores. Acceptance of foreign students are carried out according to the rules determined by the Senate. Acceptance of horizontal and vertical transfer students and special/guest/exchange students are regulated by the departmental and faculty administrative boards according to Undergraduate Education and Examination Regulation (link: http://mevzuat.basbakanlik.gov.tr/Metin.Aspx?MevzuatKod=8.5.15287&MevzuatIliski=0&sourceXmlSearch=)
Recognition of Prior Learning	A student arriving through the ÖSYM examination or by undergraduate transfer can substitute courses taken in a quitted previous higher education program. The substitution of the courses taken in a previous program, its equivalency and suitability with the courses in the program are evaluated at the Departmental and Engineering Faculty Boards. In case of approval of subtitution, the course is substituted with its letter grade. In case of vertical transfer the course is substituted with M (Exempt) grade. Grade is converted to a letter at graduation.
Examinations, Assessment and Grading	Evaluation and assessment methods used for each course are defined according to Article 22 of the Undergraduate Education and Examination Regulation (link: http://mevzuat.basbakanlik.gov.tr/Metin.Aspx?MevzuatKod=8.5.15287&MevzuatIliski=0&sourceXmlSearch=). Except the project and laboratory courses, which do not necessarily require an examination, all courses require at least a midterm and a final exam. Final exams are applied in a specific period of time indicated in the Academic Calendar. Final exam period and classrooms are determined by the Rectorate.
Teaching Style	The style of education is Full-Time and Day-Time. All of the courses are given in classrooms.

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Occupational Profiles of Graduated-Employment Opportunities	As of the end of 2017 our PhD program gave 7 graduates. Three of them are continuing their academic career as Assistant Professor in national universities and one of the is a post doc abroad. Other graduates are research engineers in defense in national industry.
Transition to a Upper Degree	

NQF-HETR PROGRAM QUALIFICATION MATRIX				PROGRAM QUALIFICATIONS										
Program : Computer Engineering														
Related NQF-HETR Core Field: Engineering (Academic) - Master Degree				1	2	3	4	5	6	7	8	9	10	
CORE AREA QUALIFICATIONS	INFORMATION	Theoretical - Factual	Achieves knowledge expansion and depth by doing scientific research in math , algorithms, and software design and development.	X	X		X	X				X		
	SKILLS	Cognitive - Applied	Completes and applies the theoretical and practical knowledge on math, algorihms, software design and development together with engineering solutions	X	X	X	X	X				X		
			Builds computer engineering problems, develops methods to solve them, and applies innovative methods in solutions.	X	X			X				X		
			Develops new and / or unique ideas and methods; develops innovative solutions in system, component or process design.	X	X	X	X					X		
			Designs and implements analytical, modeling and experimental based research; analyzes and interprets complex situations encountered in this process.		X		X		X			X		
			Collects data, designs suitable test cases, performs debugging, analyses and interprets resuls		X	X		X						
	COMPETENCIES	Ability to work independently and to take responsibility	Works effectively as an individual or as a part of interdisciplinary team						X					
			Accesses knowledge and performs literature search using		X		X	X			X		X	
		Learning Competence	Accesses knowledge and performs literature search using databases and other information sources		X		X	X			X		X	
			Aware of life-time learning, closely follows the developments in science and technology										X	
			Adapt himself to the developments in algorithms, software design and development	X	X	X	X	X				X		
			Identifies/formalizes/solves computer engineering problems, selects and applies appropriate analytical and modelling techniques	X	X		X	X				X		
			Desins a system under realistic constrains and uses modern design techniques for this purpose	X	X	X	X	X				X		
			Selects and uses modern techniques and tools for engineering applications	X	X	X	X	X				X		
			Works effectively as an individual or as a part of interdisciplinary team	X					X					
		Communication and Social Competence	Uses information and communication technologies effectively			X			X					
			Communicates verbally and in writing using a foreign language at least at the European Language Portfolio B1 General Level.							X	X			
			Communicates using modelling languages							X	X			
			Accesses knowledge and performs literature search using databases and other information sources		X		X	X			X		X	
			Aware of environmental and social impacts of engineering solutions and applications; aware of entreprenership, innovation and problems of the age	X	X	X	X					X		
		Field Specific Competence	Cbserves social, scientific and ethical values in the process of collecting, interpreting and announcing data and in all professional activities.							X				
			Awareness on project management, workplace practices, employee health, environmental and occupational safety; have an understanding of the legal consequences of their engineering applications.			X				X				
			Leads in multidisciplinary teams, develops solution approaches in complex situations and take responsibility.	X		X							X	
			Demonstrates the awareness of the universal and social implications of engineering solutions and practices; awareness of the issues of entrepreneurship and innovation and has knowledge of the problems of the times.											

Program Yeterlilikleri

1	Analytical thinking skills
2	Ability to find algorithmic and effective solutions to real life problems
3	Ability to adapt to new technologies
4	Software or process design skills to meet the requirements
5	Ability to apply math, science and engineering knowledge
6	Interdisciplinary ability to work
7	Observing social, scientific and ethical values in all professional and scientific activities
8	The necessity of life-long learning is knowing and practicing ability
9	Ability to develop and use the techniques, abilities and modern tools necessary for engineering applications
10	To develop new and original ideas and methods; develop innovative solutions in system and software design

BİL 501	Distributed Data Processing and Analysis	3	5	5	4	4	3	3	4	3	4	4	
BİL 504	Algorithmic Game Theory	5	2	2	2	5	5	3	3	2	2	3	
BİL 510	Information Theory	5	2	2	2	5	5	3	3	2	2	3	
BİL 512	Programming Language Theory	5	3	4	5	5	3	2	3	2	4	3	
BİL 514	Theory of Computation	5	2	2	2	5	3	3	3	2	2	4	
BİL 520	Introduction to Cyber Security	4	5	5	5	5	3	5	3	4	4	4	
BİL 525	Network Forensic Analysis	4	5	5	5	5	3	5	3	4	4	5	
BİL 527	Network Defense Systems	4	5	5	5	5	3	5	3	4	4	5	
BİL 531	Algorithm Analysis	5	5	2	4	5	5	3	3	2	2	4	
BİL 533	Parallel Computation	5	5	5	4	4	3	3	4	3	4	4	
BİL 535	Computational Geometry	5	5	2	4	5	5	3	3	2	2	3	
BİL 536	Approximation Algorithms	5	5	2	4	5	5	3	3	2	2	3	
BİL 537	Randomized Algorithms	5	5	2	4	5	5	3	3	2	2	3	
BİL 541	Artificial Intelligence	5	5	5	4	4	4	3	5	5	4	5	
BİL 542	Artificial neural networks	5	5	5	4	4	4	3	5	4	5	3	
BİL 543	Expert Systems	3	5	5	4	4	4	3	5	4	5	3	
BİL 546	Semantic Web	4	5	5	4	4	3	3	4	3	4	4	
BİL 548	Internet Security Protocols	4	5	5	5	5	3	5	3	3	5	4	
BİL 549	Feature Extraction	5	5	5	4	4	4	3	5	4	5	5	
BİL 551	Data Communications and Computer Networks	5	5	5	4	4	3	3	4	3	4	3	
BİL 553	Internet and Data Security	4	5	5	5	5	3	5	3	5	3	4	
BİL 557	Wireless Networks	5	5	5	4	4	3	3	4	3	4	3	
BİL 561	Image Processing and Recognition	5	5	5	4	4	4	3	5	5	4	5	
BİL 563	Digital Signal Processing	5	5	5	4	4	4	3	5	4	5	3	
BİL 564	Pattern Recognition	5	5	5	4	4	4	3	5	5	4	5	
BİL 565	Computer Architecture	4	3	2	3	3	2	3	3	5	3	4	
BİL 569	Embedded Systems	4	3	2	3	3	2	3	3	5	3	3	
BİL 570	Artificial Learning	5	5	5	4	4	4	3	5	5	4	5	
BİL 573	Data Mining	5	5	5	4	4	4	5	5	5	4	5	
BİL 574	Artificial Intelligence Applications in Finance	4	5	5	4	4	4	3	5	5	4	5	
BİL 582	Software Engineering	5	5	5	5	4	3	5	4	5	4	2	
BİL 587	Computer Vision	5	5	5	4	4	4	3	5	5	4	5	
BİL 589	Graph Theory	5	5	2	4	5	5	3	3	2	2	2	
BİL 595	Bioinformatics	4	5	4	4	4	4	5	4	5	4	5	
BİL 697	Seminar	0	0	0	2	2	0	0	5	0	3	2	
BİL 699	PhD Thesis	5	5	5	5	5	5	5	5	5	5	5	
FBE 600	Scientific Research Techniques and Publishing Ethics	0	0	0	0	0	0	5	0	0	0	0	