

23. TR: Turkey

Coordinating Author: Bahar KARAOĞLAN (Ege University, bahar.karaoglan@ege.edu.tr)

Review: Dervis DENIZ (Eastern Mediterranean University)

23.1. General Information

General Structure of Turkish Educational System



The educational system in Turkey is structured under pre-school, primary, secondary and higher education levels as seen in Fig. 30.1.

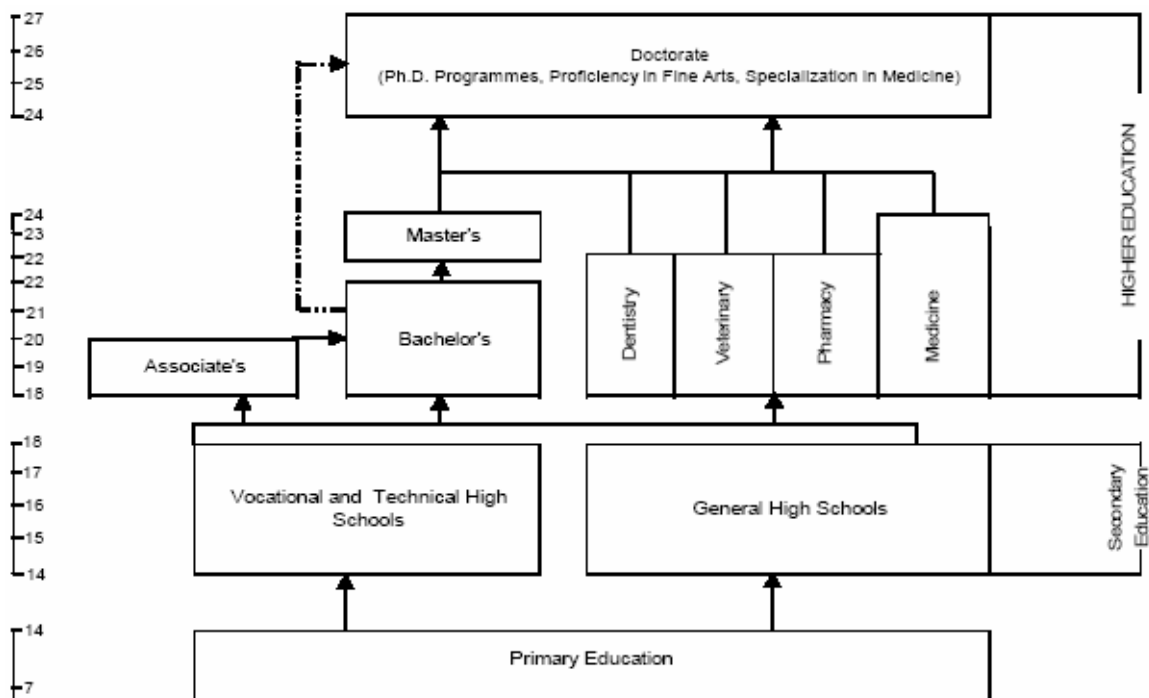


Figure 22.1: Structure of Turkish Educational System (Age shown on the left)

Admission to higher education is based on a nation-wide Student Selection Examination. The examination is held once a year by the Student Selection and Placement Centre. Candidates are admitted to the institutions of higher education based on their composite scores calculated based on their scores on the selection examination and their high school grade point averages.

To increase the capacity of higher education open education is started in Anadolu University in 1982 reaching a 845,411 students in 2006-2007. Another solution is the adoption of “2nd Education – Evening Education” based on saving on investments.

There are total of 93 higher educational institutions in Turkey. 68 of these educational institutions are public universities, 25 are private universities. Schooling rates in higher education in Turkey in 2005 are 25% in formal education and 39% together with open education. The total number of students in higher education in the year 2006-2007 is 2,453,664.

Organization of a course of study

- The academic year is divided into two semesters as fall and spring.
- The academic year begins in September and ends in the beginning of June. In general it takes around 36 weeks of lecture, laboratory work, seminars and two examination periods.
- The capacity of studies is measured in credits. 3 credits (7.5 ECTS) corresponds to 45 hours (3 hours per week) of lecture. The nominal academic year consists of 24 credits (60 ECTS).

23.1.1 *Electrical and Information Engineering in Turkey: Boundaries of the Field of Study*

Specialties related to Electrical and Electronics Engineering, Computer Sciences and Engineering are very favorable in Turkey. For this reason most of the universities have Electrical and Electronics Engineering and Computer Engineering departments under the Engineering (Engineering and Architecture) Faculties. By the year 2007, 63 universities host Electrical and Electronics Engineering department and 56 host Computer Sciences / engineering Departments. The specialties under Information Technologies are Management Informatics, Information Technologies, Computer Systems, Software Engineering, Hardware Systems, Control and Command Systems. In some universities Computer Sciences Departments appears under Electrical and Electronics Engineering Departments.

Specialties related to Electrical and Electronics engineering are: Electromagnetic Fields and Microwave Techniques, Circuits and Systems, Electronics, Telecommunication, Electrical Machines, Computer Sciences, Control and Command, Electric Power Systems, Electromagnetic fields and microwave.

23.1.2 Content, degree and accreditations

The Higher Education Council (YÖK) established in 1981 is responsible for the planning, coordination and supervision of higher education in Turkey. The Minister of National Education represents higher education in the Parliament and can chair the meetings of the Higher Education Council but has no right of vote. Neither the decisions of the Council nor those of the universities are subject to ratification by the Ministry.

Since quality assurance in universities has gained importance both at international level in general and in frame of Bologna Process for the last ten years, the attention of Turkish universities to quality assurance has significantly increased. Since the first years of 1990s, engineering programs of long-established universities have passed ABET (Accreditation Board for Engineering and Technology, USA) evaluation process and received equivalency accreditation issued by ABET for countries other than the USA and obtained a quality assurance that is internationally valid. Based upon this experience, Engineering Accreditation Board was established in scope of Engineering Deans' Council in 2002. This unit has been evaluating engineering programs even though it does not have a legal entity status yet. In 1997, the Council of Higher Education and British Council started the "Project on Determining the Quality of Turkish Universities", completed its pilot studies and prepared a report on the process but could not implement the project. Starting from 1998-99 academic year, accreditation was envisaged for the academic staff in faculties of education, which were restructured and in this context regulations have been realized in order to increase quality.

In the last years, 7 universities passed institutional evaluation process of the European Universities Association (EUA). They participated in quality culture project of EUA since 2002. This project targets to develop and share quality culture among Bologna countries.

In accordance with the "Regulations on Academic Assessment and Quality Improvement at Higher Education Institutions" that was prepared by the Council of Higher Education and took force on September 20, 2005, the **Commission on Academic Assessment and Quality Improvement in Higher Education (YÖDEK)** composed of 9 members selected by Interuniversity Board started its works. "Guide on Academic Assessment and Quality Improvement at Higher Education Institutions" completed by this Commission in May 2006, was prepared by considering the developments in the world and Europe dimension, especially in Bologna Process and in this context it determines duties and responsibilities of the upper bodies of higher education and higher education institutions, internal and external assessment principles and criteria as well as details regarding the process.

The Council of Higher Education started works on national qualifications framework for higher education in the scope of Bologna Process and Lisbon strategy. In this context, studies regarding the descriptors of sectoral qualifications on the programme basis, and as well as the level descriptors of the qualifications and ensuring quality assurance of learning outcomes will be realized in stages until the end of 2007.

23.1.3 Implementation of the Bologna-BMD System in Turkey

Integration of Turkey with European Higher Education Area started with its official participation to Bologna Process in 2001. In scope of 10 action lines of Bologna Process the following activities have been realized until now:

1. Works related to Diploma Supplement and European Credit Transfer System: Diploma Supplement and European Credit Transfer System became mandatory for all higher education institutions since the end of 2005-2006 academic year.
2. The establishment of national student's union:
"Regulations for student councils of higher education institutions and the national student council of higher education institutions" took effect after published in the Official Gazette of September 20, 2005 and No. 25942.
3. The establishment of quality assessment and improvement systems that are fully compatible with the principles and procedures determined at European level. "Regulations on Academic Assessment and Quality Improvement at higher education institutions" prepared by the Council of Higher Education was published in the Official Gazette of September 20, 2005 and no. 25942 and took effect.
4. The work on Bologna Process action line related to national qualifications framework for higher education: higher education competencies, engineering competencies and other sectors
5. Lisbon Convention on "the Recognition of Qualifications concerning Higher Education in the European Region (1997)" signed by Turkey on December 1, 2004 was approved with the Law No. 5463 of February 23, 2006 and came into force after published in the Official Gazette No. 26094 of December 28, 2006.

Performance of Turkey has been assessed as "excellent" for two- cycle degree system; "very good" for recognition of degrees and study periods; and "some progress" for quality assurance in the Report from a Working Group Appointed by the Bologna Follow-up Group (Bologna Process Stocktaking; Bergen, May 2005, page 104)

23.2. Figures on the weight of EIE in Turkey

To give some idea about the weight of EIE in the higher education of Turkey some tables and charts are given. In Table 1 figures for the last 7 academic years are listed. The first row gives the number of educational staff that includes the professors, associate professors, assistant professors, instructors, language instructors, specialists and research assistants. In the second row total number of students in formal and second higher education (excluding the two year vocational higher education and open education) is given. The third and fourth rows give the total number of master's and doctoral students. In the fifth and sixth rows number of students in Electrical and Electronic Engineering and Computer Engineering are listed.

Table 22.1. Some Statistics about the Number of Students and Staff for the Last 7 years.

	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Total number of staff	67,880	71,290	76,090	78,804	82,096	84,785	89,329
Total number of undergrad students	745,377	775,139	793,906	823,740	862,948	915,043	937,317
Total number of students in master's	65,068	73,466	82,277	90,057	92,566	111,814	108,683
Total number of students in doctorate	21,739	22,514	23,176	24,835	27,335	32,503	33,711
Number of students in EE	16,689	17,304	18,027	18,820	19,558	20,312	20,953
Number of Students in CS	8,577	9,994	10,987	12,589	14,073	15,118	16,180

Table 22.2 compares the number of graduate students in EIE to the total number of graduate students in technical sciences that include the disciplines: Engineering Sciences, Environmental Studies, Aeronautics and Space Sciences, Geology, Geophysics, Mining, Petroleum Studies, Metallurgy, Mechanical Engineering, Marine Sciences and Naval Architecture, Nuclear Sciences, Electric-Electronics, Defense Technology, Computer Sciences, Civil Engineering, Architecture, Industrial Engineering, Food, Chemical Engineering, Agriculture and Forestry.

Table 23.2 Comparison of Number of Graduate Students in EIE Field to the Total Number of Graduate Students in Technical Sciences for the Last 7 Years.

	Technical Sciences		EE		Informatics	
	Master	doctorate	Master	Doctorate	Master	Doctorate
2000 – 2001	16,967	4,704	2,235	617	1,330	221
2001 - 2002	17,880	4,817	2,194	647	1,492	237
2002 - 2003	18,473	5,055	2,237	706	1,767	309
2003 – 2004	19,322	5,790	2,358	844	1,955	353
2004 – 2005	19,305	6,450	2,401	953	2,119	457
2005 – 2006	21,258	7,601	2,723	1,138	2,537	571
2006 - 2007	20,655	8,028	2,646	1,186	2,558	584

Distribution of the students in EIE specialties

The distribution of undergraduate students in EIE specialties for the academic year 2006-2007 is shown in figure 2. Here, only the students who are in the formal education engineering discipline are considered.

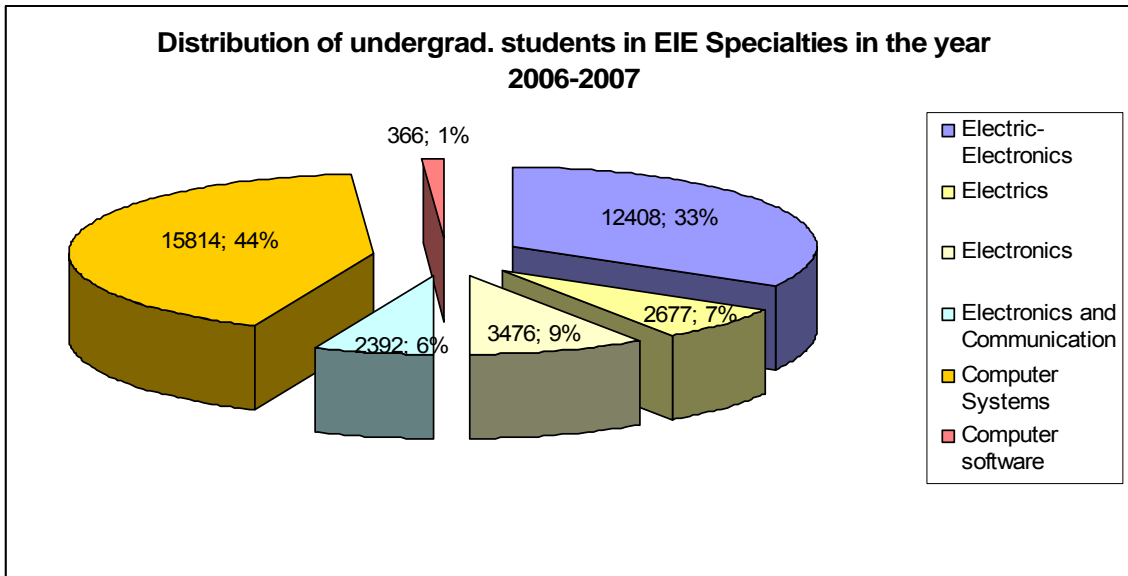


Figure 23.2. The distribution of undergraduate students in EIE specialties in the academic year 2006 – 2007.

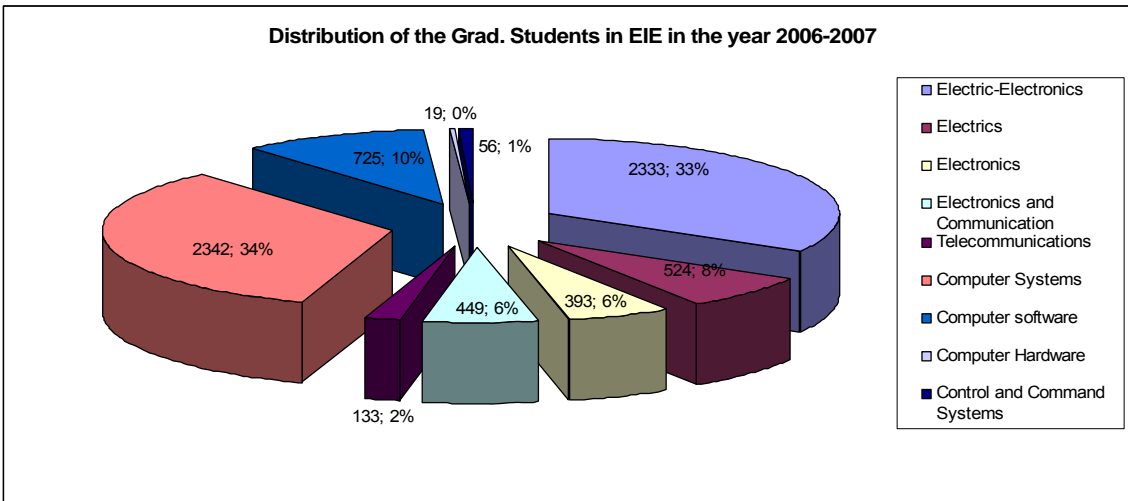


Figure 23.3. The distribution of graduate (master's and doctoral) students in EIE specialties for the academic year 2006-2007

23.3. Degrees in EIE in Turkey

Undergraduate level of study consists of two levels; Associate's Degree and the Bachelor's Degree. Associate's Degree is awarded after the successful completion of a full-time two-year study. Bachelor's degree is awarded after the successful completion of full-time four-year university study. The durations of Dentistry, Pharmacy and Veterinary Medicine programmes are five years, and that of Medicine is six years. The qualifications in Dentistry, Medicine and Veterinary Medicine are equivalent to the Bachelors plus Masters Degree. The establishment of any new degree programme at any level is subject to approval by YÖK. Graduate level of study consists of the Master's Degree and the Doctorate Degree. There are two types of Master's programmes: with and without a thesis. The duration of the master's programmes with theses is two years, whereas the duration of the programmes without theses is one and half years. Doctorate programmes have a duration of four years which consists of completion of courses, passing a qualifying examination, and preparing and defending a dissertation. A recent change on the Regulations on Graduate Education permits the Bachelor's degree holders to be admitted directly to Doctorate programmes. Graduate level programmes are coordinated by graduate schools.

23.3.1 Degrees in EIE in Bachelor Level

Bachelor in Electrical and Electronics Engineering
Bachelor in Electrical Engineering
Bachelor in Electronics Engineering
Bachelor in Electronics and Communication
Bachelor in Computer Engineering
Bachelor in Computer Sciences
Bachelor in Computer Software

23.3.2 Degrees in EIE in Graduate Level

Master's (Ph. D.) in Electric-Electronics
Master's (Ph. D.) in Electrics
Master's (Ph. D.) in Electronics
Master's (Ph. D.) in Electronics and Communication
Master's (Ph. D.) in Telecommunications
Master's (Ph. D.) in Computer Sciences
Master's (Ph. D.) in Computer systems
Master's (Ph. D.) in Control and Computer
Master's (Ph. D.) in Theoretical Foundations of Computer Engineering
Master's (Ph. D.) in Computer Software
Master's (Ph. D.) in Information Systems
Master's (Ph. D.) in Informatics
Master's (Ph. D.) in Computer Networks and Internet Technologies
Master's (Ph. D.) Control and Command Systems
Master's (Ph. D.) in Cognitive Sciences

23.4. References

- Online Statistical reports of Student Selection and Placement Centre of Turkey
<http://www.osym.gov.tr/BelgeGoster.aspx?F6E10F8892433CFFAAF6AA849816B2EF8F59EC4393613791>

- Higher Education Strategy for Turkey (Draft Report), Republic of Turkey The Council of Higher Education, June 2006, Ankara. Available online at
http://www.yok.gov.tr/duyuru/2006/turkey_higher.pdf



23.5. Doctoral Studies in Turkey

23.5.1. Supervision

Scientific Board or Supervisor

The Scientific board is composed by at least three members where one must be from another university. The student, in most cases, has the same personal supervisor during its thesis work not necessarily on an active research area of the supervisor. There may be co-supervisor.

Subject Assignment

Subject assigned after a period of coursework, by agreement between the student and the supervisor. In most cases the student and the supervisor decide roughly on the subject before the student is admitted to the program. After the coursework they finalize the problem and the student proposes the problem to the steering committee.

Who can be a Supervisor

Any professor or lecturer in the department can be a supervisor. There may be a co-advisor from another university but (s)he is required to have PhD degree.

Tasks of Scientific Board/Supervisor

- | | | |
|----|------------------------------------|-----|
| 1. | General management | YES |
| 2. | Deciding/advising layout of course | YES |
| 3. | Assigning a thesis subject | YES |

In the end, advise the faculty if the student may present the thesis.

Duration: three to four years.

23.5.2. Development

Courseware?

Yes.

Course Work

1. The students have to take course work during their doctoral degree preparation and is offered as specialist graduate course units. The course work in some cases can be assessed by examinations. Writing a paper or projects can be tools for evaluation. If the student fails in the course work, he/she must, take a different course unit. The student has to complete 21 credits in at most two years.
2. Extension: 252 hours or more, in the first year.
3. Credit system: 21 credits are allocated to course work. Three credits correspond to 7.5 ECTS.
4. Monitoring of the doctoral student when the course work is assessed by examinations.

Contribution to Teaching

Supervision of undergraduate: teaching is not allowed before getting Ph.D. degree. Tutoring, grading and lab assistance can be done by the doctorate students.

Presentation of Work

1. In the department.
2. At national conferences.
3. At international conferences.

23.5.3. Thesis Work

Submission of Doctoral Written Thesis

1. Language: Turkish. Alternative languages: English and French.
2. No credits allocated to the doctoral thesis.
3. The doctoral thesis is a previously unpublished substantial written report.

Oral Presentation of Thesis Work

1. Language Turkish. Alternative languages: English and French..
2. Oral presentation with oral examination for an open audience behind close doors or not depending on the examination committee.
3. Duration: typical duration from 1 hour to 2 hours for the oral part of the examination. The commission will give the student an indication for the duration of his contribution and the president of the commission will lead the exam in general.

23.5. 4. Examination

Thesis Examination Board

1. Composition: the Dissertation committee consists of at least 5 members where 3 are internal and 2 are from other universities.
2. Selection by the scientific committee of the institution.

Evaluation

1. Result based on the reading of the thesis and the oral presentation of the thesis work, with no grading system. But in special circumstances there can be "felicitations of the jury" in extra (seldom).
2. If the student fails, he/she may resubmit a revised thesis within three months.

23.6. Questionnaires

Turkey

3 – ACTIVITIES DURING DOCTORAL STUDIES

3.1- SUPERVISION OF DOCTORAL STUDIES

- 3.1.1** Are the doctoral studies supervised by a Scientific Board/supervisor? If no, please proceed to 3.1.5. YES/NO
- 3.1.2** **How many members are in the Scientific Board?** 3- 5
- Steering committee consists of at least 3 members where one must be from another university. Dissertation committee consists of at least 5 members where 3 are internal and 2 are from other universities.**
- 3.1.3** How are the members of the Scientific Board chosen?
- 3.1.3.1** Elected by the Faculty, Department? YES/NO
- 3.1.3.2** Chosen by the student? YES/NO
- 3.1.3.3** Chosen in another way? Please specify: YES/NO
- 3.1.4** Which are the main tasks of the Scientific Board/ Supervisor?
- 3.1.4.1** General management of the doctoral studies. YES/NO
- 3.1.4.2** Deciding the layout of the course, advising the students on their coursework. YES/NO
- 3.1.4.4** Assigning the thesis subject. YES/NO
- 3.1.4.5** Other. Please specify: YES/NO
- In the end, advise the faculty if the student may present the thesis.
- 3.1.5** Does the student need a personal supervisor during her/his studies? YES/NO
- 3.1.5.1** Does the same person supervise her/his thesis work? YES/NO
- There may be co-supervisor.**
- 3.1.6** Must the subject of the doctoral thesis be an active research area in the department? YES/NO¹

¹ But this is the case for more than 99%.

3.1- SUPERVISION OF DOCTORAL STUDIES

3.1.7 The doctoral thesis subject is normally assigned:

3.1.7.1 At the beginning of the doctoral studies? YES/NO

3.1.7.2 After a specified period of coursework? YES/NO

3.1.7.3 Other. Please specify:

In most cases the student and the supervisor decide roughly on the subject before the student is admitted to the program. After the coursework they finalize the problem and the student proposes the problem to the steering committee.

3.1.8 The thesis supervisor of a doctoral student can be:

3.1.8.1 Any professor or lecturer in the department? YES/NO²

3.1.8.2 Any researcher in the department? YES/NO

3.1.8.2.1 In this case, is there a need for a second supervisor who is a professor or lecturer in the department? YES/NO

3.1.8.3 Any researcher in another institution? YES/NO

3.1.8.3.1 In the latter case, is there a need for an internal supervisor? YES/NO³

3.1.8.4 Other methods. Please specify:

² **Minimum PhD level is required.**

³ **There may be a co-advisor from another university but (s)he is required to have Ph.D degree.**

3.1.9 The thesis subject is assigned by:

3.1.9.1 Agreement between the student and the proposed supervisor? YES/NO

3.1.9.2 Other methods. Please specify: YES/NO

3.2- COURSE WORK

3.2.1 Do the students have to take coursework during their doctoral degree preparation? If no, please proceed to 3.3. YES/NO

3.2.2 Extension and assessment.

3.2.2.1 What is the number of contact hours spent in coursework in each year?

	Year 1	Year 2	Year 3	Year 4
	252	hrs	hrs	hrs

The student is required to take at least 7 courses each 3 hours a week. Taking each semester as 12 weeks this makes $7 \times 12 \times 3 = 252$ hours.

3.2.2.2 In which form is this coursework offered?

- As specialist graduate course units. YES/NO

- As course units taken from the undergraduate programme. YES/NO

- Other. Please specify.

At least 5 of the courses must be at the doctorate level (code 600) and 2 may be from graduate level (code 500).

3.2.2.3 Is the coursework assessed by examinations? If not, please give details: YES/NO

Examination is not required for the final evaluation. It totally depends on the professor. Writing a paper, projects can be tools for evaluation.

3.2.3 Credit system

3.2.3.1 Is the coursework in your institution described by a credit system? YES/NO

3.2.3.2 Is it the ECTS system? YES/NO

If not, what is the relationship with ECTS?

3 credits corresponds to 7.5 ECTS

3.2.3.3 How many credits are allocated to coursework? **21 credits**

See above.

3.2- COURSE WORK

3.2.4 Monitoring

3.2.4.1 Do you monitor the performance of the doctoral student taking coursework? YES/NO

3.2.4.2 What regulations apply in case of failure in one or more course units?

- Retake the exam. YES/NO

- Take a different course unit. YES/NO

The student has to complete 21 credits in at most two years. If not he is stopped.

3.3- PRESENTATION OF WORK RESULTS:

3.3.1 In the department. YES/NO

3.3.2 At national conferences. YES/NO

3.3.3 At international conferences. YES/NO

Minimum requirements: one publication at international level, two seminars about the PhD work.

3.4- CONTRIBUTION TO TEACHING:

3.4.1 Supervision of undergraduate laboratory. YES/NO

3.4.2 Teaching undergraduate courses. YES/NO

Teaching is not allowed before getting Ph.D. degree. Tutoring, grading and lab assistance can be done by the doctorate students.

4 - AWARDING OF DOCTORAL DEGREE

4.1- SUBMISSION OF DOCTORAL THESIS

- 4.1.1 Which language is normally used for the thesis? Turkish
- 4.1.2 Are alternative languages used for the thesis?
Please Specify: YES/No
It depends on the language of education. There are universities which are teaching in English and French.
- 4.1.3 Which language is normally used for the oral presentation and/or examination? Turkish
- 4.1.4 Are alternative languages used in the oral presentation and examination?
Please Specify: YES/NO
All written and oral presentations are done in the language of education. So it can be in Turkish, English or French.
- 4.1.5 Are credits allocated to the doctoral thesis? YES/NO
- 4.1.6 **The doctoral thesis is:**
- 4.1.6.1 A previously unpublished substantial written report. YES/NO
- 4.1.6.2 A collection of individual or co-authored scientific papers with an introduction and/or commentary. YES/NO
- 4.1.6.3 Other. Please specify:

4.2- THESIS EXAMINATION AND DEGREE AWARDING

- 4.2.1 Is there an oral presentation of the thesis work or an open audience as part of the evaluation procedure? YES/NO
- 4.2.2 Composition of the thesis examination board. Please, give the typical number of:
- 4.2.2.1 Internal examiners. At least 3
- 4.2.2.2 External examiners. **At least 2**
- 4.2.2.3 TOTAL 5

4.2- THESIS EXAMINATION AND DEGREE AWARDING

4.2.3 How is the examination board chosen?

4.2.3.1 By the supervisor.

4.2.3.2 By the scientific committee of the institution.

YES/NO

4.2.3.3 By the rector or equivalent.

4.2.3.4 By the national ministry.

4.2.3.5 Other. Please specify:

4.2.4 Do the examiners base their evaluation mark on:

4.2.4.1 Reading the thesis.

YES/NO

4.2.4.2 The oral presentation of the thesis work.

YES/NO

4.2.4.3 Both.

YES/NO

Thesis is evaluated based on its originality and novelty.
Examiners also base their evaluation on: answers given to the examination board, answers given to the general audience, an oral examination of the candidate, including detailed questions on the thesis.

4.2.4.4 What is the typical duration of the oral part of the thesis examination, if applicable?

1 to 2 hours

4.2.4.5 Is there an upper limit to the duration of the thesis examination?

YES/NO

The commission will give the student an indication for the duration of his contribution and the president of the commission will lead the exam in general.

4.2.5 Is the oral part of the examination taken behind closed doors?

Depends on the examining committee.

4.2.6 What happens if the student fails?

4.2.6.1 May not resubmit for doctorate.

YES/NO

4.2.6.2 May resubmit revised thesis.

YES/NO

4.2.6.3 May do further work as specified by examination board.

YES/NO

There may be three outcomes. Accept, reject or accept with revision and/or further work.

4.2- THESIS EXAMINATION AND DEGREE AWARDING

4.2.6 What happens if the student fails?

4.2.6.4 If the thesis is to be re-submitted is there a time limit for this to occur?
Please specify: YES/NO

The student is given at most 3 months to do the revisions.

4.2.7 Is there a grading system for the doctoral degree based on the quality of the work? YES/NO

Basically it is Yes Or NO. But in special circumstances there may be” felicitations of the jury” in extra (seldom).