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# MASTER OF SCIENCE, TECHNOLOGY AND HEALTH

2022-2023

YEAR 2

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## MARINE TECHNOLOGY

ATLANTIC MASTER ON SHIP OPERATION  
AND NAVAL ENGINEERING (AMASONE)

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PROGRAMME SUPERVISOR(S):

Antoine DUCOIN



## Marine Technology - Atlantic Master on Ship Operation and Naval Engineering (AMASONE)

# YEAR 2 - Autumn Semester

### CORE COURSES

| Course code | Title                                     | ECTS Credits |
|-------------|---|--------------|
| CONF        | Conferences                               | -            |
| HYDRA       | Hydrodynamics (advanced)                  | 6            |
| LABHY       | Labs in Hydrodynamics & Propulsion System | 6            |
| MANAK       | Maritime & Navigation Knowledge           | 6            |
| PROJT       | Project                                   | -            |
| THEMA       | Thermal Machines                          | 6            |
| TROSH       | Training on Ship                          | 4            |

### LANGUAGE COURSES

| Course code | Title                              | ECTS Credits |
|-------------|------------------------------------|--------------|
| CCE3        | Cultural and Communication English | 2            |
| ESP3        | Spanish Language                   | 2            |
| FLE3        | French Language                    | 2            |

# YEAR 2 - Spring Semester

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## CORE COURSES

| Course code | Title                       | ECTS Credits |
|-------------|-----------------------------|--------------|
| THESIS      | Internship / Thesis project | 30           |

# Master Programme - Marine Technology - Atlantic Master on Ship Operation and Naval Engineering (AMASONE)

YEAR 2 - Autumn Semester

## Conferences [CONF]

*LEAD PROFESSOR(S): Antoine DUCOIN*

### Objectives

This course is devoted to general conferences that may be given during the year.

### Course contents

### Course material

### Assessment

Individual assessment: EVI 1 (coefficient 1.0)

| LANGUAGE OF INSTRUCTION | ECTS CREDITS | LECTURES | TUTORIALS | LAB   | PROJECT | EXAM  |
|-------------------------|--------------|----------|-----------|-------|---------|-------|
| English                 | -            | 20 hrs   | 0 hrs     | 0 hrs | 0 hrs   | 0 hrs |

# Master Programme - Marine Technology - Atlantic Master on Ship Operation and Naval Engineering (AMASONE)

YEAR 2 - Autumn Semester

## Hydrodynamics (advanced) [HYDRA]

*LEAD PROFESSOR(S): Antoine DUCOIN*

### Objectives

To give knowledge in advances hydrodynamics

### Course contents

Description of the ship design process

Design of a ship using a naval architecture software

Study of international regulations

Study of the propulsion system

During this two-week internship the student puts into practice the teachings received during the beginning of training. The work is carried out by two or three students who develop the preliminary design of a service vessel meeting the criteria imposed by international regulations.

### Course material

### Assessment

Individual assessment: EVI 1 (coefficient 1.0)

| LANGUAGE OF INSTRUCTION | ECTS CREDITS | LECTURES | TUTORIALS | LAB   | PROJECT | EXAM  |
|-------------------------|--------------|----------|-----------|-------|---------|-------|
| English                 | 6            | 30 hrs   | 0 hrs     | 0 hrs | 0 hrs   | 0 hrs |

# Master Programme - Marine Technology - Atlantic Master on Ship Operation and Naval Engineering (AMASONE)

YEAR 2 - Autumn Semester

## Labs in Hydrodynamics & Propulsion System [LABHY]

LEAD PROFESSOR(S): Antoine DUCOIN

### Objectives

To provide students with state-of-the-art knowledge on experimental fluid dynamics in the field of Offshore renewable energy and propulsion systems. Despite the development of numerical modelling, the experimental approach remains a major source of knowledge development in ship hydrodynamics and marine renewable energy. The contribution to the selection of adequate hypotheses and to the validation of analytical or numerical models is of primary importance. In numerous situations, the experimental approach remains the most reliable, economical and fastest way to validate new designs. Specific instrumentation and facilities are presented in this course and used in lab work.

### Course contents

Programme:

Lesson 1 - Introduction to experimental hydrodynamics. The students find the main topics in MRE experiments.

Lesson 2 - Experimental ocean engineering. Experimental tests in offshore basins.

Lesson 3 - Resistance. Ship resistance and experiments in towing tanks. Reynolds and Froude similitude; extrapolation at full scale.

Lesson 4 - Ship manoeuvrability. Mathematical formulation, experimental determination of hydrodynamic coefficients. Modelling of towed structures.

Lesson 5 - Measurements and signal processing. Sensors and transducers, sampling theory. Signal processing, Fourier analysis.

### Course material

- S.A. Hughes, Physical Models and Laboratory Techniques in Coastal Engineering
- N. Newman, Marine Hydrodynamics
- O.M. Faltinsen, Sea loads on ships and offshore structures
- V. Bertram, Practical Hydrodynamics
- S. Chakrabarti, Offshore structure modelling

### Assessment

Individual assessment: EVI 1 (coefficient 1.0)

| LANGUAGE OF INSTRUCTION | ECTS CREDITS | LECTURES | TUTORIALS | LAB    | PROJECT | EXAM  |
|-------------------------|--------------|----------|-----------|--------|---------|-------|
| English                 | 6            | 0 hrs    | 0 hrs     | 40 hrs | 0 hrs   | 0 hrs |

# Master Programme - Marine Technology - Atlantic Master on Ship Operation and Naval Engineering (AMASONE)

YEAR 2 - Autumn Semester

## Maritime & Navigation Knowledge [MANAK]

*LEAD PROFESSOR(S): Antoine DUCOIN*

### Objectives

- To understand ship operations
- To understand merchant marine specificities
- To understand global maritime distress and safety system
- To understand maritime security rules

### Course contents

- Presentation of ship specificities, ship-handling, organization.
- Navigation basic knowledge
- Maritime English (Merchant marine)
- Basic safety communication (GMDSS)
- Safety and security codes

### Course material

- Ship handling book par H. Baudu (Ed. Dokmar)
- Le dictionnaire maritime thématique anglais et français (Ed. Presse Masson)
- IAMSAR Manual (Ed. IMO)
- ISM and ISPS Code (Ed. IMO)
- ALRS vol 5 (UKHO)

### Assessment

Individual assessment: EVI 1 (coefficient 1.0)

| LANGUAGE OF INSTRUCTION | ECTS CREDITS | LECTURES | TUTORIALS | LAB   | PROJECT | EXAM  |
|-------------------------|--------------|----------|-----------|-------|---------|-------|
| English                 | 6            | 60 hrs   | 0 hrs     | 0 hrs | 0 hrs   | 0 hrs |

# Master Programme - Marine Technology - Atlantic Master on Ship Operation and Naval Engineering (AMASONE)

YEAR 2 - Autumn Semester

## Project [PROJT]

*LEAD PROFESSOR(S): Antoine DUCOIN*

### Objectives

AMASONE PROJECT

### Course contents

AMASONE PROJECT

### Course material

### Assessment

Individual assessment: EVI 1 (coefficient 1.0)

| LANGUAGE OF INSTRUCTION | ECTS CREDITS | LECTURES | TUTORIALS | LAB   | PROJECT | EXAM  |
|-------------------------|--------------|----------|-----------|-------|---------|-------|
| English                 | -            | 0 hrs    | 0 hrs     | 0 hrs | 64 hrs  | 0 hrs |



# Master Programme - Marine Technology - Atlantic Master on Ship Operation and Naval Engineering (AMASONE)

YEAR 2 - Autumn Semester

## Thermal Machines [THEMA]

*LEAD PROFESSOR(S): Antoine DUCOIN*

### Objectives

The objective of this course is to introduce the specificity of naval propulsion devices.

### Course contents

The first part of the course presents a list of different systems dedicated to naval propulsion (sail, internal combustion engine, nuclear) and their application depending on the ship type.

There will be a focus on marine diesel engines and their application in the naval field.

The second part of the course presents the power transmission on a ship and different types of propulsion devices (wheels, propellers, hydrojets etc). This part concludes with practical applications and a visit by a marine diesel manufacturer.

### Course material

Ship Resistance and Propulsion: Practical Estimation of Propulsive Power (Google Digital book)

Anthony F. Molland, Stephen R. Turnock, Dominic A. Hudson Cambridge University Press, 8 August 2011

### Assessment

Individual assessment: EVI 1 (coefficient 1.0)

| LANGUAGE OF INSTRUCTION | ECTS CREDITS | LECTURES | TUTORIALS | LAB   | PROJECT | EXAM  |
|-------------------------|--------------|----------|-----------|-------|---------|-------|
| English                 | 6            | 30 hrs   | 0 hrs     | 0 hrs | 0 hrs   | 2 hrs |

# Master Programme - Marine Technology - Atlantic Master on Ship Operation and Naval Engineering (AMASONE)

YEAR 2 - Autumn Semester

## Training on Ship [TROSH]

*LEAD PROFESSOR(S): Antoine DUCOIN*

### Objectives

To develop security, navigation and maneuver fundamentals.  
To enhance seamanship through maneuver practice at sea and navigation at sea

### Course contents

- Basic security training.
- Navigation training on bridge simulator.
- Basic maneuver training at sea (rhib, motor boats).
- Navigation aboard French Navy training units

- Navigation Simulator : CC Loïc Moller
- Security : LV Emilie Guiho
- Personal Rescue Techniques : LV Sylvain Frappier
- Training on "Zodiac" : CC Patrice L'Hour
- Training on Ship : CC L'Hour with other officers

### Course material

Code Vagnon permis de plaisance par A. Nemeta (Ed. Vagnon)  
 Traité Vagnon de navigation par C. Lorieux (Ed. Vagnon)  
 Guide de manœuvre de l'Ecole navale (impr. Ecole navale)  
 Traité de manœuvre par Hervé Baudu (Ed. InfoMer)

### Assessment

Individual assessment: EVI 1 (coefficient 1.0)

| LANGUAGE OF INSTRUCTION | ECTS CREDITS | LECTURES | TUTORIALS | LAB   | PROJECT | EXAM  |
|-------------------------|--------------|----------|-----------|-------|---------|-------|
| English                 | 4            | 40 hrs   | 0 hrs     | 0 hrs | 0 hrs   | 0 hrs |

# Master Programme - Marine Technology - Atlantic Master on Ship Operation and Naval Engineering (AMASONE)

YEAR 2 - Autumn Semester

## Cultural and Communication English [CCE3]

*LEAD PROFESSOR(S): David TROYA*

### Objectives

Team-building and Communicational English:

- Understand the general concepts of team-building
- Build a team-building project
- Understand and nurture the creative process
- Enhance self-belief and self-empowerment

Behavioral skills in an inter-cultural environment:

- Strengthen self-confidence and capacity for interaction
- Develop active listening and reformulation skills
- Develop networking skills

### Course contents

Cultural and Communicational English: exercises to explore in practice the areas of culture and communication  
Field-related or inter-cultural project.

### Course material

Written and televised press, information and digital tools, general documents business environment and company strategies.  
Internet conferences (Ted Talks, etc.), our own educational materials on Hippocampus (Moodle).

### Assessment

Individual assessment: EVI 1 (coefficient 1.0)

| LANGUAGE OF INSTRUCTION | ECTS CREDITS | LECTURES | TUTORIALS | LAB   | PROJECT | EXAM  |
|-------------------------|--------------|----------|-----------|-------|---------|-------|
| English                 | 2            | 0 hrs    | 32 hrs    | 0 hrs | 0 hrs   | 0 hrs |

# Master Programme - Marine Technology - Atlantic Master on Ship Operation and Naval Engineering (AMASONE)

YEAR 2 - Autumn Semester

## Spanish Language [ESP3]

LEAD PROFESSOR(S): Marta HERRERA

### Objectives

For beginners:

Practice and reinforcement of the five skills (oral and written expression and comprehension as well as interaction)

Acquisition of vocabulary and linguistic structures

Be able to talk about yourself and those around you

Be able to express oneself during daily activities

Know how to give your opinion

For advanced students:

Practice and reinforcement of the five skills (oral and written expression and comprehension as well as interaction)

Acquisition of specialised vocabulary

Be able to understand the essential content of concrete or abstract subjects including a technical discussion

Be able to communicate spontaneously and fluently

Be able to express oneself in a clear and detailed manner, to express an opinion on a topical subject

### Course contents

For beginners:

Personal environment (introduce yourself, express yourself, your tastes, your character, your hobbies, etc.), your surroundings (friends, family, location, climate), your interests (sports, leisure)

Present tense (regular and irregular)

Language patterns to express habit, obligation, "gustar" and its equivalents,

Possessive adjectives

Differences between "es", "está", "hay"

Use of "por" and "para"

Adverbs and frequency patterns

Numeral adjectives

For advanced students:

Knowledge of the Hispanic world (economic, technical, cultural and social environment)

Present tense (regular and irregular)

Imperative

Past tenses

Direct / indirect style

Future tense

Conditional tense

Present and past subjunctive moods

### Course material

Preparation manuals, our own tailor-made documents, written and internet press, general civilization documents, digital tools

### Assessment

Individual assessment: EVI 1 (coefficient 1)

| LANGUAGE OF INSTRUCTION | ECTS CREDITS | LECTURES | TUTORIALS | LAB   | PROJECT | EXAM  |
|-------------------------|--------------|----------|-----------|-------|---------|-------|
| English                 | 2            | 0 hrs    | 32 hrs    | 0 hrs | 0 hrs   | 0 hrs |

# Master Programme - Marine Technology - Atlantic Master on Ship Operation and Naval Engineering (AMASONE)

YEAR 2 - Autumn Semester

## French Language [FLE3]

LEAD PROFESSOR(S): *Silvia ERTL*

### Objectives

The objective is to familiarize the learner with the French language and French culture through an entertaining task-based communicative language teaching, focused on speaking combined with:

- Phonetics
- Self-correcting exercises on our learning platform
- Learning Lab activities
- Project work
- Tutoring

Course objectives include the acquisition and reinforcement of vocabulary, syntax, and pronunciation by both traditional means and through the use of digital resources. Students will learn general French, develop language skills of oral and written comprehension and expression.

After completing this course (32 hours + personal work), the students will be able to communicate in spoken and written French, in a simple, but clear manner, on familiar topics in the context of study, hobbies etc. Another important goal of this course is to introduce the student to French culture.

At the end of the course, complete beginners can achieve an A1 level and some aspects of the A2 of The Common European Framework of Reference for Languages. More advanced students may aim for B1/B2 levels. Those who already completed the first year of the French course will be prepared for working in a French business environment.

### Course contents

Two different tracks are proposed: track 1 for students newly arrived at Centrale Nantes and track 2 for students who have completed the first year of the French course. Track 1:

Full range of practical communication language exercises: reading comprehension, listening comprehension, written expression, oral expression.

Learners will be able to use the foreign language in a simple way for the following purposes:

1. Giving and obtaining factual information:

- personal information (e.g. name, address, place of origin, date of birth, education, occupation)
- non-personal information (e.g. about places and how to get there, time of day, various facilities and services, rules and regulations, opening hours, where and what to eat, etc.)

2. Establishing and maintaining social and professional contacts, particularly:

- meeting people and making acquaintances
- extending invitations and reacting to being invited
- proposing/arranging a course of action
- exchanging information, views, feelings, wishes, concerning matters of common interest, particularly those relating to personal life and circumstances, living conditions and environment, educational/occupational activities and interests, leisure activities and social life

3. Carrying out certain transactions:

- making arrangements (planning, tickets, reservations, etc.) for travel, accommodation, appointments, leisure activities
- making purchases
- ordering food and drink

### Track 2:

This track follows on directly from the first-year French course, developing and completing the concepts studied thus far. The main themes are: housing, health and work. These topics will help prepare students for their future work environment. For example, housing is explored in the form of a search for accommodation upon arrival in a new city. Special workshops for CVs and cover letters, elevator pitches and job interviews.

### Course material

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Preparation manuals, our own tailor-made documents, written and televised press, internet, general civilization documents, digital tools, our own educational materials on Hippocampus (Moodle).

### Assessment

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Individual assessment: EVI 1 (coefficient 1.0)

| LANGUAGE OF INSTRUCTION | ECTS CREDITS | LECTURES | TUTORIALS | LAB   | PROJECT | EXAM  |
|-------------------------|--------------|----------|-----------|-------|---------|-------|
| English                 | 2            | 0 hrs    | 32 hrs    | 0 hrs | 0 hrs   | 0 hrs |

# Master Programme - Marine Technology - Atlantic Master on Ship Operation and Naval Engineering (AMASONE)

YEAR 2 - Spring Semester

## Internship / Thesis project [THESIS]

LEAD PROFESSOR(S): Antoine DUCOIN

### Objectives

- Be exposed to and adapt to an industrial or research environment
- Put in practice the scientific and technical skills acquired in the previous semesters
- Strengthen interpersonal and communication skills
- Be part of or manage a project
- Organize tasks, analyze results and build deliverables

### Course contents

Students should be pro-active and career-oriented in the search for their thesis/internship. The topics are validated by the program supervisor to ensure an adequate Master level. The thesis/internship is evaluated through the submission of a written report and an oral defense.

### Course material

- Turabian Kate Larimore, Booth Wayne Clayton, Colomb Gregory G., Williams Joseph M., & University of Chicago press. (2013). A manual for writers of research papers, theses, and dissertations: Chicago style for students and researchers (8th edition.). Chicago (Ill.) London: University of Chicago Press.
- Bui Yvonne N. How to Write a Master's Thesis. 2nd ed. Thousand Oaks, Calif: Sage, 2014.
- Evans David G., Gruba Paul, et Zobel Justin. How to Write a Better Thesis. 3rd edition. Carlton South, Vic: Melbourne University Press, 2011.

### Assessment

Individual assessment: EVI 1 (coefficient 1.0)

| LANGUAGE OF INSTRUCTION | ECTS CREDITS | LECTURES | TUTORIALS | LAB   | PROJECT | EXAM  |
|-------------------------|--------------|----------|-----------|-------|---------|-------|
| English                 | 30           | 0 hrs    | 0 hrs     | 0 hrs | 0 hrs   | 0 hrs |