DEMOCRITUS UNIVERSITY OF THRACE

SCHOOL OF ENGINEERING

CIVIL ENGINEERING DEPARTMENT

ACADEMIC GUIDE

POSTGRADUATE PROGRAM

HYDRAULIC ENGINEERING AND ENVIRONMENT

2025 - 2026

XANTHI

DEMOCRITUS UNIVERSITY OF THRACE

MASTER'S DEGREE PROGRAM ACADEMIC GUIDE

HYDRAULIC ENGINEERING AND ENVIRONMENT

ACADEMIC YEAR 2025 - 2026

EDITOR:
Angelidis Panagiotis, Professor

Contents

THE THRACE

Greek Thrace is a small part of the geographical area known in history as the "Greater Thrace". Incorporated into Greece in 1920, it is located on the northeastern mainland and adjoins eastward with Turkey and northward with Bulgaria, with which it is connected by road and rail.

The Greek Thrace constitutes, along with the An. Macedonia, special administrative region of the Greek state with the capital of Komotini. It consists of three prefectures (Xanthi, Rodopi and Evros) with the capitals of Xanthi, Komotini and Alexandroupolis, respectively. The prefecture of Evros also belongs to Samothrace, one of the most beautiful islands of the Aegean Sea.

In addition to agriculture and livestock farming, which were the traditional branches of the economy in the region, the development of the industry has been seen in the last few years.

The Commission's proposals are in line. Thrace, due to its key geographical location, has developed into a "gateway" of Europe to Turkey and the East, as well as an important transportation hub to and from the central Balkan region. These developments, combined with the development of the University in four cities of Thrace (Xanthi, Komotini, Alexandroupolis, Orestiada), result in the gradual development of the area and the rise of the living and spiritual level of its inhabitants.

In Greek Thrace are important archeological sites such as Abdera (home of Democritus from which the name of the University was derived), Maroneia, Mesembria, Samothrace etc. Also in Thrace belong to extremely important wetlands, such as the delta rivers Nestos and Evros and the lagoon of Vistonida, and one of the most important national parks in Greece where some of the most rare species of birds of prey in Europe, the forest of Dadia, live.

XANTHI

Built amphitheatrically at the foot of the Rhodope mountain range, Xanthi is located in Thrace (Northern Greece), the crossroads of the Black Sea and the Aegean, Europe and Asia.The Kosythos River divides the city into the western part, where the old and modern part of the city are located, and on the eastern side, the
"Samakov district" which can be proud of a rich natural environment. Both parties still maintain their traditional atmosphere, charming the visitors with their courtesy and their greatness. The narrow cobbled streets of the old town are decorated with gorgeous mansions, whose architecture is a wonderful blend of local and Ottoman architecture, and of Greek neoclassical architecture. Along with the Byzantine churches and picturesque squares, the old town of Xanthi could be said to be an open museum, the glory of which remains intact over time. The modern part of the city is located in a beautiful square with the central clock and the renovated tobacco warehouses, such as the famous "P", on Kapergon Street, which was named after the shape of the buildings of 1890.
her, which happens every Saturday.

Take a deeper taste of the rich history of the region through your visit to the Museum of Folk Art, Museum of Natural History, Municipal Art Gallery and Abdera archeological site. Numerous cultural events organized throughout the year offer one more important reason to visit Xanthi. Festivals Old

In September, where all events take place in the narrow cobblestone streets of the old town of Xanthi, the Youth Festival and the Music Festival of the Nestos River in summer, are especially popular among young people.

Text by Greek National Tourism Organization
www.visitgreece.gr

XANTHI COASTLINE

All over the southern part of N. Xanthi stretches beautiful beaches, open to the Thracian Sea, which are delimited west by the Nestos Delta and east by the lagoons of the complex of Vistonida: Beaches and spaces well organized and equipped are those of Erasmio, Mangana, Myrdatos, Abdera and Mandra, access from the city is fast and the road network is sufficient. These beaches stand out for their cleanliness, the shallow waters, vast beaches and picturesque coves that attract holidaymakers but also artisanal fishermen. These areas offer a sublime beauty in the winter months as well as many opportunities for bird watching.

OLD CITY CELEBRATIONS

The second festive institution in Xanthi is the Old Town celebrations, which have been uninterrupted since 1991, take place with the advent of Autumn. Most of these events take place in the traditional preserved settlement of Xanthi, the so-called "Old Town", in the alleys of which the hangars of the cultural and carnival clubs are erected to offer food and drink. The club's haunts are reveled, while festivals similar to those of Carnival are held in the same place.

CARNIVAL OF XANTHI

The longest-lived institution is that of the Blonde Carnival - Thracian Folklore Holidays started in 1966. Born in an era of urbanization and industrialization - a time critical to economic issues and identity issues - it has erased a fifty-year course, passed various phases of development and mutation reaching our days. The Carnival Blonde has to show a series of events around music, dance and theater, exhibitions with visual or other content, lectures, book presentations and film screenings. During these two weeks of events in the city of Xanthi very important position occupies another form of social performance, the feast, which is encountered in many different places and forms. The institution closes with the carnival parade and the custom of burning the Tzaros effigy.

THE YOUTH CELEBRATIONS

The third festive institution, the Youth Celebrations, took place in late Spring, started in the same year as the Old Town Celebrations and, as the title reveals, it is focused on the student youth of the city. These celebrations enable students to become protagonists both on the stage and the audience. Thus the inhabitants of the city know the events of the urban area either through a process of creation - production or through a participation procedure - consumption.

HADJIDAKIS FESTIVAL

This is the Hadjidakis Festival "Xanthi: Cities of Musical School Dreams" which was inaugurated in 2014, in honor of the great Greek Composerwho was born and raised in Xanthi. The festival offers the opportunity to Music Schools from all over Greece to be presented at the Municipal Amphitheater of the city, but also in selected squares in various parts of the city.

THE DEMOCRITUS UNIVERSITY OF THRACE

HISTORICAL BACKGROUND

Democritus University of Thrace (DUTH) was established in July 1973 by Legislative Decree No. 87 of July 27, 1973, and began its operation during the academic year 1974-1975. As mentioned, it was named 'Democritus' in honor of the ancient Greek philosopher Democritus, who hailed from the city of Abdera in Thrace. The administration of DUTH is based in Komotini, which is the capital of the Administrative Region of Eastern Macedonia and Thrace.

DUTH plays a significant role in strengthening the national and cultural identity of the Thrace region and contributes to the high standard of higher education in Greece. Through its quality of teaching and level of research, it has secured a place among the best Greek Higher Education Institutions (HEIs). As a Higher Education Institution, DUTH is a Public Law Legal Entity with full self-governance. It is supervised and subsidized by the State through the Ministry of Education and Religious Affairs.

Today, DUTH operates ten (10) Schools comprising twenty-eight (28) Departments, located in six cities across Thrace: five (5) in Xanthi, nine (9) in Komotini, four (4) in Alexandroupoli, five (5) in Kavala, one (1) in Drama, two (2) in Orestiada, and two (2) in Didymoteicho. A total of approximately 42,000 students are enrolled at DUTH. In more detail, the following Departments currently operate per city (the year in parentheses indicates the start of operation for each Department):

<u>XANTHI</u>
1. Department of Civil Engineering (1974)
2. Department of Electrical and Computer Engineering (1975)
3. Department of Environmental Engineering (1995)
4. Department of Architecture Engineering (1999)
5. Department of Production and Management Engineering (2000)

<u>KOMOTINI</u>
1. Department of Law (1974)
2. Department of Physical Education & Sport Science (1984)
3. Department of Humanities (2024)
4. Department of Social Policy (1994)
5. Department of Social Work (1996)
6. Department of Economics (1999)
7. Department of Political Science (2009)

<u>ALEXANDROUPOLI</u>
1. Department of Medicine (1985)
2. Department Education Sciences in Early Childhood (1987)
3. Department of Primary Education (1986)
4. Department of Molecular Biology and Genetics (2000)
5. Department of Nursing (2007)

<u>KAVALA</u>
1. Department Informatics (2019)
2. Department Physics (2019)
3. Department of Chemistry (2019)
4. Department of Management Science and Technology (2019)
5. Department of Accounting and Finance (2019)

<u>DRAMA</u>
1. Depart. of Viticulture and Oenology (2024)
2. Depart. Natural Environment and Climate Resilience (2024)

<u>ORESTIADA</u>
1. Department of Forestry and Environment and Natural Resources (1999)
2. Department Agricultural Development (1999)

<u>DIDYMOTEIXO</u>
1. Department of Psychology (2023)

ADMINISTRATION OF D.U.Th.

The administration of D.U.T.H. is exercised by the Governing Council, the Senate, the Rector, the Vice-Rectors, and the Executive Director (Law 4957/2022).

The Governing Council consists of eleven (11) members: six (6) internal and five (5) external members (Art. 8, Law 4957/2022). The Senate consists of the Rector, the Deans of the Schools, the Chairs of the Departments, one representative from each category of Special Teaching Staff (E.E.P.), Laboratory Teaching Staff (E.DI.P.), and Special Technical Laboratory Staff (E.T.E.P.), as well as student representatives at a rate of ten percent (10%) of the total number of Senate members (Art. 16, Law 4957/2022). The Rector is elected from among the internal members of the Governing Council following a vote by the Council (Art. 11, Law 4957/2022). The Rector proposes the Vice-Rectors and their areas of responsibility, who are then appointed by decision of the Governing Council (Art. 12, Law 4957/2022). The Executive Director, who reports directly to the Governing Council, is selected following a public call for interest (Art. 17, Law 4957/2022).

The Rectoral Authorities of D.U.T.H. are the following:

Rector: F. Maris

Professor of the Department of Civil Engineering

Vice Rector for Finance, Planning & Development: C. Chalioris

Professor of Department of Civil Engineering

Vice Rector for Academic Affairs, Student Affairs & Lifelong Learning: M. Grigoriou

Professor of Department of Molecular Biology and Genetics

Vice Rector for Research & Innovation:

G. Broufas

Professor, Department of Agricultural Development

Vice Rector for Administrative Affairs:

V. Gourgoulis

Professor of Physical Education and Sports Science

On the page Democritus of the University of Thrace:

http://www.duth.gr

ADMINISTRATION OF THE SCHOOL OF ENGINEERING

The governing bodies of the School of Engineering are the General Assembly, the Deanery, and the Dean. The General Assembly is composed of the General Assemblies of the Departments, while the Deanery consists of the Dean, the Chairs of the School's Departments, and one student representative from each Department.

The Dean is elected for a three-year term by an electoral college consisting of the combined electoral bodies that elect the Chairs of the Departments belonging to the School.

For the academic year 2025-2026, the administration of the School of Engineering is as follows:

Dean :

A. Gasteratos

Professor of the Department of Production and Management Engineering

Deputy Secretary:

T. Spanidou

This page is a Technical School Jewel:

http://www.eng.duth.gr

LIBRARY OF THE SCHOOL OF ENGINEERING

The Library holds 75,000 volumes and 2,000 journal titles, with current subscriptions being primarily electronic. Lending is conducted in accordance with the Operating Regulations of the Central Library, as approved by the Senate.

The library is accessible via the internet. On its webpages, interested parties can search for books belonging to the School of Engineering as well as all other Schools and Departments of the University, along with all academic libraries in the country that provide corresponding network services.

Through the HEAL-Link network, the library provides access to 5,000 journal titles. Instructions on how to search for information are provided by the library staff. Additionally, students can stay informed through the library's respective webpages.

Library Hours:

Monday - Friday: 07.00 - 14.30

Hours of Reading Room:

Monday - Sunday: 07.00 - 24.00

Library page:

http://www.lib.duth.gr

STUDENT CARE

Responsible: E. Kravaritou
Webpage: https://duth.gr/Η-ζωή-στο-ΔΠΘ/Υπηρεσίες-προς-τους-Φοιτητές

Catering Services

Free meals are provided to the students of the School of Engineering, subject to certain conditions. Information regarding the categories of students eligible for free catering, as well as the required supporting documents and submission deadlines, is provided by the Student Welfare Office in Xanthi.

Housing

The Student Residence Hall provides a large number of rooms, which are primarily distributed across buildings within the University Campus. It also features a restaurant with a seating capacity of 1,000 people.

Criteria for admission to the Residence Hall include the student's financial status in relation to the number of family members, as well as other criteria defined by the D.U.T.H. Senate in the Residence Halls' operating regulations.

Applications, along with the relevant supporting documents for newly admitted students, are submitted during the same period as the registrations for the respective Schools. No applications will be accepted after this deadline.

HealthCare

University students are provided with medical, hospital, and pharmaceutical care (Presidential Decree 327/1983 (GG 117/7-9-83 vol. A')). Medical care is provided by city doctors who are contracted with the State.

Undergraduate and postgraduate students of Higher Education Institutions (HEIs), both domestic and foreign, are entitled to healthcare, pharmaceutical, and hospital coverage. After the expiration of the period stipulated as the minimum duration of undergraduate studies for a department, increased by two (2) years, all types of student benefits are no longer granted; these include healthcare and hospital care, performance scholarships, scholarships for financial aid loans, free meals, housing, provision of textbooks or other study aids, transportation discounts, etc. (Art. 9 par. 10 of Law 2083/92).

COUNSELING AND ACCESSIBILITY UNIT (Do.Sy.P.)

The Counseling and Accessibility Unit (Do.Sy.P.) of the Democritus University of Thrace was established by the Senate Decision No. 40/51/12.12.2017. It began its operation in 2018 and, during its initial phase, it is funded by the NSRF 2014-2020 through the Action 'Support for Social Welfare Interventions for D.U.T.H. Students.

The purpose of Do.Sy.P. is to promote constructive learning, academic success, and the socialization of D.U.T.H. students with special needs and disabilities.

The aim of the Do.Sy.P. is:

- Equal access to educational activities for students with special needs and disabilities, through the adaptation of the learning environment, the utilization of assistive information technologies, and the provision of services that facilitate access to campus facilities and knowledge.
- Personal development and the improvement of the social life of students with special needs and disabilities, both inside and outside the educational environment.

In particular, Do.Sy.P. develops actions to address issues related to the following areas:

- Studies: learning difficulties, study and comprehension challenges, difficulty in decision-making, inability to concentrate, exam anxiety, and incompatibility of educational spaces, equipment, and materials due to disability.
- Academic life: difficulties adapting to the educational environment, challenges in organization and time management, negative attitude towards the field of study.
- Social life: difficulties in friendly and family relationships, isolation, low self-esteem, difficulties in acceptance and integration into the social environment.
- Other issues: psychosomatic disorders, emotional problems, addictions.

The Central Office of Do.Sy.P. is based in Komotini, with branches in the cities of Xanthi, Alexandroupoli, and Orestiada.

It is scientifically supervised by members of the Academic Staff (D.E.P.) with expertise related to its mission and consists of the Counseling and Psychosocial Support Department and the Accessibility Department.

<u>Communication:</u>

Call center: 25310-39050, -39163

E-mail: dosyp@duth.gr

<u>Website of the Board:</u>

https://dosyp.duth.gr

Department of Counseling and Psychosocial Support

The Department staffed of Psychiatrist, psychologists and social workers.

Services

- Individual counseling for students who have difficulties with studies (learning difficulties, difficulties in studying and understanding, inability to concentrate, stress tests) or with other issues of a psychological and social nature.
- Periodic assessment of the psychosocial needs of students.
- Group counseling.
- Networking of students with health services and social services of the region.
- In case of need to address.

Workshops / Seminars

Organization of seminars and workshops with an experiential and interactive character aimed at the empowerment and personal development of students

Volunteerism

Organize a network of volunteers with the aim of creating socialization and voluntary activities in the wider community.

Accessibility Pane

The Department is staffed by Electrical Engineers and Computer Engineers.

Please contact your doctor or pharmacist

- Adapting the education environment by utilizing digital accessibility tools;
- Designing accessible library and internet workstations.
- Create a digital environment for counseling, psychosocial support and accessibility actions.
- Convert educational materials and projects to an accessible format.
- Personalization of assistive technology by applicant student and training in the use of assistive technologiesand software.

Accessibility Services to Buildings and Infrastructure of Duth

- Study on the accessibility of buildings and other infrastructure.
- Evaluate amendments to improve accessibility of Duth buildings and provide knowhow to other entities.

Teaching Assistance Software

Offered free software and assistive technology applications.

Volunteerism

The Accessibility Department collaborates with volunteers on actions to convert educational materials into accessible format.

STUDENT PASS

Students submit their application for the pass electronically through the website: https://submit-paso. minedu.gov.gr using the personal codes of electronic access on the portal of the School of Engineering: https://unistudent.duth.gr/.

Thereafter, and after the application is approved by the relevant Secretariat, each student may receive his Bulletin from the specific point of delivery chosen at the time of the application. The delivery points have been identified as certain commercial stores as they have been identified by the project contractor.

The final cost of receiving the Bulletin, after the relevant competition, is 2.56 euro (incl. VAT).

The new pass is a credit card type, meets all the modern specifications, with built-in photo of the beneficiary, a special security hologram and its elements in Latin characters (for use on the outside).

The beneficiaries of the new special ticket are:

(1) Students of the first course of study provided that they have not exceeded the n+2 years of study (where n is the duration provided for in the indicative program of studies).

(2) Students of the second course of study for as many years as they study, in accordance with the indicative program.

(3) Students of the third course, for 4 years from the date of their enrollment.

Please note that students who have exceeded the 29th year are not entitled to a pass (29) year of their age, on the day of submission of the application or have been admitted with qualifying examinations. Furthermore, the discontinuation of student status for any reason automatically entails termination of the right to hold the pass, which in this case is returned to the secretariat of the Department concerned.

Each Secretariat is connected to the Central Information System through a dedicated online application from which to monitor students' applications.

First-year students, until 30 September, can make use of public transport, with the corresponding discounts, by showing the certificate of registration in the Department, issued by the Secretariats and their police identity, until they receive their official Bulletin.

TRANSPORT

The students are served (for their move to the Campus where the rooms of the Student Dorm are located, the Student Club restaurant and the new buildings of the Department), by means of transport chosen by the University, as well as by emergency routes University - Student Club during lunch hours starting from the bridge of the Samakov district.

CULTURAL EVENTS

Students have at their disposal a number of Cultural Events of the Municipality of Xanthi, as mentioned above. Also the two student clubs "Bridge" and "Inmates of the Student Center of Xanthi" organize cultural events of photography, cinema etc.

MILITARY CONSCRIPTION

Students who have not fulfilled their military obligations are entitled to deferment of conscription for the completion of their studies.

The postponement shall be granted for a period equal to that resulting from the accounting aggregation of the year of granting the postponement and the study years plus two.

Further information can be obtained from the local recruitment offices.

COMPUTE CENTER - NETWORK MANAGEMENT CENTER

Director: N. Kasapidis

Personal: N. Grigoriadis

I. Plevridis

P. Hatzopoulos

The Computational Center of IFRS it began operating in 1976 with the installation of the first UNIVAC 90/30 computer system and was basically used by the Polytechnic School. Today the Computational Center - Network Management Center of MESS is an institutionalized body, operating by organization, approved by Senate decision, and serves the entire University that is spread throughout Thrace, with DUTHnet, it has a plethora of computers, and all modern applications such as email, high-speed Internet access and more.

By decision of the Senate (21/01/18, September 2014) from September 2014 a new Commission with the title of 'Communications and Networks Committee' of IFRIC which replaces the previous Computational Center and Network Management Committees, and Telecommunications Committee that are being abolished.

Y.K. Website - N.A. :

http://www.noc.duth.gr

OFFICE FOR INTERCONNECTION BETWEEN STUDIES AND CAREER

Head: D. Tsitsis

The Liaison Office of the Democritus University of Thrace was established as part of the Operational Program of Education and Initial Vocational Training (EPAE). Through this newly established institution, the Liaison Office is an information center for students and graduates of our University, aspiring to become a link between the University and the Production Community, so that it can help its students and graduates to reach the professional rehabilitation phase smoothly. The special feature of the office lies in the fact that due to the diaspora of the University in more cities, there are currently three different branches in the cities of Xanthi, Komotini and Alexandroupolis.

Study Liaison Office website and

In the course of a career:

https://dasta.duth.gr

The absence of staff/students from room/lab photographs is due to privacy reasons

ERASMUS

Coordinator for the Civil Engineering Department:

D. Tsirigoti, Assi. Professor

The Erasmus+ program is the main education and training program in the EU, focusing on student and staff mobility and cooperation between higher education institutions. Erasmus+ supports the creation and establishment of the European Charter of Higher Education, thus increasing innovation, growth and employment.

Through the program, the students are offered the following possibilities:

1) Student exchanges for course monitoring at European universities with mutual recognition of educational programs by sending and hosting universities. This is done with the implementation of the provisions of the European Credit Transfer and Accumulation System (European Credit Transfer and Accumulation System ECTS) and a similar system at the host university. Under the Bilateral Agreements that the University has concluded with foreign institutions, the students of the Civil Engineering Department of the IPOA. may go to study at one of these Institutions for a period which may not be less than 3 months or more than one year. The conditions for participation are detailed at the website, http://erasmus.duth.gr/node/4.

2) Practical traineeships lasting 2 to 4 months, in bodies such as Business, Non-Governmental Organizations, Research Centers, Educational Institutions, diplomatic missions etc from students from all courses (pre-graduate - postgraduate - candidates) and recent graduates of the Duth in European countries (http://erasmus.duth.gr/node/16). In both cases, the Erasmus+ program provides participants with a scholarship to cover the additional costs they will face, exemption from foreign tuition fees and recognition of the period of studies they are undergoing at the foreign University or organization. The International Relations Office of the Duth has the general and financial management of the Erasmus+ Program for the outgoing and incoming mobility of students for studies and placements, teachers for teaching and staff for training.

For the Department of Civil Engineering, Academic Coordination is the Erasmus Committee of the Department, which is composed of 3 members of the faculty. The Committee shall define in advance the procedure for the selection of students to be included in mobility, publish calls for expression of interestand select students on the basis of criteria. The Erasmus+ Committee of the Department has drawn up a roadmap to assist outgoing students on the actions before and after their movement with a view to making the most useful use of the time of study at the host institution or organization and to recognizing their progress.

For studies abroad the Department of Civil Engineering D.U.Th. has concluded the following active Cooperation Agreements with universities (by country):

Germany: Ruhr-Universität Bochum
Technische Universität Dortmund

Spain: Universidad de Granada

Italy: Università degli Studi della Tuscia
Politecnico di Bari

Cyprus: Cyprus University of Technology

Hungary: Buda pest i Műs zaki és Gazdaságtudományi Egyetem

Romania: Technical University of Cluj-Napoca

Turkey: Kırklareli Üniversitesi

For the traineeship, the Commission is recommended to students will be able to contact the host institutions where the practical training will take place and to obtain a Letter of Acceptance and Working Program, in which the detailed program of the traineeship will be described in detail, as well as the tasks of the trainee which should be relevant to the subject of the study. The letter will be submitted together with the other necessary supporting documents in the application file. The Department of Civil Engineering supports and encourages mobility through the Erasmus+ because it considers that:

- It contributes to the interaction and familiarization of students of the department with the culture and cultureof other Countries.
- It offers outgoing students the opportunity to familiarize themselves with educational systems in other Countries and the working environment in them.
- It offers the further learning of foreign languages and technical terminology.
- Creates a framework for new academic and professional possibilities
- It contributes to the further academic constitution of students.

More information can be found in the relevant regulation posted on the website of the Department (link) .

IAESTE

https://iaeste.duth.gr

Head: T. Papadopoulos,
Ass. Professor of Duth

I.A.E.S.T.E. (International Association for the Exchange of Students for Technical Experience) is an international organization, for the purpose of exchanging students of applied disciplines (Technical University, Economics Universities, etc.) between the countries - members of the organization, for practical exercise related to the subject of their studies, outside the limits of their country.

In our country he is represented by the I.A.E.S.T.E National Council. Greece and in cities with Universities involved by the Local Committees. The Technical School of Xanthi has been established and operates the Local I.A.E.S.T.E Committee of Xanthi. The aim of this Committee is to find each year a number of reception places for foreign students inGreek companies. These posts ensure the possibility of sending students of the Xanthi Engineering School to countries abroad for internships, which is considered so essential for engineering studies, that many of the departments of the Engineering School of Xanthi have included it in their curriculum.

Europe Direct Xanthi

https://europedirect.duth.gr

The Europe Direct Information Center - Xanthi is one of the European Union's primary tools for informing European citizens about the EU. It provides citizens with impartial, immediate, accurate, and high-quality information services, advice, assistance, and answers to questions regarding the EU. Since 2013, it has been hosted by the Democritus University of Thrace and is a member of a large network consisting of 17 such Centers in Greece and 500 across all member states.

THE DEPARTMENT OF CIVIL ENGINEERING

ΔΗΜΟΚΡΙΤΕΙΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΡΑΚΗΣ DEMOCRITUS UNIVERSITY OF THRACE

ADMINISTRATION OF THE DEPARTMENT

The governing bodies of the Department are the Assembly, the Board of Directors, the Chair, and the Vice-Chair of the Department, the Directors of the Divisions, and the Division Assemblies. The competencies of these bodies are determined by current legislation (Law 4957/2022).

The Department Assembly consists of the Chair, the Vice-Chair, the Directors of the Divisions, the Academic Staff (D.E.P.) members of the Department, one representative from each category of Special Teaching Staff (E.E.P.), Laboratory Teaching Staff (E.DI.P.), and Special Technical Laboratory Staff (E.T.E.P.), and student representatives corresponding to fifteen percent (15%) of the total number of the Department Assembly members. The Board of Directors is composed of the Chair and the Vice-Chair of the Department, the Directors of the Divisions, and one (1) of the three (3) elected representatives of the E.E.P., E.DI.P., and E.T.E.P. categories. The Chair and the Vice-Chair of the Department, as well as the Directors of the Divisions, are elected for a two-year (2) term.

Chair: Ch. Akratos, Professor
Vice-Chair: G. Botzoris, Professor
Head of Secretariat: P. Tsompanaki
Student Affairs
Undergraduate Program: S. Ioakeimidou
Postgraduate Studies: O. Chavra
Protocol and Dispatch Office: O. Chavra.

Website of the Civil Engineering Dep.
http://www.civil.duth.gr

Former Presidents of the Chamber

Iliadis L.	2020 - 2025
Elenas A.	2018 - 2020
Elenas A.	2016 - 2018
Michalopoulou M.	2016 - 2016
Karayiannis Chr.	2014 - 2016
Karayiannis Chr.	2012 - 2014
Chrysanthou V.	2010 - 2012
Karayiannis Chr.	2008 - 2010
Karabinis A.	2006 - 2008
Karabinis A.	2004 - 2006
Diamantis J.	2002 - 2004
Diamantis J.	2000 - 2002
Matsoukis P.F.	1995 - 2000
Xalioulias A.	1993-1995
Sideris K.	1991-1993
Sideris K.	1989-1991
Gdoutos E.	1987 - 1989
Loukakis P.	1985 - 1987
Koutitas X.	1984-1985
Stefanis B.	1983 - 1984
Kotsovinos N.	1982-1983

On the Civil Engineering Department page:
http://www.civil.duth.gr

STRUCTURE OF THE CIVIL ENGINEERING DEPARTMENT

Today the Department of Civil Engineering consists of the following Fields:

- Sector of Construction Science
- Sector of Transport and Communications
- Sector Hydraulic Works
- Sector of Geotechnical Engineering
- Sector of Mathematics, Programming and General Lessons

The Domains are subdivided into Laboratories as follows:

♦ Sector of Construction Science
- Laboratory of Static and Dynamics of Construction
- Laboratory of Reinforced Concrete and Earthquake Structures
- Laboratory of Metal Construction
- Laboratory of Technical Engineering
- Laboratory of Building Desing
- Laboratory of Construction Materials

♦ Sector of Transport Projects and Communication
- Laboratory of Road and Road Safety
- Laboratory of Transport Technique and Design-Organization of the Site

- Sector of Hydraulics works
- Laboratory of Hydraulic Engineering and Environment
- Laboratory of Hydrology and Hydraulics Works
- Laboratory of Coastal and Harbour Engineering

* Laboratory of Sanitary Engineering - Water and Waste Quality

♦ Sector of Geotechnical Engineering
- Laboratory of Soil Engineering and Foundations
- Laboratory of Technical Geology and Groundwater Research

- Sector of Mathematics, Programming and General Lessons
- Laboratory of Organization and Planning
- Laboratory of Mathematics and Informatics in Science of Civil Engineering
- Laboratory of Geodesy

*The laboratory is staffed by members of the Academic Staff (D.E.P.) of the Division of Hydraulic Engineering of the Department of Civil Engineering and by members of the Academic Staff of the Department of Environmental Engineering (GG 1004, B', 04-03-2022).

HYDRAULIC ENGINEERING AND ENVIRONMENT

MODULE

The main object of the Master program is: the high-level specialization in the latest developments in the wider field of Hydraulic Engineering and Environment.

The aim of the program is: (a) The high-level graduate education, research and specialization for the production of new knowledge in modern areas of Hydraulic Engineering and the Environment. (b) The promotion of scientific research carried out internationally in this field of Civil Engineering. (c) The establishment of scientists - researchers who will have the infrastructure and the necessary resources for the production of independent and original scientific research and for the supply of specialized work. (d) More effective response to the needs of the country in civil engineering engineering in relation to hydraulic engineering and the environment, with the production of specialized graduates with techniques and skills related to the design and implementation of hydraulic, hydroenergy, port and coastal projects and water resource management projects.

CATEGORIES OF GRADUATES

Graduates of all University Departments and Faculties and Technical Universities of a similar subject can be admitted to the Master Program.

DURATION OF STUDY

The duration for the award of the Master degree is set at two (2) semesters and in the summer period (intensive program).

LESSON PLAN

The total number of credit units (ECTS) required to acquire the Master Degree is 75.

The award of the Master Degree requires the successful examination in the prescribed courses and the successful evaluation of diploma dissertation.

The teaching of each course lasts for one academic semester and corresponds to six (6) ECTS. Methods of in-person teaching, systems and web-based applications for synchronous distance learning, intensive courses, and any other method deemed appropriate for the smooth operation of the educational process may be utilized. Teaching is conducted entirely (100%) through synchronous distance learning tools. The Department of Civil Engineering possesses the necessary infrastructure to support this, such as licenses for suitable videoconferencing and e-learning software (Microsoft Teams), which are provided free of charge to all instructors as well as undergraduate and postgraduate students. The educational material is available to postgraduate students via the D.U.T.H. e-class platform, where lecture files for postgraduate courses, exercises, other auxiliary educational materials, and open-access books are posted. Attendance is mandatory. Each postgraduate student must attend and successfully pass a total of ten (10) courses. Furthermore, postgraduate students are required to complete a Master's Thesis, which corresponds to fifteen (15) ECTS.

LANGUAGE OF TEACHING AND OF THE PREPARATION OF DIPLOMATIC WORK

The courses are taught in Greek, but a total or partial structure of studies in English is possible when the number of foreign-language postgraduate students per course exceeds five (5). The language of the writing of the Diploma Thesis is Greek and in special cases English.

STAFF

A total of 25 instructors are employed for the implementation of the Postgraduate Program (M.Sc.). Of these, 8 are active Academic Staff (D.E.P.) members of the Division of Hydraulic Engineering, another 10 are active Academic Staff (D.E.P.), Laboratory Teaching Staff (E.DI.P.) members, and Professors Emeriti of the Department of Civil Engineering, 1 member of the Academic Staff comes from the Department of Forestry and Management of the Environment and Natural Resources of D.U.T.H., 1 member of the Academic Staff from the Department of Geology of the Aristotle University of Thessaloniki (A.U.T.H.), and 5 are external collaborators. Consequently, 72% of the instructors consist of Academic Staff (D.E.P.) and Laboratory Teaching Staff (E.DI.P.) members of the home Department, or instructors according to Presidential Decree 407/1980 (A' 112), or Article 19 of Law 1404/1983 (A' 173), or paragraph 7 of Article 29 of Law 4009/2011. In detail, the instructors of the Postgraduate Program are the following:

DIVISION OF HYDRAULIC ENGINEERING ACADEMIC STAFF (D.E.P.)

1. PROFESSOR KAGKALOU I.
2. PROFESSOR ANGELIDIS P.
3. PROFESSOR MARIS F.
4. PROFESSOR AKRATOS CH.
5. ASSOC. PROFESSOR SPILIOTIS M.
6. ASSOC. PROFESSOR SAMARAS A.
7. ASST. PROFESSOR TSOUKALAS I.
8. ASST. PROFESSOR MAKRIS CH.

DEP. of CIVIL ENGINEERING

1. PROFESSOR ILIADIS L.
2. PROFESSOR MARKOU I.
3. ASST. PROFESSOR ROVITHIS E.
4. ASST. PROFESSOR SIARKOS I.
5. ASST. PROFESSOR ASTERIOU P.
6. DR. PAPALEONIDAS A. (LABORATORY TEACHING STAFF - E.DI.P.)
7. PROFESSOR EMERITUS CHRYSANTHOU V.
8. PROFESSOR EMERITUS DIAMANTIS I.
9. PROFESSOR EMERITUS PAPADOPOULOS V.
10. PROFESSOR EMERITUS PLIAKAS F.-K.

DEPARTMENT OF FORESTRY AND MANAGEMENT ENVIRONMENT AND NATURAL RESOURCES

1. ASST. PROFESSOR PAPAIOANNOU C.

DEPARTMENT OF GEOLOGY (A.U.T.H.)

1. ASST. PROFESSOR KAZAKIS N.

EXTERNAL COLLABORATORS

1. DR. NIKOLOPOULOS D.
2. DR. STAVRAKAKIS I.
3. DR. AVGERIS L.
4. DR. PAPADOPOULOS CHRISTOF.
5. DR. ADAMIDIS A.

DIPLOMA SUPPLEMENT

The Master Programm “Hydraulic Engineering and Environment” from the academic year 2018-2019 grants to the graduate students/-students of the Diploma Supplement in Greek and English language.

The Diploma Supplement follows the model developed by the European Commission, the Council of Europe and UNESCO/CEPES. The aim of the Annex is to provide sufficient independent data to improve the international "transparency" and fair academic and professional recognition of qualifications (diplomas, degrees, certificates, etc.).

It was designed to give a description of the nature, level, background, content and status of the studies, which were successfully completed by the person named in the original of the title to which this annex is attached.

PLAGIARISM

The students and students of the Department assume the responsibility not to fall for the offense of plagiarism. If plagiarism is established, disciplinary proceedings shall be instituted as provided for in the Foundation Regulation.

The work is also subject to electronic control plagiarism by the teacher/teacher.

Any work submitted, undergraduate or postgraduate or doctoral, is accompanied by the following affidavit, which is attached to the final text before the contents page of the work:

“I confirm that I am the author of this work and that I have stated or referred to it, explicitly and specifically, all sources from which I have used data, ideas, suggestions or words, whether they are transposed precisely (in original or translated) or paraphrased. I also certify that this work was prepared by me personally especially for the specific research or the specific course/seminar/curriculum”.

In the event that Faculty member is found has committed plagiarism, is referred by the President of the Department to the Ethics Committee of the Foundation.

The Department of Civil Engineering adopts the draft of the MO.DI.P. A guide against plagiarism, available at the following hyperlink: https://modip.duth.gr/wp-content/uploads/2020/06/9.-%CE%9F%CE%B4%CE%B7%CE%B3%CF%8C%CF%82-%CE%B5%CE%BD%CE%AC%CE%BD%CF%84%CE%B9%CE%B1-%CF%83%CF%84%CE%B7-%CE%BB%CE%BF%CE%B3%CE%BF%CE%BA%CE%BB%CE%BF%CF%80%CE%AE.pdf

2025-2026 ACADEMIC CALENDAR

WINTER SEMESTER

Duration Of Instruction
From 27-10-2025 to 23-12-2025 and
From 07-01-2026 to 08-02-2026

Examination Period
From 09-02-2026 to 22-02-2026

Holidays
Tuesday 28-10-2025 (National Anniversary)
Monday 17-11-2025 (Polytechnic Anniversary)
Tuesday 06-01-2026 (Epiphany Day)

Christmas and New Year's Holidays
From 24-12-2025
to 06-01-2026

Local Holidays
Saturday 04-10-2025 (Liberation of the city of Xanthi)

SPRING SEMESTER

Duration of Instruction
From 23-02-2023 to 05-04-2026 and
from 18-04-2026 to 07-06-2026

Examination Period
From 08-06-2026 to 21-06-2026

Holidays
Clean Monday 23-02-2026
Wednesday 25-03-2026 (National Anniversary)
Friday 01-05-2026 (May Day)
Monday 01-06-2026 (Holy Spirit Day)

Easter Holidays
From M. Monday 06-04-2026
to Friday 17-04-2026

Repeat examination period for two semesters from 01-09-2026 to 21-09-2026

Summer Vacation
From 01-07-2026 to 31-08-2026

DECLARATION OF QUALITY POLICY

The Department of Civil Engineering, in cooperation with the Quality Assurance Unit (MODIP) of D.U.T.H. and the relevant services of the Institution, has aligned the Quality Policy of its Undergraduate Study Program (USP) and its offered Postgraduate (M.Sc.) and Doctoral (Ph.D.) Study Programs with the Quality Policy of the Democritus University of Thrace.

Mission

The Department of Civil Engineering is committed to working closely with students, businesses, authorities, and society for the dissemination of knowledge for the public benefit, the improvement of everyday life, and the provision of solutions to global challenges. The Department contributes collectively to society by focusing on modern education through student-centered learning based on action and experience, while also incorporating the digital transformation of sciences and the profession.

The Department educates Civil Engineers capable of operating, upon completion of their studies, in the study, design, synthesis, construction, supervision, and maintenance of the built or shaped environment, which includes indicatively: cities and infrastructure projects, roads, bridges, dams, buildings, industrial, handicraft and tourist units and complexes, tunnels, water and wastewater treatment plants, water supply and sewerage works and networks, ports, airports, transport networks, etc. (For details, see: 'Diploma Supplement of the Department of Civil Engineering, D.U.T.H.'). Furthermore, as part of its duty, the Department prepares its graduates by monitoring global developments in all areas of science, research, and the Civil Engineering profession, making its graduates eligible and competitive in the labor market and the academic environment. The Department provides education and research, with a balance between learning and application, through a modern and internationally competitive level curriculum .

Studying at the Department of Civil Engineering (DCE) of D.U.T.H. constitutes a modern educational experience for students, as the Department possesses: (a) modern facilities and laboratories, (b) highly qualified staff, (c) scientific personnel of international prestige, (d) scientific staff and students with distinctions at national and international levels, (e) an internal quality system, (f) extensive student welfare services, and (g) a presence in international university ranking lists, holding a distinguished position in the evaluation of Greek university education.

Vision

The JPM's vision is the continuous effort of quality, excellence and discrimination, making it a leading part of the map of higher education both in Greece and in Europe. The JPM invests in student-centered learning, the educational process, the human resources, but also in research, contributing to society and successfully addressing the challenges of the modern era by using the means of modern digital technology.

Course Content

The object of the FRP of the LBB is:

i) The creation through the training of a strong background in the science of Civil Engineering, through a student-centered learning process, which includes knowledge either classical or cutting edge technology, the acquisition of experience and practical application, analysis, synthesis and evaluation of data, limitations and possibilities.

ii) The preparation and direction of the professional career, eligibility and competitiveness of its graduates through the understanding of science with modern technological means and methods, based both on literature, research and modern digital media.

iii) The development of the ability of its graduates in the modern digital age, the ever-growing society, the rapid increase in knowledge and the changing requirements of the labor market, to continue their intellectual development and training, facing the fourth industrial revolution by acquiring new skills and competences,

iv) Knowledge with the tool of research (basic and applied) in both areas of Civil Engineering and interdisciplinary fields, monitoring the developments of science and expanding its scope.

v) Its contribution to the reconstruction and development of the wider region and the country, in cooperation with productive bodies and enterprises through self-energy, team work, excellence, research, innovation, production and entrepreneurship.

Please note that the Department:

1. It has adopted the credit system (ECTS) in accordance with the Bologna Accord.
2. The RSP and the PCF include courses in which the performance of students is shaped through actions, work, midterm exams, alternative exams and not only by a final written examination (formative evaluation),
3. Uses experiential learning methods (e. educational tours, experiential workshops, laboratory tests, etc.).
4. All the courses taught under the MSF and the MFA have course contours, which mention the titles of the 13 lectures (syllabus) and identify precisely additional activities and what part of the total ECTS cover (tasks, progress, workshops, off-class activities, etc.).
5. It grants an Annex to the Diploma in Greek and English.

Operation

An organizational culture has been formed in the Department for the way it operates. Assembly days have a regularity, but are rotated so that the same lessons are not lost all the time. For all issues that arise, committees are set up, which, after having investigated them from all angles, are recommended to the General Assembly, which takes the final decisions. The computerization of the Department includes a number of information systems, such as (a) the Electronic Secretariat System (universis), (b) the Integrated Information System (IQS) of the ICP MOD, (c) the Project Management Information System (resCom) of the ICP ICP, (d) the Library Information System of the ICP, (e) the ICP Information System the ICP Electronic Assessment System; There are fixed procedures and stable rules for the allocation and management of funding from each source. The LVP's logistical infrastructure is state-of-the-art and in excellent condition, as it was recently built and delivered for use in 2016. There is regular monitoring, and to address any emergency problem prepared help desk of the LBB Technical Service, where any member of the LVP identifies it, registers it, so that it is either directly handled or planned to be restored. The workshop's logistical infrastructure is in good condition and is periodically renewed and maintained either from research funds, either from the regular budget, or from the submission of proposals to finance equipment of the AMTH Region or the central government. The arrangements for replenishing the courses are decided by the General Assembly to cover the 13 weeks of instruction provided for by law. There are traineeships, mobility regulations, etc. and are posted on the website of the Department, or of the D.U.Th. There are predefined procedures and rules for student selection and all procedures are completely transparent.

Strategic planning

The strategic objectives of the Department are linked to those of the Foundation and include:

- Providing high-level education, with an emphasis on student-centered learning, the continuous upgrading of the MSP and the MFA through the institutionalized annual review process of the MFA and the MFA and the updating and standardization of academic functions and focus on Learning Objectives and Learning Outcomes
- Improving the connection with the labor market, scientific bodies and graduates of the Department.
- To improve the production of high-level research based on international developments by promoting research cooperation and the exploitation and dissemination of results for the benefit of the economy and society.
- Support for Department funding through research programs by public and private bodies.
- Promotion and recognition of excellence and innovation by encouraging, strengthening and rewarding the achievements of students and members of the university community in teaching and research, successes in student competitions, discrimination in competitive submission of innovative proposals, student work awards, etc.
- Strengthening extroversion by strengthening and promoting partnerships, networking and publicity actions and the international presence of the Department, through internationalization actions and benchmarking with universities of similar size, emphasizing the Department's distinction at local, national and international level.
- Efficiency of the administrative procedures and improvement of the infrastructure of the Department giving priority to Student Care and the strengthening of laboratory and educational equipment.
- Creation of a unique personality that makes the ICP ICP and its graduates unique in relation to the like Departments of higher education in Greece, attracting more students.
- Foster a two-way supply society between the academic community and students/graduates.
- Culture of quality and excellence.

At the same time, the strategic objectives of the Department are linked to the respective objectives of the Foundation which include:

1. Strengthening-upgrading the educational project.
2. Support-upgrade of research and of innovation.
3. Improve the amount and the absorption of funding.
4. Empowering and upgrading the human potential.
5. Strengthening and improving the management of the Foundation's infrastructure and services.

CURRICULUM

ΔΗΜΟΚΡΙΤΕΙΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΡΑΚΗΣ | DEMOCRITUS UNIVERSITY OF THRACE

1st Semester

Num.	Course Title	Specialization A	Specialization B	Specialization C	ECTS	HOURS
1	FLUID MECHANICS OF HYDRAULIC STRUCTURES	Y	E	Y	6	3
2	ADVANCED ENGINEERING HYDROLOGY – FLOOD DEFENSE PROJECTS	E	Y	E	6	3
3	APPLICATIONS OF COASTAL ENGINEERING, COASTAL AND HARBOUR WORKS	Y	E	Y	6	3
4	WATER RESOURCES MANAGEMENT AND AQUATIC SYSTEMS RESTORATION	Y	Y	E	6	3
5	NUMERICAL METHODS IN FLUID MECHANICS	E	E	Y	6	3
6	SPECIAL TOPICS IN RESEARCH AND MANAGEMENT OF GROUNDWATER AND GEOTHERMAL ENERGY	E	Y	E	6	3
Total	Compulsory (Y) 3 courses, Selection (E) 2 of 3	5	5	5	30	15

2nd Semester

Num.	Course Title	Specialization A	Specialization B	Specialization C	ECTS	HOURS
1	SANITARY ENGINEERING AND SPECIAL TOPICS IN WASTEWATER TREATMENT	Y	E	E	6	3
2	NUMERICAL MODELLING OF PROCESSES IN THE MARINE / COASTAL ENVIRONMENT AND IN WATERSHED-COAST SYSTEMS	E	E	Y	6	3
3	SEDIMENT TRANSPORT AND MOUNTAIN HYDRODISTRIBUTION WORKS	E	E	E	6	3
4	HYBRID MODELS (STATISTICAL AND FUZZY) IN HYDRAULIC ENGINEERING	E	E	E	6	3
5	HYDROGEOINFORMATICS	E	Y	E	6	3
6	WATER RESOURCES PROTECTION AND NATURAL DISASTER PREVENTION METHODS	E	E	E	6	3
7	RENEWABLE ENERGY: EXPLOITATION OF HYDRODYNAMIC AND MARINE ENERGY	E	E	E	6	3
8	GEOSYNTHETICS IN HYDRAULIC AND ENVIRONMENTAL ENGINEERING	E	E	E	6	3
9	POLLUTION AND PROTECTION OF GROUNDWATER RESOURCES	E	E	E	6	3
Total	Mandatory (Y) 1 course, Option (E) 4 of 8	5	5	5	30	15

Specialization A: Hydraulic Structures and Environment
Specialization B: Water Resources and Natural Disasters Management
Specialization C: Maritime Engineering and Environment

SUMMER SEASON

	DIPLOMA DISSERTATION				15	
	Total ECTS:				75	

COURSES DESCRIPTION

Winter Semester

1 FLUID MECHANICS OF HYDRAULIC STRUCTURES

Teacher: Angelidis P. Professor

This course will cover the following topics:

1. Hydrostatics - applications
2. Forces practiced on dams
3. Applications to forces exercised in dams
4. Cavitation Effect - Barbed Superflow Ventilators
5. Inflatable Dams
6. Bernoulli theorems - applications to flow problems
7. Bernoulli theorems - applications in non-permanent flow problems
8. Energy line, hydraulic gradient line, applications in water transport projects with closed conductors
9. Water turbines
10. Small hydroelectric projects
11. Dynamic and static stress from turbulent flow.
12. Turbulent flow, Reynolds equations
13. Turbulence models. Boundary layer

Once the course is completed, participant will be able to:

- To possess knowledge for the design and dimensioning of dams and inflatable dams
- To understand the dynamic and static stress from turbulent flow
- To apply the Bernoulli theorem for the design of various hydraulic works
- To analyze and calculate hydrostatic and other forces, exerted in various hydraulic works
- To combine and synthesize the knowledge he acquired, to deal with the phenomenon of cavitation in overflow and closed ducts
- Assess - in the context of the energy crisis - and plan small hydroelectric projects

Teaching Mode: 3 hours suggestion-exercises / week

2 ADVANCED ENGINEERING HYDROLOGY – FLOOD DEFENSE PROJECTS

Teachers:	Tsoukalas I.	Assis. Professor
	Maris F.	Professor
	Nikolopoulos D.	PhD in Civil Engineering
	Lalikidou S.	PhD Candidate

The course covers the following topics:

1. Rain-drainage models: model Lutz, model Soil Conservation Service
2. Rainfall and drainage models: black-box and physical models based on the unit hydrogram
3. Empirical and semi-empirical methods of calculating potential and actual vaporization as rain loss
4. Hydrological methods of flood passage through a reservoir
5. Hydrological methods for transiting flood through river section (Muskingum)
6. Flood prevention projects: flood prevention and traffic,
7. Flood protection projects in the mountainous part of a watercourse basin
8. Drought indicators
9. Frequency analysis of maximum or minimum values of rainfall heights and water supplies
10. Time series analysis
11. Numerical examples
12. HEC-HMS Hydrological Software
13. Subject (work at home) for the implementation of Sections 1, 3, 4 and 6

Upon completion of the course the student is able to:

- To possess the knowledge for the calculation of the water supply due to rainfall at the outlet of a catchment area.
- To possess the knowledge for the calculation of potential and actual vaporization as a category of rain losses.
- Apply his knowledge to the passage of a flood wave through a reservoir or through a section of a river.
- To combine his knowledge to design and dimensionalize flood containment and transit projects, as well as projects in the mountainous part of a watercourse basin.
- Assess whether there is extensive drought in a water catchment area.
- Evaluate the incidence of maximum or minimum values of rainfall heights and water supplies.
- To understand the extension of time in an artificial way of an existing time series of measured water supplies.
- Implement and understand HEC-HMS hydrological software.
- To combine his knowledge in order to be able to carry out hydrological studies in practice.

Teaching Mode: 3 hours suggestion-exercises / week

3 APPLICATIONS OF COASTAL ENGINEERING, COASTAL AND HARBOUR WORKS

Teachers:	Samaras A.	Assoc.Professor
	Rovithis E.	Asst. Professor

The course covers the following topics:

1. Specific issues of wind wave prediction/prediction and wave mechanics.
2. Specific issues of maritime traffic and level variations.
3. Specific issues of coastal stereotransfer and morphodynamic coastlines.
4. Specific issues relating to the planning of coastal and port projects I (advanced cargo calculation techniques, possible planning).
5. Specific issues relating to the planning of coastal and port projects II (technical and economic calculation of projects, vulnerability and reactance concepts).
6. Specific design issues for different types of ports I (commercial ports).
7. Specific design issues for different types of ports II (fishing ports).
8. Specific design issues for different types of ports III (comfort ports).
9. Coastal Zone Management and River Basin Systems - Coast (WACS).
10. Project design in the light of climate change (natural stress scenarios, technical-economic analysis, redesign and upgrading of projects).
11. Development of I-industrial studies (legislation, standards).
12. Preparation of Coastal Studies II (contents, Convoys PCE).
13. Personalized Work Semester: Presentation, Assignment, Elaboration with interactive teaching (solving queries and class corrections).

Once the course is completed, participants will be able to:

- Understand specific issues of wind wave forecasting/prediction, wave mechanics, marine traffic and level variations, coastal stereotransfer and coastal morphodynamics.
- They understand specific planning issues for coastal and port projects.
- They understand specific design issues for different types of ports.
- Understand coastal zone management practices and Basin-Coast Systems (WACS).
- They understand project design practices in the light of climate change.
- They understand the methodology of carrying out industrial studies (legislation, specifications, contents, UNHCR sessions).
- They combine and apply the knowledge they acquired for the design and study of port and coastal projects, examining them from a technical and economic point of view.

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Teaching Mode: 3 hours suggestion-exercises / week

4 WATER RESOURCES MANAGEMENT AND AQUATIC SYSTEMS RESTORATION

Teachers:	Akratos C.	Professor
	Kagalou I.	Professor
	Spiliotis M.	Associate Professor

The course covers the following topics:

1. Physical-chemical-biological processes in aquatic ecosystems
2. River basin management
3. Analysis of pressure in the catchment area/ uses and assessment
4. Indicators of the qualitative situation - Framework Directive 2000/60
5. Groundwater and the environment
6. Brackling of groundwater
7. Artificial groundwater enrichment
8. Water scarcity and water scarcity indicators, distinguishing between water scarcity and causes
9. Water demand.
10. Surface water potential of a water catchment area
11. Projects for the development of surface water resources
12. Comprehensive EDP with multiple criteria and choice of weights

Once the course is completed, participants will be able to:

- Knowledge of river basin management plans
- Understand water basin uses/pressures
- Apply quality assessment indicators
- Know technical and alternative rehabilitation methods
- Be aware of the principles of green infrastructure and nature-based solutions.
- Be aware of groundwater management issues
- Be familiar with techniques for treating groundwater brining
- Water scarcity and water scarcity indicators, distinguishing between water scarcity and causes
- Apply basic principles to the determination of water demand.
- Be able to estimate the surface water potential of a water catchment area and design a reservoir (from a hydrological point of view)
- Optimize the EDP
- Make complete EDP with multiple criteria and choice of weights, distance methods, entropy method and AHP for determining weights

Teaching Mode: 3 hours suggestion-exercises / week

5 NUMERICAL METHODS IN FLUID MECHANICS

Teachers: Makris Ch. Asst. Professor

This course will cover the following topics:

1. Finite Volumes I Method: Introduction and Spatial Differentiation (Computation Network Information and Variable Distribution),
2. Finite Volumes II method: Gauss theorem and calculation of flow quantities through the surfaces of computational cells.
3. Finite Volumes III method: Interpolation schemes, temporal differentiation and linear system solving.
4. OpenFOAM I Open Source Computational Engineering Software: General introduction to the structure, installation and basic use of the software.
5. OpenFOAM II Open Source Computational Fluid Engineering Software: Computational geometry design, creation and modification of computational networks.
6. OpenFOAM III Open Source Computational Fluid Engineering Software: Linear solvers, pressure-speed coupling, spatial and temporal discretization schemes.
7. OpenFOAM IV Open Source Computational Fluid Engineering Software: Simulations of permanent and non-permanent flows, introduction of initial and boundary conditions, running simulations with parallel processing.
8. OpenFOAM V Open Source Computational Fluid Engineering Software: Data processing during calculations, initialization and modification of resolution fields
9. OpenFOAM VI Open Source Computational Fluid Engineering Software: Data transformation, development of complex boundary and initial conditions,
10. OpenFOAM VII Open Source Computational Fluid Engineering Software: Qualitative and quantitative processing of resolution results.
11. Applications in the simulation of complex flows I: Turbulent flows and free surface flows.
12. Applications in the simulation of complex flows (I: Multiphase flows, particulate flows and diffusion flows).
13. Personalized Work Semester: Presentation, Assignment, Elaboration with interactive teaching (solving queries and class corrections).

After the section is completed, the participants are able to:

- They understand the basics of numerical analysis.
- They understand the basic equations of hydraulic and their methods of numerical solution.
- They understand the mathematical description and analysis of fluid mechanics problems.
- Analyze, understand and modify computational codes.
- Evaluate the correctness of numerical results and decide alternative strategies for resolution.
- They use programming tools for different applications (Civil Engineering problem solving, management, analysis and graphical data representation).

Teaching Mode: 3 Hours Suggestion-Workshop / Week

6 SPECIAL TOPICS IN RESEARCH AND MANAGEMENT OF GROUNDWATER AND GEOTHERMAL ENERGY

Teachers: Pliakas F.-K., Emeritus Professor
Siarkos I, Asst. Professor
Kazakis N., Asst. Professor

The course includes the following sections:

1. Elements of Hydrology, Groundwater Plumbing and Applied Hydrogeology
2. Marine penetration in coastal underground water bodies - 1 (hydraulic and hydrochemical elements, modern response trends and management parameters)
3. Marine penetration in coastal underground water systems - 2 (international and Greek experience) - Exercises
4. Management of groundwater enrichment - 1 (natural groundwater enrichment and climate change, methods, selection criteria, design and operation of artificial groundwater enrichment projects)
5. Management of groundwater enrichment - 2 (hydraulic, hydrogeological, technical and managerial elements of modern approaches, scientific activities)
6. Management of groundwater enrichment - 3 (surveys and applications in the international field and in Greece) - Exercises
7. Simulation of groundwater and computational codes - 1 (hydrogeological dummy, classification of simulation models of groundwater)
8. Simulation of groundwater and computational codes - 2 (computational codes, general principles of evaluation of simulation models of groundwater, cases of application in Greek space) - Exercises
9. Geothermal systems - Geothermal fields
10. Geothermal field survey methods
11. Geothermal Energy Applications: Direct Uses
12. Geothermal Energy Applications: Electricity Generation - Shallow Geothermal Energy
13. Problems: Environment - Economy - Management

After completing the course, the participants are able to:

· Identify hydraulic characteristics, elements and properties of groundwater bodies
· Combine, compose and adapt data, data and results of hydrological and hydraulic surveys and studies of groundwater
· Compare, assess the options for implementing actions and decide on the design and construction of technical projects, relating to the development and management of groundwater bodies, in particular: (i) the management of groundwater enrichment, (ii) the exploration and treatment of marine intrusion in coastal aquifers.
· To select and apply appropriate computational codes in the context of the simulation of groundwater.
· To analyze and evaluate data, data and research results related to the utilization of geothermal energy and to solve problems of use and exploitation of geothermal energy in relation to the various relevant energy needs and environment.

Teaching Mode: 3 hours suggestion-exercises / week

Spring Semester

7 SANITARY ENGINEERING AND SPECIAL TOPICS IN WASTEWATER TREATMENT

Teachers: Akratos C. Professor
Kagalou I. Professor
Stavrakakis I. PhD in Environmental Engineering

The course includes the following sections:

1. Concepts and Themes of Health Engineering (Contamination, Pathogenicity, Epidemiology Data, Waterborne Infections).
2. Waste water treatment methods.
3. Design/dimensioning conventional treatment plants with suspended biomass methods such as activated sludge, plants with attached biomass methods as well as natural wastewater treatment systems such as artificial wetlands and stabilization lakes.
4. Learning of waste water treatment plant design software Aqua Designer 8.1. and the budget calculation software of CAPDET processing units.
5. Modern trends in advanced wastewater and industrial wastewater treatment as well as sludge management.
6. Analytical biological adhesive and suspended growth processes for the removal of nutrient salts and micro-pollutants are presented, the modern trends in the treatment of liquid waste (MB R reactors, MBBR).
7. There are differences in methods of treatment of industrial and agro-industrial waste (anaerobic treatment, biological filters, membranes, natural treatment systems).
8. Modern methods for sludge treatment are presented (anaerobic digestion, energy utilization, nitrogen and phosphorus recovery from sludge).

After successful completion of the course the student is able to:

- Recognize the subject of Health Engineering.
- Apply mathematical water quality models.
- Analyze physico-chemical and biological/microbial indicator data.
- To combine and synthesize the acquired knowledge to protect aquatic systems and to respond to health crises
- To evaluate the health status of water bodies.
- To study, design, build, sewage treatment plants
- Know new techniques for urban and industrial waste water treatment

Teaching Mode: 3 hours suggestion-exercises / week

8 NUMERICAL MODELLING OF PROCESSES IN THE MARINE / COASTAL ENVIRONMENT AND IN WATERSHED-COAST SYSTEMS

Teachers:	Samaras A.	Assoc. Professor
	Makris Ch.	Asst. Professor

The course includes the following sections:

1. Process description equations in marine and coastal environment.
2. Numerical resolution methods and techniques.
3. Computational dummy structure.
4. Processing and analyzing field data and computational dummy input/output data.
5. Computational Dummy Applications I: Wind/Wave Circulation;
6. Computational dummy applications I: Ripple propagation
7. Computational dummy applications III: Estimating stereotransfer and morphodynamic changes.
8. IV Computational Dummy Applications: Project Interaction - Coastal Environment.
9. V modeling applications: Diffusion of oil pollution.
10. Holistic approach to simulation of Basin - Coast Systems (WACS) I: Methodology.
11. Holistic approach to simulation of Basin - Coast Systems (WACS) II: Tools.
12. Holistic approach to simulation of Basin - Coast Systems (WACS) III: Applications.
13. Personalized Work Semester: Presentation, Assignment, Elaboration with interactive teaching (solving queries and class corrections).

After completing the course, the participants are able to:

- They understand the process description equations in marine and coastal environments.
- They understand numerical resolution methods and techniques.
- They understand the structure of computational models.
- Understand the techniques of processing and analyzing field data and computational dummy input/output data.
- They understand the techniques of applying computer models.
- They understand the principles of a holistic approach to simulation of Basin-Coast Systems (WACS), with an emphasis on estuary systems and the coastal environment.
- They combine and apply the knowledge gained for the development and application of computational models to the above.

Teaching Mode: 3 Hours Suggestion-Workshop / Week

9 SEDIMENT TRANSPORT AND MOUNTAIN HYDRODISTRIBUTION WORKS

Teachers:	Chrysanthou V.,	Emeritus Professor
	Maris F.,	Professor
	Avgeris L.	PhD in Civil Engineering

The course covers the following topics:

1. Introduction. Physical properties of water
2. Flow characteristics
3. Fertile material properties. Sedimentation rate
4. Start moving fertile materials
5. Bed formations
6. Transportation of cargo bed. Transportation of cargo of suspended materials
7. Transport of total cargo
8. Localized erosion
9. Fertile transport models
10. Mountain hydronomy projects: Effect of fertile materials
11. Numerical examples
12. HEC-RAS Hydraulic Software
13. Topic (working at home) on the implementation of HEC-RAS

After successful completion of the course the student is able to:

- To apply basic knowledge of Hydraulics in the phenomenon of the transfer of fertile materials in watercourses and rivers.
- Evaluate grain curves.
- To possess the knowledge for the calculation of the sedimentation rate of suspended ferrals, critical flow rate and critical trolling voltage on the riverbed.
- To understand the effect of bed formations on the water flow and the transport of fertile materials on a river bed.
- To apply the appropriate equations for the calculation of load carrying bed and total load.
- Apply diffusion theory to the calculation of the transport of suspended ferments.
- Analyze the factors affecting local corrosion effect on bridge pedestals, downstream of barriers and open duct strictures, so as to be able to estimate the maximum depth of local corrosion.
- To apply the relationships between horizontal lengths, flow depths, ferryl densities and ferryl grains diameters to the physical models of the laboratory.
- To combine knowledge to design and dimensionalize a sedimentation tank.
- Evaluate the impact of fertile materials on mountain water projects.
- To implement the HEC-RAS hydraulic software with slide transfer.

Teaching Mode: 3 hours suggestion-exercises / week

10 HYBRID MODELS (STATISTICAL AND FUZZY) IN HYDRAULIC ENGINEERING

Teachers:	Spiliotis M.	Assoc. Professor
	Papadopoulos B.	Emeritus Professor
	Papadopoulos C.	PhD in Civil Engineering
	Bakas T.	PhD Candidate

The course covers the following topics:

1. Fuzzy logic and sets
2. A-sections
3. Compound incision and complement
4. Unclear numbers and extension of the rule
5. Comparison of fuzzy logic and statistics-fuzzy estimators
6. Max-min composition, vague logic
7. Intelligent systems with fuzzy logic
8. Fuzzy optimization
9. Fuzzy Multicriterion Analysis
10. Applications in Hydrology
11. Applications in the EDP
12. Applications in the EDP
13. Applications in the EDP

After successful completion of the course the student is able to:

- He distinguishes classical logic from fuzzy logic
- Elementary mathematical documentation of fuzzy logic
- To distinguish in which cases the ambiguous approach contributes to the problem and in which cases the classical approach or a hybrid approach is preferred
- Be able to apply intelligent systems to hydrology
- Be able to apply unclear systems to EDP decision-making

Teaching Mode: 3 Hours Suggestion-Workshop / Week

11 HYDROGEOINFORMATICS

Teachers: Maris F., Professor
Iliadis L., Professor
Papaioannou C., Asst.Professor
Papaleonidas A., E.D.I.P., PhD in Informatics

The course covers the following topics:

1. Introductory Concepts of Water Resource Management.
2. Water management software and systems.
3. Geospatial data for hydrology, spatial detail and map scale, coordinate reference systems (datum), data representation, metadata, digital terrain model.
4. Format hydrological data, check homogeneity, fill in, and extend data time series.
5. Surface formation, geospatial data production from point measurements, surface creation methods. Spatial variability.
6. Modeling of evaporation. Modeling of filtration. Hydraulic roughness and hydraulic drainage.
7. modeling hydrological processes.
8. Modeling of the unit hydrograph.
9. Development of reliable NON-linear estimation models of dependent hydrological variables
10. Development of N-dimensional non-linear ranking models (N dimensional classification) in water resource management using Computer Intelligence-Machine Learning
11. Artificial Neural Networks (NTN)
12. Support Vector Machines (MDY)
13. Fuzzy Logic (AL).

Software: Torrential-MIK, Esri ArcGis, Arc Hydro, Hec-Hms, Hec-Ras, Iric, Telemac, Erdas Imagine, Trimple eCognition, MATLAB 2016, WEKA (free open source), Neuralworks Professional II PLUS.

After successful completion of the course the participants are able to:

- Generate the primary input data of the models using Geographic Information Systems and remote sensing techniques.
- Model hydrological processes.
- To shape and solve water resource problems as optimization problems.
- Create and optimize water resource models that will act as decision support systems.
- Be able to develop non-linear models for estimating dependent hydrological variables.
- Assess the suitability for use of Computational Intelligence-Machine Learning techniques
- Propose and implement appropriate decision-making tools related to water problems.

Teaching Mode: 3 Hours Suggestion-Workshop / Week

12 WATER RESOURCES PROTECTION AND NATURAL DISASTER PREVENTION METHODS

Teachers:	Kazakis N.,	Asst. Professor
	Siarkos I.,	Asst. Professor
	Asteriou P.,	Asst. Professor

The course covers the following topics:

1. Water Resources: Pollution and protection, vulnerability and risk of groundwater systems to external pollution – Natural Hazards and Disasters: Key concepts and definitions, natural disaster management, system vulnerability to natural hazards and risk assessment.
2. Analysis of the concepts of vulnerability, risk, hazard, susceptibility, and exposure.
3. Methods for assessing vulnerability in granular/porous aquifers.
4. Methods for assessing vulnerability in fractured aquifers.
5. Methods for assessing vulnerability in karst aquifers.
6. Floods and the geophysical environment, methods of flood risk assessment.
7. Causes and impacts of floods – Projects, actions, and preventive and preparedness measures for addressing flood events.
8. Drought – Part 1: Basic concepts and definitions – Recent global events – Types, causes, characteristics, and impacts of drought.
9. Drought – Part 2: Quantification of drought – SPI Index – Use of software for SPI calculation.
10. Drought – Part 3: Drought risk assessment.
11. Geohazards – Part 1: Main types, causes, and impacts.
12. Geohazards – Part 2: Mitigation and protection measures.
13. Geohazards – Part 3: Hazard assessment methods.

At the end of the course the students will be able:

- To understand the concepts of groundwater vulnerability and risk, as well as the concept of hazard resulting from natural phenomena.
- To evaluate methods for the protection of water resources and prevention against natural disasters.
- To identify various types of aquifers and apply appropriate methods for assessing their vulnerability to external pollution.
- To analyze the causes of flood events, assess their impacts, and propose measures for reducing flood risk and mitigating their consequences.
- To recognize the main types of droughts, analyze the factors that cause them, examine the impacts of drought in various sectors, and utilize methods and tools to quantify drought.
- To comprehend the process and parameters required for assessing the risk associated with both floods and droughts.
- To identify major geological hazards and their dependence on water, understand their impacts, and be familiar with protection and mitigation measures.
- To evaluate methods for assessing geohazard risk.
- To develop and present a topic related to the protection of water resources and/or the prevention from natural disasters.

Teaching Mode: 3 Hours Suggestion-Workshop / Week

13 RENEWABLE ENERGY: EXPLOITATION OF HYDRODYNAMIC AND MARINE ENERGY

Teachers: Chrysanthou V., Emeritus Professor
Lalikidou S., PhD Candidate

The course covers the following topics:

1. Technical works for capturing, abducting and abducting water
2. Characteristics and types of reservoirs
3. Flood containment and water storage reservoirs design and dimensioning
4. Technical security projects - Dimensions of security launcher and floor evacuation
5. Topics (homework) on the design and dimensioning of reservoirs
6. Application of optimization methods to reservoir management
7. Regeneration tower: water level oscillation equations, hydraulic shock, unstable flow within closed conductors
8. Drop duct: pipe diameter selectors, static investigation of the duct supports
9. Spiral shell: specifying spiral shell rays
10. Hydroturbines: hydroturbine classes, action hydroturbine function, reaction hydroturbine function
11. Hydroturbine output conductor: output conductor configuration, cavitation
12. Marine wave motion, energy and power
13. Provisions for the generation of electricity through wave energy. Tidal wave power, tidal range power. Provisions for the generation of electricity through the tides. Numerical examples.

At the end of the course the student is competent:

· To possess knowledge for the design and dimensioning of flood containment and water storage reservoirs, as well as for the dimensioning of the safety drawer and the floor evacuator.
· Understand the parameters for the design and dimensioning of the regeneration tower and to study the propagation of the hydraulic shock.
· Apply the knowledge for the design, dimensioning and static investigation of the fall duct.
· Combine the knowledge for the design and dimensioning of the spiral shell.
· Evaluate knowledge on the selection of the type of water turbine.
· To evaluate the knowledge on the design and dimensioning of the outlet pipeline of the water turbine taking into account the phenomenon of cavitation.
· Possess theoretical knowledge of motion, energy and sea-wave power in order to understand how the relevant power generators operate.
· Possess theoretical knowledge of tidal current and tidal range power in order to understand how the relevant power generators are operated.

Teaching Mode: 3 hours suggestion-exercises / week

14 GEOSYNTHETICS IN HYDRAULIC AND ENVIRONMENTAL ENGINEERING

Teachers: Markou I., Professor

The course covers the following topics:

1. Introduction – Types and functions of geosynthetics
2. Properties of geosynthetics
3. Drainage applications
4. Filtration applications
5. Slope erosion control
6. Landfills – Part 1
7. Landfills – Part 2
8. Embankments
9. Dams
10. Ponds, reservoirs and canals
11. Specialized applications of geosynthetics – Part 1
12. Specialized applications of geosynthetics – Part 2
13. Examples of hydraulic and environmental projects

At the end of the course the student will be able to understand per type of hydraulic and environmental projects:

• the types of geosynthetics used (geotextiles, geogrids, geomembranes, geonets, geosynthetic clay liners, geocells, geocomposites, etc.)
• the objectives and functions that geosynthetics are required to perform (barrier, separation, filtration, drainage, erosion control, protection, reinforcement)
• the required properties of geosynthetic materials
• the design methodologies applied, and
• the construction methods followed.

Additionally, the student will be able to understand the economic and environmental benefits, as well as the sustainability of the solutions resulting from the use of geosynthetics in hydraulic and environmental engineering

Teaching Mode: 3 Hours Suggestion-Workshop / Week

15 POLLUTION AND PROTECTION OF GROUNDWATER RESOURCES

Teachers: Siarkos I., Asst Professor
Adamidis A., PhD in Civil Engineering

The course covers the following topics:

1. Groundwater and aquifer systems – The threat of groundwater pollution – Pollution sources and types of pollutants – The importance of protecting groundwater resources against pollution.
2. Groundwater quality characteristics – Physical, chemical, and biochemical properties – Physico-chemical processes and their impact on groundwater pollution.
3. Groundwater sampling methods and techniques – Chemical analysis of groundwater – Methods for processing, analyzing, presenting and interpreting the results of hydrochemical analyses.
4. Pollutant transport in groundwater – Mechanisms of pollutant transport (advection, hydrodynamic dispersion, adsorption, degradation, etc.) and their effects – The mathematical formulation of pollutant transport – Analytical and numerical solution methods.
5. Examples of analytical methods for solving pollutant transport problems.
6. Numerical models for simulating pollutant transport – 1 (Basic features, necessary data, and the process of formulating pollutant transport models).
7. Numerical models for simulating pollutant transport – 2 (Use of an interactive tool for simulating pollutant transport).
8. Numerical models for simulating pollutant transport – 3 (Demonstration of pollutant transport simulation software).
9. Groundwater pollution phenomena – 1 (Classification of pollution phenomena from various activities and their risk level – Specialized analysis of various types of pollution).
10. Groundwater pollution phenomena – 2 (The problem of groundwater nitrate contamination: Theoretical approach).
11. Groundwater pollution phenomena – 3 (The problem of groundwater nitrate contamination: Numerical simulation).
12. Protection of groundwater against pollution – Aquifer vulnerability – Protection of abstraction wells (Wellhead Protection Zones, WPZs) – Control and mitigation of pollution sources.
13. Pollution containment and groundwater aquifer restoration – Pump-and-treat systems – Modern remediation methods and alternative techniques.

At the end of the course, the students will be able:

- To identify and categorize the various types of pollutants in groundwater, and assess the level of pollution using appropriate monitoring parameters.
- To understand the necessary procedures for conducting water sampling and hydrochemical analyses, as well as process, present and interpret the results of the analyses.
- To understand the mechanisms that govern the transport of pollutants in groundwater, as well as the significance and role of physico-chemical parameters and processes.
- To apply analytical solutions to solve mass transport problems.
- To use numerical models and specialized software packages to simulate pollutant transport in groundwater.
- To study and analyze pollution phenomena of anthropogenic origin, which are characteristic of groundwater systems.
- To understand the problem of groundwater nitrate contamination and apply theoretical and practical knowledge to study and confront it.
- To design and develop scenarios to mitigate the qualitative degradation of groundwater and propose protection measures against various forms of pollution.
- To implement methods and techniques for the remediation of aquifers, tailored to different categories of pollutants and aquifer systems.

Teaching Mode: 3 hours suggestion-exercises / week

LEARNING OUTCOMES

ΔΗΜΟΚΡΙΤΕΙΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΡΑΚΗΣ | DEMOCRITUS UNIVERSITY OF THRACE

The learning outcomes of the Master Program "Hydraulic Engineering and Environment" are per Specialization the following:

The Specialization "*Hydraulic Structures and Environment"* aims to specialize students in the design, study, construction, maintenance and repair of Hydraulic Works with a strong environmental character. More specifically, after the completion of their studies the graduate students will be able to:

- They are aware of the production of independent and original scientific research on Hydraulic Engineering and the environment.
- They understand the interaction of hydraulic works with the environment as a result of the basic design parameters.
- They understand the physical, chemical and biochemical processes of water systems and describe how to restore them.
- They apply the knowledge gained in the design, dimensioning and calculation of hydraulic works, such as water supply, sewerage, water treatment, liquid and solid waste, sludge, industrial wastewater, waste water disposal to receiving water, environmental technology, etc.
- They analyze the hydraulic works in the individual components, relate them to the various charges, and clarify their effect.
- They compose and design the structure of hydraulic works, choosing the most appropriate way of mathematical modeling and aiming at the best technical, economic and environmental result.
- They shall assess the impact of hydraulic works on the environment and decide to redesign them, defending as far as possible the reduction of adverse environmental effects.

The Specialization "*Water Resources and Natural Disasters Management"* aims at the specialization of students in the design, study, construction, maintenance and repair of Water Projects, related to water resource management, the hydrology of surface and underground waters, land reclamation, hydrodynamic, flood protection projects, mild forms of energy, natural disaster management. More specifically, after the completion of their studies the graduate students will be able to:

- They are aware of the production of independent and original scientific research on the issues of Water Resources and Natural Disasters.
- They understand the harmonious relationship between water resources, centers of consumption and the environment with a view to sustainable development.
- They understand the management of groundwater, the issues of utilization of geothermal energy and in general mild forms (hydrodynamics, wind, marine).
- They apply the knowledge gained in the design, dimensioning and calculation of hydraulic and other projects, with the aim of meeting water demand as far as possible, protecting water resources and the environment, and protecting against extreme hydrometeorological phenomena and natural disasters.

- They analyze the levels of complexity in managing water resources.
- They classify the alternatives and set the appropriate criteria for their evaluation.
- They compose the structure of solutions based on feasibility (technology, means, local technical conditions), but also social, economic and environmental considerations.
- They evaluate alternative solutions to projects, development programs and management policies, using multi-criteria methods.

The Specialization "*Maritime Engineering and Environment*" aims at the qualification of students in the design, study, construction, maintenance and repair of port projects, coastal protection and management projects of the coastal zone, static and dynamic analysis of marine structures, the management and configuration of land area of ports and marinas. More specifically, after their completion students will be able to:

- They are aware of the production of independent and original scientific research on marine projects and the environment.
- They understand the coastal natural processes, the natural oceanography, as well as the marine ecosystem.
- They shall apply the knowledge gained in the design, dimensioning and calculation of coastal protection and coastal zone management projects, port projects, marine structures, port and marinas land development projects.
- They analyze levels of complexity in the design and management of port and coastal projects.
- They classify the alternatives and set the appropriate criteria for their evaluation.
- They compose the structure of solutions based on feasibility (technology, means, local technical conditions), but also social, economic and environmental considerations.
- They shall assess the environmental impact of the projects planned using a research methodology and simulation using numerical methods.

USEFUL HYPERLINKS

Master Program: HYDRAULIC ENGINEERING AND ENVIRONMENT
https://pms.civil.duth.gr/hee/

Master Program: HYDROMETEOROLOGICAL DISASTERS MANAGEMENT
https://pms.civil.duth.gr/hmd/

Master Program: APPLIED MATHEMATICS
https://pms.civil.duth.gr/am/

Quality Policy and Regulations: https://pms.civil.duth.gr/hee/regulations/

- Quality Policy
- Internal Operating Regulations
- Regulations for the Complaint and Objection Management Mechanism
- Academic Advisor Regulations
- Research Ethics Code
- Other Regulations
- Compliance with the General Data Protection Regulation (GDPR)

Regulations of the Department of Civil Engineering, D.U.T.H.: https://civil.duth.gr/

- Doctoral / Post-doctoral Regulations
- Internship Regulations
- Health and Safety Policy
- Personal Data Policy
- Erasmus Mobility Regulations
- Academic Advisor Regulations
- Guide Against Plagiarism