

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
AERONAUTICAL SPECIALISATION	TMAL02 AIRCRAFT AND VEHICLE DESIGN	
<u>Prerequisites</u>	Solid Mechanics, Engineering Materials, Machine Elements, Applied Mechanics and Heat Transfert	
Syllabus		
<p><u>AIMS:</u> The course gives fundamental knowledge and understanding of the factors that affects the configuration and dimensioning of an aeroplane.</p> <p><u>CONTENT:</u></p> <p>* Design process - Design of aeroplanes - Choice of carrying surfaces and geometries - Initial dimensioning/configuration/propulsion-Aerodynamics- Propulsion-Airframe structure- Stability- Flight mechanics- Special projet work dealing with configuration and dimensioning of an aeroplane.</p>	<p>Lectures: 20h</p> <p>Lessons: 30h</p> <p>Study visit: 4h</p>	
TOTAL	ECTS= 6	Total workload: 54H

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
AERONAUTICAL SPECIALISATION	TMMV01 AERODYNAMICS	
<u>Prerequisites</u>	Analysis, Algebra, Physics (thermodynamics) and Mechanics and Fluid mechanics.	
Syllabus		
<p><u>AIMS:</u></p> <p>The course gives an introduction to aerodynamics with specific emphasis on aircraft. The purpose is to increase the understanding of and interest in aerodynamics by providing practical examples of configuration aerodynamics and modifications to aircraft.</p> <p><u>CONTENT:</u></p> <p>Introduction. Basic equations, e g Navier-Stocker equations, equation of continuity, energy equation, Flow about a body; Aerodynamic characteristics of airfoils. The dynamics of viscous fluids. Incompressible and compressible flow. Airfoils in compressible flow. Boundary layer flow. Viscous effects and secondary flows.</p>		<p>Lectures: 52h</p> <p><u>Assessment:</u> * Written exams *Laboration work</p>
TOTAL	ECTS= 6	Total workload: 52H

EUROMIND European Master In Design and Technology of Advanced Vehicles Systems		
AERONAUTICAL SPECIALISATION	TMAL51 AIRCRAFT CONCEPTUAL DESIGN	
<u>Prerequisites</u>	TMAL02 Aircraft and Vehicle Design, TMMV01 Aerodynamics, TMME50 Flight Mechanics	
Syllabus		
<u>AIMS:</u> To allow students to bring together their previous studies in aeronautics to a practical aircraft design project and in so doing develop the understanding of the disciplines and interrelationship in aircraft design.	Lectures: 22h Lessons: 24h	
<u>CONTENT:</u> This course will utilise the skills learnt in previous aeronautical courses to undertake the conceptual design of an aircraft. This will involve sizing, structures, aerodynamics, flight dynamics and the other disciplines involved in aircraft design. The course will be project based and will lead into the subsequent subject TMAL55	<u>Assessment:</u> * Written report	
TOTAL	ECTS= 6	Total workload: 46H

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
AERONAUTICAL SPECIALISATION	TMAL58 ADVANCED COURSE AIRCRAFT DESIGN	
<u>Prerequisites</u>	TMAL02, TMAL51, TMHP20 is recommended. It is recommended to take TMAL55 in parallel.	
Syllabus		
<u>AIMS:</u> <p>The purpose of the course is to provide engineering students with good understanding of aircraft design so that a good overall picture is obtained and a sound engineering approach to developing new designs linked to industrial operations is developed.</p>		Lectures & Lessons: 60h
<u>CONTENT:</u> <p>Aiframe design, structural dimensioning, design and installation of systems.</p>		<u>Assessment:</u> * Written exam
TOTAL	ECTS= 6	Total workload: 60H

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
AERONAUTICAL SPECIALISATION	TMMV54 COMPUTATIONAL HEAT TRANSFERT	
<u>Prerequisites</u>	Numerical Methods, Algebra, Analysis and Energy Technology basic course	
Syllabus		
<p><u>AIMS:</u></p> <p>This course aims at giving the student knowledge and proficiency in heat transfer and computational methods applied to heat transfer and modelling of practical heat-transfer problems. Special attention is paid to the finite difference method for one-and two-dimensional problems. In addition, the students are given knowledge of other numerical methods for heat-transfer problems and of advanced discretization techniques.</p> <p><u>CONTENT:</u></p> <p>Basic relations for heat transport in fluids and solids. Heat transport across material boundaries. Modelling techniques computational methods in heat transfert, especially. The finite difference method. Discretization techniques.</p> <p>Explicit and implicit numerical methods for one- and two- dimensional problems, both steady-state and non-steady.</p>		<p>Lectures & Lessons: 66h</p> <p><u>Assessment:</u></p> <p>* 2 projets tasks * 1 project work</p>
TOTAL	ECTS= 6	Total workload: 66H

EUROMIND European Master In Design and Technology of Advanced Vehicles Systems		
AERONAUTICAL SPECIALISATION	TGTU60 INFORMATION RETRIEVAL	
<u>Prerequisites</u>		
Syllabus		
<p><u>AIMS:</u></p> <p>The course will provide information literacy, i.e. basic knowledge of how to retrieve and evaluate information, and thus enable the students to continue to learn and to operate effectively in a professional context. The course will provide knowledge of information sources (handbooks, patents, databases, Internet etc), and of strategies for retrieving and using them.</p> <p><u>CONTENT:</u></p> <p>Introduction to the theory and practice of scientific communication. Basic search strategies. Guided training in computer-based information retrieval (Internet, CD-ROM). Training in critical evaluation of printed and electronic information sources. Information retrieval in an area of individual interest, related to engineering / technology.</p>		<p>Lectures & Lessons: 2h Rec. Self-study: 38h</p> <p><u>Assessment:</u> * Participation * 1 assignment * 1 seminar</p>
TOTAL	ECTS= 1,5	Total workload: 40H

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
AERONAUTICAL SPECIALISATION	TMMV53 COMPUTATIONAL FLUID MECHANICS	
<u>Prerequisites</u>	Numerical Methods, Algebra, Analysis, Analysis continuation course, Energy technology basic course, and preferably Modelling and Simulation - Energy and Computational Methods in heat Transfert. Familiarity with MATLAB (or equivalent) is also desirable.	
<u>Syllabus</u>		
<u>AIMS:</u> This course aims at giving the students understanding of and proficiency in computational methods applied to fluid-flow problems. Special attention is paid to finite-difference and finite-volume methods for one- two- and three-dimensional problems. Major attention is devoted to understanding of the coupling between real problem, model and computational model. Knowledge in modelling practical problems is treated.		Lectures & Lessons: 60h
<u>CONTENT:</u> Basic fluid mechanics and its equations. Similary, Problem formulation. Computational methods - an overview, the Finite Difference method, the Finite Volume method, Discretization, Boundary conditions, Transient problems, Geometry transformations, Turbulence and turbulence models		<u>Assessment:</u> * 2 project tasks * 1 project work
TOTAL		ECTS= 7,5
		Total workload: 60H

EUROMIND European Master In Design and Technology of Advanced Vehicles Systems		
AERONAUTICAL SPECIALISATION	TMME50 FLIGHT MECHANICS	
<u>Prerequisites</u>	Calculus, Algebra, Mechanics, Aerodynamics, Automatic Control	
Syllabus		
<u>AIMS:</u> The purpose of the course is to provide the student with basic know to model and analyze the motion of an airplane, particularly with regard to stability characteristics.	Lectures: 34h Labs: 16h	
<u>CONTENT:</u> Aerodynamic forces, static stability, threer dimensional rigid body dynamics, equations of motion of an airplane and their linearization, longitudinal and lateral modes, dynamic stability, autopilots.	<u>Assessment:</u> * Computer assignments	
TOTAL	ECTS= 6	Total workload: 50H

EUROMIND European Master In Design and Technology of Advanced Vehicles Systems		
AERONAUTICAL SPECIALISATION	TMALXX AIRCRAFT PROJECT COURSE	
<u>Prerequisites</u>	TMAL51 Aircraft Conceptual Design	
Syllabus		
<u>AIMS:</u> The aim of the course is to build on the conceptual design project undertaken in TMAL51. As well as further developing aeronautics-specific skills, the course will develop the students ability to work as part of a team towards project deadlines.	Rec. Self-study: 320h	
<u>CONTENT:</u> The course is carried out in the form of a project. This will form the detail design following the conceptual design undertaken in TMAL51. The design predictions and tools will be refined before a prototype vehicle is built and flown. In this way, the goal is to close the design loop by allowing students to both develop the predictions and subsequently validate them against physical testing.	<u>Assessment:</u> * Project work and short oral exam.	
TOTAL	ECTS= 15	Total workload: 320H