Department of Naval Architect Engineers - Technological Educational Institution of Athens

Lifelong Education, Research and Consulting Services in Naval Architecture and Marine Engineering

INTRODUCTION

The department of Naval Architect Engineers of TEI Athens (www.na.teiath.gr) offers comprehensive knowledge, capabilities and specialization of the highest level, absolutely harmonized with the latest progress of science and art in Naval Architecture and Marine Engineering disciplines, using modern facilities, globally citied scientific staff and experienced technical personnel. The graduates of the department meet the continuously increasing technical demands of shipping sector and as a result are highly absorbed by the local and international markets.

Department knowledge field area

The studies in the department of Naval Architect Engineers cover the modern naval architecture and marine engineering technology, including design and manufacturing methodologies for ships and other marine constructions.

Department Mission

The mission of the Naval Architect Engineers department is the dissemination of scientific knowledge and applications. Delivering teaching, facilitating learning of the highest quality and conducting applied research, the Department of Naval Architect Engineers provides the students with a place where they congregate with academics and are supported by professional support staff, buildings and equipment, to engage in the creation and dissemination of knowledge, the facilitation of learning and the inculcation of skills.

Graduates Profile

During their studies, graduates of the department acquire the scientific and technological knowledge and skills in Naval Architecture and Marine Engineering, that enables them to successfully offer their services in the shipbuilding and shipping industries and at key positions in Governmental Authorities, Regulatory Bodies, European and National Agencies and Classification Societies.

International Presence

The scientific staff of the department participates in research projects funded by the European Commission. Recently, the Department participated in the Bilateral cooperation in research & technology between Greece and China 2012-14, NSRF 2012-2014 via the research program LNGCOMSHIP.

Additionally in the framework of the research program ERASMUS+ the Department has signed bilateral agreement with the Strathclyde University in UK and the Polytechnic of Genova in Italy.

Research and Consulting Services Laboratory

In the facilities of the department operates the research laboratory of Naval Architecture and Marine Engineering, offering a wide range of research and consulting services http://name.stef.teiath.gr/index_en.html.

Floating Structures

A special course and a number of projects and diploma theses deal with the special requirements of oil and gas exploitation floating structures, including and not limited to platforms, oil rigs, submerged pipelines and risers.

Marine Engineering

A variety of courses is offered fully covering the scientific areas of Diesel and Gas Engines, Automation, Sensors, Electrical Installation, Auxiliaries, tanks, shafting and propellers.

Naval Architecture

Ship Design, CAD/CAM, Local and Longitudinal Ship Strength, Hydrodynamics, Hydrostatics and ship constructions are some of the courses offered in undergraduate studies program.

Undergraduate and Postgraduate Studies

The department of Naval Architect Engineers offers undergraduate and lifelong studies, whereas an advanced postgraduate program is currently under development and will be released in September 2017.

The Undergraduate program is a full time 4 years BEng, offering 44 courses and 240 ECTS. The Postgraduate program is a part-time 1,5 years MSc, offering 11 courses and 90 ECTS.

The undergraduate degree aims to develop engineers capable of dealing with engineering challenges observed on a wide range of marine vehicles, with additional skills and comprehensive understanding of the ship design, construction, repair, operation and maintenance.

The postgraduate course aims to further specialize professional engineers on advanced technologies in Naval Architecture and Marine Engineering in order to meet the steeply increasing requirements of modern shipping companies, classification societies, engine builders and shipyards.

Assessment

The main method of assessment is exams in February, June and September.
Presentations, laboratory reports and other forms of coursework are submitted and assessed individually throughout the year.

Each teaching year has two semesters of 13 weeks (minimum), which include formal lectures, tutorials, laboratory and coursework assignments, industrial visits, class tests, additional tutorials and/or project presentations. This is followed by revision classes, private study and exams.

Most assignments involve associated tutorials for guidance. Group exercises, including presentations and peer assessment, are an important part of student's development.

Learning & teaching

The main methods of teaching are lectures, tutorials, laboratory and group design classes. Students should supplement this with self-study. Self-study is important as it develops the confidence to tackle unfamiliar problems. This is an essential skill for professional engineers.

Throughout the course, field visits and 6 months practical training will give to the students first-hand experience of industrial activities in the marine sector.

Laboratory work

This is introduced from the beginning with sessions covering basic aspects of strength of materials, manufacturing processes, fluid mechanics, ship theory (CASD, hydrostatics, stability, powering) and marine engineering.

In second-year, students take part in the design and build of small engineering elements. This combines the use of

professional machinery and hull design software for ships,

An intensive laboratory-based class in third year involves more formal experimental testing, in which students carry out a number of hydrodynamics, dynamics and marine engineering experimental projects. Special efficiency, emissions and vibration tests are performed on a prototype marine diesel engine installed on a "state of the art" test rig of the department.

Fourth-year students have the opportunity to carry out a laboratory based individual project.

Computer software

This is used to demonstrate the practical application of theory and also expose students to current engineering practice.

The use of professional software to solve real engineering problems is introduced in first year and is reinforced throughout subsequent years. Students will gain exposure to software packages for stability, dynamics and simulation, FEA, hydrodynamics, risk-based design as well as other more specialised software packages.

Guest lectures

During term time, we arrange weekly seminars in which leaders and pioneers of the maritime, oil and gas and marine renewables industries visit the department and present to students. This is a great way of supplementing student's education with the latest developments and gaining industry contacts for their future career.

Courses

1st SEMESTER
Mathematical Analysis I
Physics I
Mechanics I
Chemical Technology
Mechanical Eng Drawing & Introduction to MCAD
Computer Programming

2nd SEMESTER
Mathematical Analysis II
Physics II
Mechanics II (Strength of materials)
Ship lines Drawing & Introduction to CASD
Manufacturing Processes

3rd SEMESTER
Numerical Analysis
Machine Elements
Fluid Mechanics I
Traditional Ship Design
Ship Welding Technology
Shipbuilding Materials Technology

4th SEMESTER
Fluid Mechanics II
Thermodynamics
Ship Electrical Systems
Ship Theory I
Business Administration
Technical English

5th SEMESTER
Marine Engines
Ship Theory II
Computer Applications to Ship Design I
Ship Strength I
Small Craft Technology

6th SEMESTER
Marine Engineering
-Ship Piping Systems and Auxiliary Machinery
Ship Design & Outfitting I
Ship Strength II
Ship Construction
Selective Course (Group A)
Selective Course (Group B)

Selective Courses of 6th Semester
Group A
Reliability of Marine Structures
& Total Quality Management
Ship Automation
Group B
Ship Repairs, Modifications and Surveys
Shipyard Systems, Shipping Companies
& Classification Societies (educational visits)

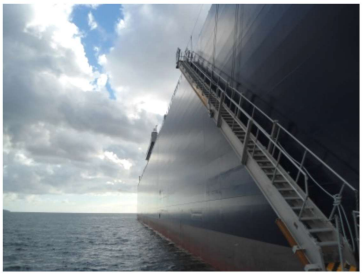
7th SEMESTER
Technical Law
Maritime Economics
Computer Applications to Ship Design II
Financial & Technical Analysis
Selective Course (Group A)
Selective Course (Group B)

Selective Courses of 7th Semester
Group A
Environmental Protection& Safety Issues

Knowledge Production & Technology Transfer

Group B
Ship Design& Outfitting II
Special Marine Constructions & Sailing Vessels

8th SEMESTER
6 Months Practical Training
Degree Thesis



Focus on Engineering Challenges

This degree aims to develop engineers capable of dealing with engineering challenges observed on a wide range of marine vehicles

Experimental Projects

An intensive laboratory-based class in third year involves more formal experimental testing, in which students carry out a number of hydrodynamics, dynamics and marine engineering experimental projects

Automation and Electrical Systems

Two courses and several experimental projects are dedicated to "state of the art" technology of marine automation and electrical Systems.

HIGHLIGHTS

Focus on Market

The continuously expanding fleet size in conjunction with its modernization makes imperative the employment of engineers, operators and managers with advanced and updated engineering knowledge and specialization

Qualify and NOT OVER-qualify

The offered lifelong education course aims to qualify properly the stakeholders to meet the steeply increasing requirements and challenges of expanding shipping sector.

FAST FACTS

700

Shipping companies are active in Greece

4700

Ships are managed by Greek owned shipping companies

FOR MORE INFORMATION

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Greek shipping companies constitute a key pillar of the Greek Economy, employing several Greek engineers and scientists

Lifelong Education Course on "Advanced Technical Issues on Ship's Operation and Maintenance"

by Georgios Livanos

The objective of the offered Lifelong educational course is to update and upgrade the engineering knowledge level of participants who have completed their undergraduate and/or post graduate studies and are already working or are interested to be hired in modern shipping companies worldwide.

Target Group

- Naval Architects
- Marine Engineers
- Mechanical Engineers
- Electrical and Automation Engineers
- Fleet Managers and Superintendent Engineers
- Operators

Course Learning Results

Following the successful course completion, the trainee will:

- Obtain the upgraded knowledge foundation concerning calculations and technical requirements, as defined in international rules, guidelines and standards and applied in modern shipbuilding and fleet O&M.
- Recognize and comprehensively understand the special requirements of each marine engineering and naval architecture application, depending on the type and its operational profile AND implement the relevant rules, codes, processes and recommendations for the design, construction, operation and maintenance of ships and fleets.
- Conduct the needed advanced calculations, monitoring processes, supervise constructions and apply class rules and technical recommendations

Shipping Market Driven Course

Greek shipping companies constitute a key pillar of the Greek Economy, employing several Greek engineers and scientists in the branch of Operation and Maintenance of existing Greek owned fleets, as well as in the branch of new buildings in shipyards around the globe. It is to be highlighted that in Greece are based more than 700 shipping companies, managing more than 4700 ships of total tonnage of 303.5 million tones DWT. It is also noticeable that the average age of the Greek owned fleet decreased significantly the recent years, evidently proving the trust of the ship-owners to new marine technologies and environmental friendly ships. The continuously expanding fleet size in conjunction with its modernization makes imperative the employment of engineers, operators and managers with advanced and updated engineering knowledge and specialization. Considering that today the majority of Greek Shipping companies employ a wide range of

engineers with different undergraduate studies (mechanical engineers, marine engineers, naval architects, electrical engineers, automation experts etc), the significance of the offered lifelong education course of the Technological Educational Institution of Athens is obvious, since aims to qualify properly the stakeholders to meet the steeply increasing requirements and challenges of expanding shipping sector.

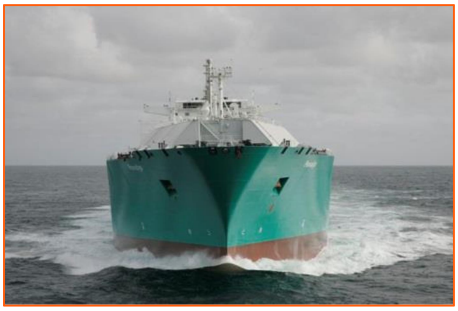
Course Outline

- Ship Hydraulics and Pipelines (9 hours)
- Propulsion Plants and Auxiliary systems (8 hours)
- Hydrostatics and Ship Stability (8 hours)
- Ship Resistance and Propulsion (4 hours)
- Weldings and Non Destructive Tests (NDT) (5 hours)
- Repairs and Maintenance of Ship Construction (8 hours)

Course key characteristics

- 42 hours course
- Groups of 10 trainees
- All instructors are experienced full time professors with long market experience.
- Full time or part time option
- Upon request the course can be performed on customer's premises (min. 10 attendees)
- 700 pages printed material will be distributed.
- Theory and Exercises included
- Design in collaboration with several shipping companies for meeting their needs
- Course fine tuning possible for servicing customer needs

Research and Consulting Laboratory



Strategic Goals

The strategic goals of the Department of Naval Architect Engineers of the Faculty of Technological Applications of the Technological Educational Institution of Athens (TEI Athens), in the framework of its mission and vision, are rigidly aligned in the continuation of its long successful tradition, whereas aspires to stand out in Research and concrete undergraduate, post-graduate and lifelong education of young Naval Architect Engineers. In detail, the Department of Naval Architect Engineers of TEI of Athens constitutes the only department in the Higher Technological Educational Institutions in Greece offering undergraduate (very soon post graduate) and lifelong technological education in the scientific area of Naval Architecture and Marine Engineering. It aims to spread scientific knowledge and its applications to modern Naval Architecture technology, including and not limited to design, study, construction and the relevant methologies both for ships and marine floating structures generally.

The Department of Naval Architect Engineers of TEI Athens participates in several Research projects either as independent research provider or in cooperation with Universities and other stakeholders.

The sectors where extensive research was performed in the last years include the disciplines of Marine Engineering, Ship Hydrodynamics and Ship Strength. In detail the last years the scientific personnel of the department participated in the following research projects:

- E-greenship: 300.000,00 € total budget
- Lngcomship: 700.000,00 € total budget
- EXCITING: 150.000,00 € budget for TEI
- HYDELFS, Research Program ARCHIMEDES, Coordinator TEI of Athens, 2012-2015
- BIOPROSHIP, Research Program ARISTEIA, Collaboration with NTUA, 2013-2015
- GEOMCOMP, Research Program THALES, Collaboration with NTUA, UOA, 2012-2015

Also, the scientific staff of the department performs high-level research published in scientific journals and conferences proceedings.

Laboratory Overview

The Research and Consulting laboratory of Naval Architecture and Marine Engineering services the educational and applied research market needs in the following disciplines

- Ship Design: Optimization Procedures, Geometric – Parametric Ship Design, Intact and Damaged Stability, High Speed Vessels Design.
- Marine Hydrodynamics: Body – waves interactions, Dynamic Responses and loading of Ships and Floating Structures on waves, Flow – Construction Interactions, Ship Resistance, Computational Fluid Dynamics, Free surface waves in an environment of varying parameters, Energy from waves.
- Strength of Ships and Floating structures: local and longitudinal ship strength, Analytical Solutions, Finite Element Methods.
- Marine Engineering: Liquefied Natural Gas Applications on Ships, Marine Diesel and Gas Engines Modelling, Optimization of Ship's Energy Systems, Improvement of Ship's Energy footprint, Main Engine – Propeller Interactions, Development of Sensor Configurations and automated measurement layouts with application in Marine Engineering, Marine Engine's Lubrication and Tribology, Primary and Secondary Methods of Emission's Reduction, Noise attenuation analysis, Shafting Design, Vibration Analysis, Measurements and Troubleshooting.
- Computational Methods and CFD

Offered Services

- Ship hull and appendages optimization
- Advanced ship evacuation analysis. Arrangement of ship internal layouts.

- Numerical tools for the assessment of flow-structure interactions. Wave loading stress calculation.
- Assessment of ship energy requirements and upgrades.
- Specific fuel consumption and tailpipe emissions measurements for main and auxiliary marine engines.
- Measurements of torsional vibrations, torque and thrust in ship propulsion systems.
- Noise and vibration measurements.
- Marine accidents investigation.
- Algorithms for complex-systems simulation based on parallel and hybrid architectures in multi-processing environments.

The Research and Consulting Laboratory of Naval Architecture and Marine Engineering contributes to the increased competitiveness of the Greek and European industry by providing unique and innovative solutions to research problems of technological and/or commercial interest.

AREAS OF INTEREST

Marine Engineering

Shafting Design, Vibration Analysis, Measurements and Troubleshooting are some of the Services Offered to Public and Private Sector Companies.

Ship Design

Optimization Procedures, Geometric – Parametric Ship Design, Intact and Damaged Stability, High Speed Vessels Design are some of the research topics of the laboratory.

Strength of Ships and Floating Constructions

Local and longitudinal ship strength problems are solved using advanced analytical tools, as well as Finite Element Methods. A full set of consulting service is available including studies, measurements and reporting.

FAST FACTS FOR TEI OF ATHENS

Technological Educational Institutions (TEI' s) are legal entities, which were founded in 1983 within the framework of Law 1404/1983 in order to bridge the gap between the theoretical knowledge and background provided by the Greek universities and the demand for highly trained staff who could meet the challenges of the Greek market in technology related fields.

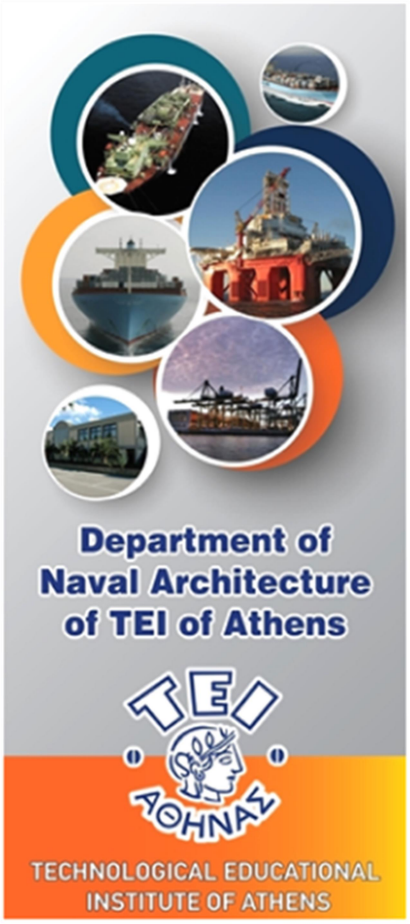
They are self-governed, multi-disciplinary, technology-oriented institutions funded by the Greek Ministry of Education and Religious Affairs and according to Law 3549/2007 TEI' s are equal to the Greek universities.

The TEI of Athens is the largest of all TEI' s in Greece situated at Aegaleo, a densely populated suburb of Athens. It has always been at the forefront of developments in technological education.

Over 35.000 students attend the four-year courses provided by its Departments and taught by teaching staff committed to maintaining the highest standards in education.

Great emphasis is laid on the curricula of the Departments which are continuously revised in order to keep pace with all the recent developments in technology and to be tailored to the needs of the Greek market.

It comprises five faculties which occupy a complex of buildings on the main campus, though several Departments are situated elsewhere due to the increasing number of students



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