

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
SESS6004	STRUCTURAL INTEGRITY	
MARINE CRAFT SPECIALISATION		
Prerequisites	Fundamentals of Ship Science, Engineering structures	
Syllabus		
<p><u>AIMS:</u> The aims of this module are to: * Provide a background to advanced topics of interest to maritime structural designers with particular emphasis on the safety and integrity of structures</p> <p><u>CONTENT:</u> * Bending of Plates Large deflection; elastic behaviour; plastic performance; design curves * Safety and Reliability Background to level I, II and III approaches; deterministic approaches; safety index and partial safety factors; design routes * Fatigue and Fracture Basic concepts; representation of fatigue data; cumulative damage models; stress intensity factors; crack propagation laws; residual life and constant life lines</p>		<p>Lectures: 30h</p> <p>Independent learning: 70h</p> <p><u>Assessment:</u> * 2h written examination</p>
TOTAL	ECTS =5	Total workload: 100H

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
SESS6008	YACHT EXPERIMENTAL TECHNIQUES	
MARINE CRAFT SPECIALISATION		
Prerequisites	Fundamentals of Ship Science	
Syllabus		
<p><u>AIMS:</u> The aims of this module are to:</p> <ul style="list-style-type: none"> * provide an insight into the physics of performance prediction methods and their application in physical model testing * provide a broad coverage of the experimental techniques that have been applied to the study of the performance of sailing vessels and small power craft and ships. <p><u>CONTENT:</u></p> <ul style="list-style-type: none"> * Background to resistance and propulsion * Force measurement * Test methods * Laboratory classes * Seakeeping * Wind tunnel test methods * Miscellaneous test techniques * Performance prediction * Information on full scale trials 		<p>Lectures: 29h</p> <p>Independent learning: 71h</p> <p><u>Assessment:</u> * 2h written examination</p>
TOTAL	ECTS =5	Total workload: 100H

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
SESS6006	ADVANCES IN SHIP RESISTANCE AND PROPULSION	
MARINE CRAFT SPECIALISATION		
Prerequisites	Fundamentals of Ship Science	
Syllabus		
<p><u>AIMS:</u> The aims of this module are to:</p> <ul style="list-style-type: none"> * Provide a fundamental understanding of the advances in ship resistance and propulsion through experimental, computational and theoretical techniques <p><u>CONTENT:</u></p> <ul style="list-style-type: none"> * Experimental determination of ship resistance components * Wake * Theroretical prediction of wave resistance and comparisons with experiment; modelling wake * Theoretical approach to propeller design. 		<p>Lectures: 27h</p> <p>Independent learning: 73h</p> <p><u>Assessment:</u></p> <ul style="list-style-type: none"> * 2h written examination *Coursework Assignment
TOTAL	ECTS =5	Total workload: 100H

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
SESS6005	NAVAL ARCHITECTURE DYNAMICS	
MARINE CRAFT SPECIALISATION		
Prerequisites	Fundamentals of Ship Science, Engineering Mechanics	
Syllabus		
<p>AIMS: The aims of this module are to: * Provide a foundation course in the study of ship dynamics. * Provide the basic building blocks that are necessary to establish a firm theoretical framework that allows the student to understand the effects of the sea on ship design.</p> <p>CONTENT:</p> <ol style="list-style-type: none"> 1. Balancing of rigid rotors. 2. Systems with one d.o.f. 3. Systems with two d.o.f. 4. Systems with multiple d.o.f. 5. Discrete systems: Numerical methods for systems with two or more d.o.f. 6. Continuous systems: Axial and torsional and flexural vibrations 7. Regular wave properties. 8. Statistics associated with irregular waves. 9. Deterministic methods for describing standard sea states. 10. Spectral analysis applied to the sea surface. 11. Heave, pitch and roll treated as one d.o.f. 12. Calculation of transfer functions of rigid body modes. 13. Quantification of rigid body modes in a random seaway. 14. Understanding of the measures used for habitability. 15. Methods of model testing. 		<p>Lectures: 27h</p> <p>Independent learning: 73 h</p> <p><u>Assessment:</u> * 3 h Written Examination * Example sheets</p>
TOTAL	ECTS =5	Total workload: 100H

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
SSESS6002	MARINE SAFETY AND ENVIRONMENTAL ENGINEERING	
MARINE CRAFT SPECIALISATION		
Prerequisites		
Syllabus		
<p><u>AIMS:</u> The aims of this module are to: * Acquire a thorough understanding of quantitative risk assessment methods and their use as part of the decision making process in both maritime design and operations. * Appreciate the environmental impact of maritime engineering activities and methods by which the impact can be minimised.</p> <p>* Describe the techniques of analysis for examining the consequences of system failure and for minimising / mitigating effect on environment/personnel/equipment. * Appreciate the importance of active safety management and the increasing need to account for the impact maritime activities on the environment.</p> <p><u>CONTENT:</u> Introduction to Safety, Risk and Reliability Probability and Statistical Theory Risk Analysis II Reliability Structural Reliability Safety: Design and Management Human Factors Ship and Offshore Collisions Hazardous Cargo Environmental Impact of Maritime Activities</p>		<p>Lectures: 27h</p> <p>Independent learning: 73h</p> <p><u>Assessment:</u></p> <p>*2h written examination * Coursework Assignment</p>
TOTAL	ECTS =5	Total workload: 100H

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
SESS6021	APPLICATIONS OF CFD	
MARINE CRAFT SPECIALISATION		
Prerequisites	Fluid Dynamics or equivalent	
Syllabus		
<p>AIMS: The aims of this module are to:</p> <ul style="list-style-type: none"> * Understand the use of available computational methods for fluid dynamics. * Awareness and appreciation of limitations of computational methods * Use bespoke or commercial computational fluid dynamics analysis techniques to solve real engineering problems. <p>CONTENT: Application of CFD Interpretation of CFD results Guide to Commercial flow solver Practical turbulence modelling Surface panel techniques Low Reynolds number flows Unsteady flows</p>		<p>Lectures: 36h</p> <p>Independent learning:64 h</p> <p><u>Assessment:</u> Written Examination:90min Assignments:2 h</p>
TOTAL	ECTS =5	Total workload:100H

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
SESS3003	ADVANCED NAVAL ARCHITECTURE	
MARINE CRAFT SPECIALISATION		
Prerequisites	Fluid Mechanics, Naval Architecture Dynamics	
Syllabus		
<p><u>AIMS:</u> The aims of this module are to: * Provide the student with an advanced knowledge base and understanding of manoeuvring theory applied to a marine vehicle operating in calm and/or restricted waters.</p> <p><u>CONTENT:</u> Body axes, translations and angular velocities Transformation of axes. General equations of motion in calm water. Linearised equations of symmetric motion. Linearised equations of antisymmetric motion. Fluid actions and slow motion derivatives. Measurements of slow motion derivatives (two and rotating arm tests). Measurements of oscillatory coefficients (planar motion mechanism). Control surfaces and derivatives. Directional stability criteria (Routh-Hurwitz test functions). Details of types of stability. Manoeuvring trials (stability: pull out and spiral (Dieudonne)). Manoeuvring trials (control: circle and zig-zag (Kempf)). Effects of variables on design (speed, trim, draught, ect). Rudder forces and torques. Rudder design, effects of rudder. Nomoto's equations, T-K parameters. Ship/model correlations. Full scaled trails and measured mile.</p>		<p>Lectures: 27h</p> <p>Independent learning: 73h</p> <p><u>Assessment:</u> * 2h written examination *Coursework Assignment</p>
TOTAL	ECTS =5	Total workload: 100H

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
SESS6047	MARITIME DESIGN - UNDERWATER TECHNOLOGY	
MARINE CRAFT SPECIALISATION		
Prerequisites	Fundamentals of Ship Science	
Syllabus		
<p><u>AIMS:</u> The aims of this module are to: * Apply fundamental knowledge to underwater technology design-driven problems.</p> <p><u>CONTENT:</u> Typical assignments which may be carried out in this design office based course include:</p> <p>Buoyancy / trim investigation of submersibles.</p> <p>CFD: Application of panel method (Palisupan) to control surface design.</p>		<p>Lectures: 36h</p> <p>Independent learning: 64h</p> <p><u>Assessment:</u> *Coursework Assignment (2 per module)</p>
TOTAL	ECTS =5	Total workload: 100H

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
SESS6012	POWERCRAFT PERFORMANCE AND DESIGN	
MARINE CRAFT SPECIALISATION		
Prerequisites	Fundamentals of Ship Science	
Syllabus		
<p>AIMS: The aims of this module are to: * Develop an awareness of the basic mechanics and design principles of light-weight powercraft</p> <p>CONTENT: Semi-Displacement Round Bilge Forms Planing Hull Forms Catamarans and Trimarans Powercraft design</p>		<p>Lectures: 18h</p> <p>Independent Learning: 82h</p> <p><u>Assessment:</u> * 2h written examination</p>
TOTAL	ECTS = 5	Total workload: 100H

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
SESS3019	SHIP CONTROL SYSTEMS	
MARINE CRAFT SPECIALISATION		
Prerequisites	Fundamentals of Ship Science	
Syllabus		
<p><u>AIMS:</u> The aims of this module are to: * Provide an understanding of fundamental knowledge and techniques of control. * To develop tools to analyse control engineering problems by MATLAB</p> <p><u>CONTENT:</u> 1. Introduction 1.1 System approach and block diagrams 1.2 Open loop systems 1.3 Closed loop systems. 1.4 Types of controllers. 1.5 Basics of control system design 2 Analysis and Frequency Domain 2.1 s-plane relationship between time and frequency domain. 2.2 Transfer functions 2.3 Routh-Hurwitz stability criterion 3 Frequency reponse 3.1 Nyquist diagrams 3.2 Bode diagrams 3.3 Nichols Charts 3.4 Nyquist stability criterion 3.5 Phase and gain margins 4 Performance Measures 4.1 Steady state error 4.2 Transient performance 4.3 Relationship of poles to phase and margins 5 Application of Theory to Marine Activities 5.1 Steering gear 5.2 Control fin action 5.3 Marine diesels</p>		<p>Lectures: 27h</p> <p>Independent Learning: 73h</p> <p><u>Assessment:</u> * 2h written examination * Supervision example sheets * Coursework assignment</p>
TOTAL	ECTS = 5	Total workload: 100H

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
SESS6013		SAILING YACHT DESIGN
MARINE CRAFT SPECIALISATION		
Prerequisites	Graduate level education in Engineering, Mathematics or Science discipline	
Syllabus		
<p><u>AIMS:</u></p> <ul style="list-style-type: none"> * Provide an introduction to the design tools and processes employed in the design of sailing yachts up to 50m in length. * Illustrate methodology and production techniques in small craft design. <p><u>CONTENT:</u></p> <ul style="list-style-type: none"> * Balance of air and water forces. * Velocity prediction programs. * Statical stability. * Rating and handicap rules. * Hydrodynamics of hull, keel and rudder. * Dynamic behaviour of yachts in waves. * Aerodynamics of sails. * Mast and rigging design. * Materials in construction. * Structural design of hull elements. * Composite engineering of sailing yacht structures. 		<p>Lectures: 18h</p> <p>Independent Learning: 82h</p> <p><u>Assessment:</u></p> <ul style="list-style-type: none"> * 2h written examination * Assignment
TOTAL	ECTS = 5	Total workload: 100H