

EUROMIND
European Master In Design and Technology of Advanced Vehicles Systems

AUTOMOTIVE SPECIALISATION

	HOURS	ECTS
COURSES	349	35
Performance and Architecture	38	5
Automotive Engineering	20	4
Road handling	51	10
Motor Propulsion group	173	6
Automotive Systems	46	5
Automotive Structure Design and Analysis	[21]	5
DESIGN PROJECT	300	

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
TUITION UNIT TU2	TU2	
AUTOMOTIVE SPECIALISATION	PERFORMANCE AND ARCHITECTURE	
Prerequisites	Mechanics, thermodynamics	
Syllabus		
<p>AIM : * To have a deep knowledge of the automotive product in terms,of architecture and performance</p> <p>CONTENT :</p> <p>* Automotive architecture and performance Presentation of automotive components and their position, and of basic ergonomics rules Presentation of basic vocabulary Performance calculation : fore and aft, vertical and rounding a curve dynamics External aerodynamics Impact issue : biomechanical criteria</p> <p>* Engine architecture and performance Engine architecture : in-line engine, vee-engine, balance, drive Basic principles Performances Practical work : engine assembly/overhaul</p>		<p>Lectures : 38</p> <p>Independent learning : 76</p> <p><u>Assessment:</u> * 2 writer exams</p>
TOTAL	ECTS = 4	Total workload: 114H

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
TUITION UNIT TU2 AUTOMOTIVE SPECIALISATION	TU2 Automotive Engineering	
Prerequisites	Automotive architecture and performance Engine architecture and performance	
Syllabus		
<p><u>AIM :</u> * To have an overview of the automotive industry and its methods</p> <p><u>CONTENT :</u></p> <p>ADVANCED TECHNOLOGIES Hybrid engines Electric engines Active and passive safety</p> <p>VISITS OF INDUSTRIAL PLANTS</p> <p>DESIGN PROJECTS</p>		<p>* Lectures : 20</p> <p>* Independent learning : 40</p> <p>* visits : 20</p> <p>* project : 10</p> <p><u>Assessment:</u> * written report & oral presentation * reports</p>
TOTAL	ECTS = 3	Total workload: 90H

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
TUITION UNIT TU2	TU2	
AUTOMOTIVE SPECIALISATION	ROAD HANDLING	
Prerequisites	Automotive architecture and performance	
Syllabus		
<p>AIM :</p> <ul style="list-style-type: none"> * To know the different steps and the methodology to design a braking system and a suspension/direction system * To have a large technological knowledge in those domains * To know how to simulate the dynamic behaviour of a vehicle <p>CONTENT :</p> <p>BRAKING SYSTEM I Introduction : definition of braking, specifications Theory of braking : forces on vehicles, tire grip and performance, load transfer, braking distribution between axles, types of grip, stopping distance, brakes thermics Regulations Braking system : hydraulic braking circuit, wheel brake, braking control, anti lock braking system</p> <p>SUSPENSION/DIRECTION Technological aspects : torques, suspensions, steering Design : specifications, design rules</p> <p>VEHICLE DYNAMICS Vehicle Dynamics equations Simulation : MATLAB and SIMULINK</p> <p>BRAKING SYSTEMS 2 : project</p>		<p>* Lectures : 51 * project : 100 * Independent learning : 102</p> <p><u>Assessment:</u> * 2 written exams * report & oral representation * Mini-project</p>
TOTAL	ECTS = 8	Total workload: 253H

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TUITION UNIT TU2	TU2	
AUTOMOTIVE SPECIALISATION	MOTOR PROPULSION GROUP	
Prerequisites	Fundamental thermodynamic cycles	
Syllabus		
<p>AIM :</p> <ul style="list-style-type: none"> * To define the functioning of a thermal engine * To know the different steps and the methodology to design a power train <p>CONTENT :</p> <p>PROPULSION AND COMBUSTION Thermodynamics Machines Engines : mixtures characteristics, compression ignition, alternating engine, carburetion/injection, combustion, supercharging</p> <p>ENGINE TECHNOLOGY AND PRELIMINARY DESIGN Combustion systems and torque control Heat transfer and impact on fuel consumption Technology and design</p> <p>TRANSMISSION Transmission functions : torque adaptation and stop Transmission technologies : clutch, parallel gear transmission, differential Speed drive units : infinitely variable speed transmission, ... Shafts : transversal transmission Technological practical work on manual transmissions</p> <p>TRANSMISSION SYSTEM II Project</p>		<p>* Lectures : 73</p> <p>* Independent learning : 146</p> <p>* Project : 100</p> <p>Assessment: * written report & oral presentation * 2 written exams * Mini-project</p>
TOTAL	ECTS = 10,5	Totalworkload: 319 H

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European Master In Design and Technology of Advanced Vehicles Systems		
TUITION UNIT TU2 AUTOMOTIVE SPECIALISATION	TU2 AUTOMOTIVE SYSTEMS	
Prerequisites	Engine technology Engine transmission	
Syllabus		
<p>AIM :</p> <ul style="list-style-type: none"> * To know how to use the different technics of engine control * To define and manage an embedded system <p>CONTENT :</p> <p>ENGINE CONTROL General presentation of an engine control system : main components, technologies Flowmeter function, fuel feed function, ignition function, ... Logic controller Competition Diesel engine control Practical work</p> <p>EMBEDDED SYSTEMS Embedded computer architecture Data transfer and processing architecture Bus and multiplexing technology Electronical interface modules technology Controls Systems safety Virtual prototyping</p>		<p>* Lectures : 46</p> <p>* Independent learning : 92</p> <p><u>Assessment:</u> * 2 written exams</p>
TOTAL	ECTS = 4,5	Total workload: 138H

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TUITION UNIT TU2 AUTOMOTIVE SPECIALISATION	TU2 TRANSMISSION SYSTEM II	
Prerequisites	Transmission I	
Syllabus		
Team project		
TOTAL	ECTS =	Total h = 100

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TUITION UNIT TU2 AUTOMOTIVE SPECIALISATION	TU2 SYSTEMS ENGINEERING	
Prerequisites		
Syllabus		
Difficulties of designing systems : customers'need, functional repartition, supplier control, life cycle, performances Need engineering : 5 needs, how to merge them, interest criteria Functional analysis : functional decomposition, technology tree Cost control : budgeting a project Performance analysis : performance definition Designing a system		
TOTAL	ECTS =	Total h = 20

EUROMIND		
European Master In Design and Technology of Advanced Vehicles Systems		
TUITION UNIT TU3	TU3	
AUTOMOTIVE SPECIALISATION	DESIGN PROJECT	
Prerequisites		
Syllabus		
TOTAL	ECTS = 26	Total workload: 650H