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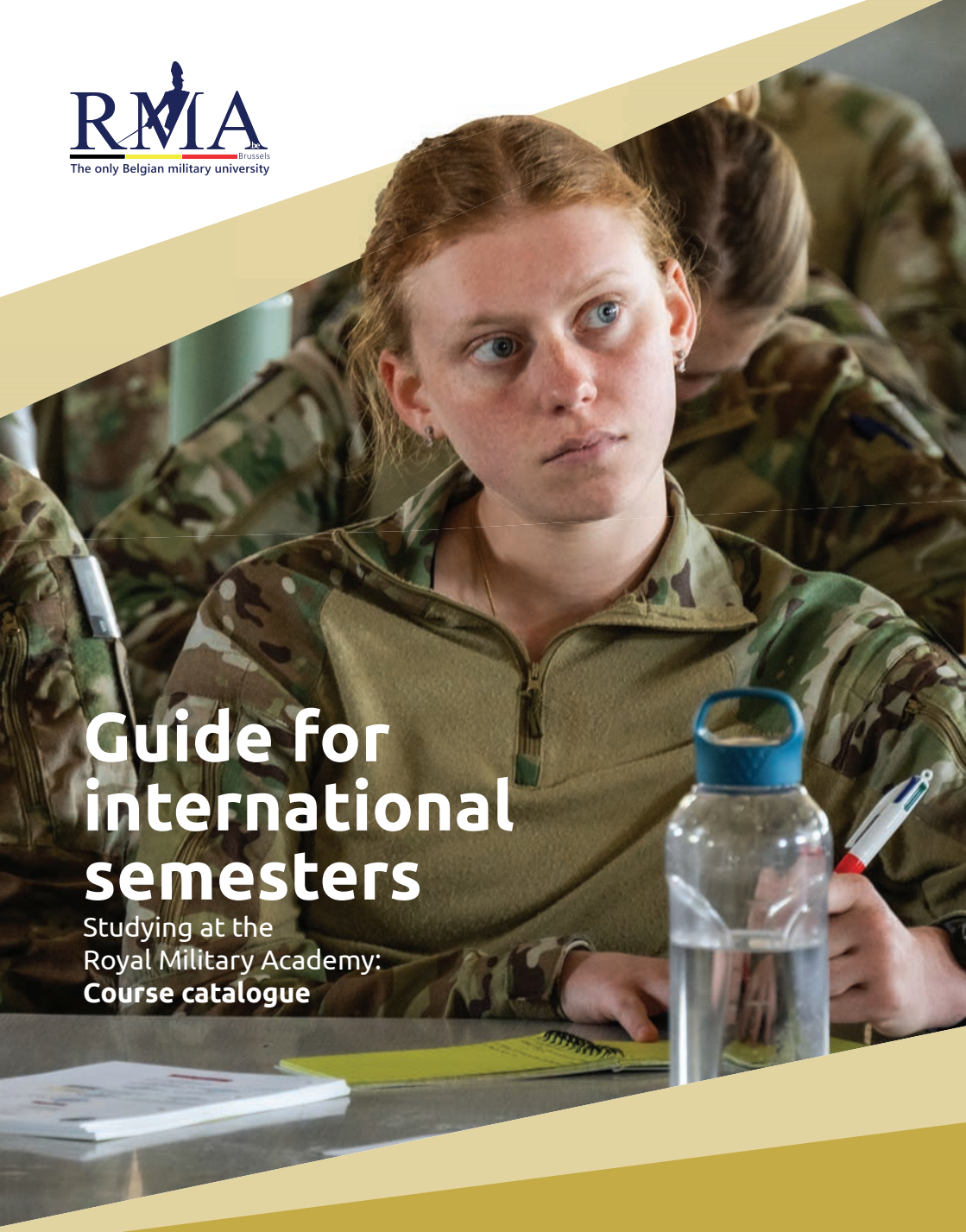

Guide for international semesters

Studying at the
Royal Military Academy:
Course catalogue

DEFENCE

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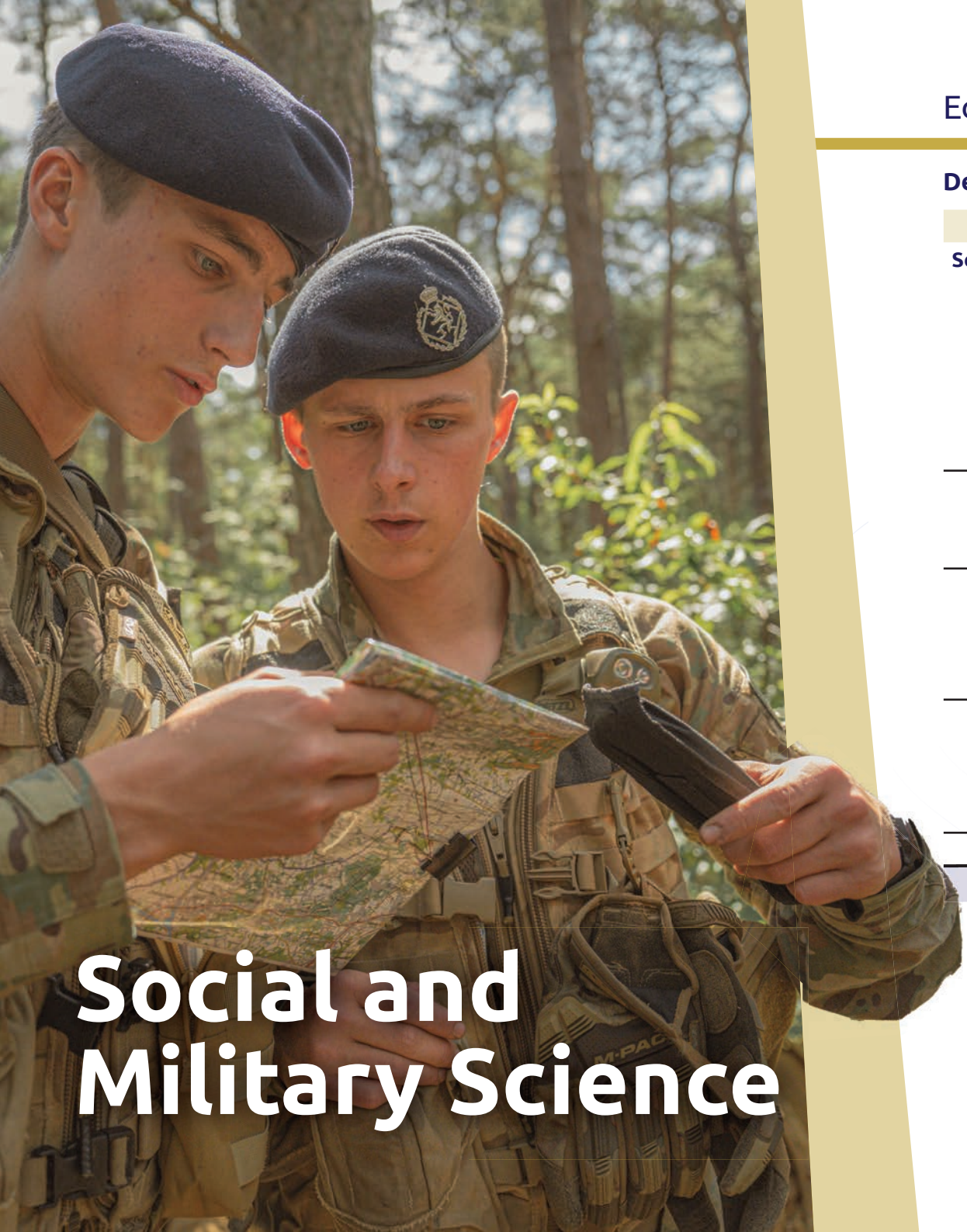
Content table



Social and Military Science

Defence and Security Technologies

	Course title	ECTS
Sem 1	Fuel engines for military platforms	3
	Defence Economics	3
	Telecommunications and C4I	3
	Management of Cybersecurity	3
	Fire Control and Guided Weapons	3
	Mechanics of Materials and Structures	3
	Applied Mechanics	2
All branches except Navy	Cultural Dimensions of Operations	3
	Leadership	3
	Civility and military ethics II	3
Air Force	Aviation Physiology	3
	Aviation Psychology	3
	Turbomachines	3
	Aircraft Propulsion, Stability and Performance	4
Navy	Maritime law	3
	Environment / oceanography	3
	History of naval warfare	3
	Ship Propulsion, Stability and Performance	4
Land Force	Land Vehicles Propulsion, Stability and Performance	4
		33

Management Science for Defence

	Course title	ECTS
Sem 1	Fuel engines for military platforms	3
	Defence Economics	3
	Supply Chain Management	6
	Project and Program Management	6
	Performance Optimalisation	6
All branches except Navy	Cultural Dimensions of Operations	3
	Leadership	3
	Civility and military ethics II	3
Navy	Maritime law	3
	Environment / oceanography	3
	History of naval warfare	3
		33

Security Studies for Defence

	Course title	ECTS
Sem 1	Fuel engines for military platforms	3
	Defence Economics	3
	Cultural Dimensions of Operations	3
	Leadership	3
	Civility and military ethics II	3
	International Conflicts in Historical Perspective	6
	Strategic Studies	6
	Contemporary Security Issues	6
		33

All Majors

	Course title	ECTS
Sem 2	Energy	3
	Management of the Public Sectorand Defence	6
	Master Thesis Supervisor	9
	Master Thesis 2nd Supervisor	6
	Master Thesis Jury	3
		27

Total: 60

Fuel engines for military platforms

Credits:
3 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written and 1 oral exam

Teaching content:

1. Propulsion systems
- Propulsion systems criteria
- Types of propulsion systems
- Engine characteristics

2. Thermodynamics
- Thermodynamic principles
- Practical cycle calculations

3. Piston engines
- Generalities
- Connecting rod - crankshaft
- mechanism
- Two- and four stroke engines
- Engine components
- Combustion process
- Dynamics
- Fuel supply, lubrication and cooling

4. Turbomachinery
- Types of engines
- Performance
- Components

Defence Economics

Credits:
3 ECTS

Type of Class:
Integrated class

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written exam

Cultural Dimensions of Operations

Credits:
3 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written and 1 oral exam

Teaching content:
The aim of this course is to better understand the complexities of contemporary conflicts and of military operations conducted both in remote operational theaters as in homeland operations.
Based on case-studies related to contemporary military operations, this course will focus on the analysis of social and cultural dimensions surrounding the military environment and to what extent these dimensions exert a significant influence on the nature of the conflicts and on the approaches that are chosen in trying to resolve them. In a first part, this provides an overview of key conceptual elements of military culture. The second part looks at the practical implications of cultural dimensions in current conflicts. Cadets are divided into small groups of students and are allowed to choose one article (cleared by the Professor in the reader) that they would like to develop. They research the specific topic and thenbrief their findings to the class in a 30 minute presentation which is followed by a group discussionand additionally moderated by the Professor.

Leadership

Credits:
3 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 oral evaluation, 1 written exam

Civility and military ethics II

Credits:
3 ECTS

Type of Class:
Integrated class

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written exam

Teaching content:
The main objective of this course is to undertake an advanced study of some of the issues and themes that were already to some extent examined in the Ba 2 course 'Citizenship and MilitaryEthics I'.
The course is divided into two-hour sessions. During these sessions a journal article or a bookchapter covering a specific issue or subject in the domain of citizenship and/or military ethics willbe treated. During the first period of each two-hour session the students will be asked to prepare thetext, during the next period the text will be discussed in class. The main purpose of this approach is to enhance as much as possible the interactive process in class.

Telecommunications and C4I

Credits:
3 ECTS

Type of Class:
Integrated class, exercises and visit

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written exam

Teaching content:
- link aggregation
- STP
- routing : OSPF
- IPv6
- VoIP
- SDN

Management of Cybersecurity

Credits:
3 ECTS

Type of Class:
Integrated class

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written exam

Fire Control and Guided Weapons

Credits:
3 ECTS

Type of Class:
Integrated class

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Mechanics of Materials and Structures

Credits:
3 ECTS

Type of Class:
Integrated class and exercise

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written exam

Teaching content:
- Static Equilibrium of beam-like structures
- Determination of support reactions
- Determination of internal forces
- Basics of materials science
- Geometric characteristics of cross-sections
- Normal stresses in Beams
- Shear Stresses in Beams
- Deformation of straight beams

Applied Mechanics

Credits:
2 ECTS

Type of Class:
Integrated class and exercise

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 oral evaluation, 1 written exam

Teaching content:
1. Conservation laws of mass, momentum with a focus on thrust by reaction and energy
2. Dimensional analysis limited to force coefficients, Mach- and Reynolds-numbers
3. Heat exchange (convection, radiation, conduction)
4. Lift and drag forces on bodies
   - Forces coefficients
   - Dependency on shape, angle, Ma and Re
   - Polar curves
5. Boundary layer
   - Velocity profile
   - Laminarity/turbulence
   - Influence on force coefficients
   - Boundary layer control
6. Effect of compressibility on the forces
   - Flow tables in compressible flows
   - Normal/oblique shock
   - Expansion
   - Wave drag
   - Flow over a supersonic wing/fin
7. Fundamentals of flow in nozzles
   - Isentropic cases
   - Non-isentropic cases

Supply Chain Management

Credits:
6 ECTS

Type of Class:
Integrated class and exercise

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
2 written evaluation, 1 written exam

Teaching content:
This course consists of 2 main parts. In part 1 we give an overview of classical quantitative decision support tools in the domain of management science such as spreadsheet modelling, linear and integer programming, decision making under

uncertainty and multicriteria decision making. In part 2 we zoom in on supply chain management and look in more detail at specific decision supportmodels for supply chain processes such as forecasting and inventory management.

Part 1: Decision Support Tools
1. Introduction
2. Linear programming: basic concepts
3. Linear programming: formulation and applications
4. What-if analysis for linear programming
5. Network optimization problems
6. Using binary integer programming to deal wit yes-or-no decisions
7. Network problems

Part 2: Operations and supply chain management
8. Forecasting
9. Inventory management
10. Multicriteria decision making: the analytical hierarchy process

Supply Chain Management

Credits:
6 ECTS

Type of Class:
Integrated class

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
2 written evaluation, 1 written exam

Performance Optimalisation

Credits:
6 ECTS

Type of Class:
Integrated class

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
2 written evaluation, 1 written exam

Aviation Physiology

Credits:
3 ECTS

Type of Class:
Integrated class and exercise

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written exam

Teaching content:

- Chapter 1 : General introduction + atmosphere (1 hr classroom lecture)
- Chapter 2 : Respiration and circulation (2 hrs classroom lecture)
- Chapter 3 : Hypoxia and the influences of decreased partial pressure of oxygen (4 hrs classroomlecture)
- Chapter 4 : Influences of changes in barometric pressure (1 hr class room lecture)
- Chapter 5 : Noise and vibrations (1 hr classroom lecture)
- Chapter 6 : Health Hygiene and physical condition for aviators (1 hr classroom lecture)
- Chapter 7 : Spatial disorientation and illusions (2 hrs classroom lecture)
- Chapter 8 : Accelerations (4 hrs class room lecture)
- Chapter 9 : Ejections (2 hrs classroom lecture)
- Chapter 10 : Airsickness (1 hr classroom lecture)
- Chapter 11 : Decompression sickness and explosive decompression (2 hrs classroom lecture)
- Chapter 12 : Thermal stress (1 hr classroom lecture)
- Chapter 14 : Vision and night vision (2 hrs
- classroom lecture)
- Chapter 15 : Nervous system (1 hr classroom lecture , not instructed in 2008)
- Chapter 16 : Sleep, fatigue and circadian rhythm (2 hr classroom lecture)
- Chapter 17 : Tropical missions (1 hr classroom lecture)
- Chapter 18: Aeromedical Evacuation
- Following Learning Objectives (LO) ATPL will be covered during the course :
- 040 01 00 00 HUMAN FACTORS: BASIC CONCEPTS
- 040 02 01 00 Basics of flight physiology
- 040 02 01 01 The atmosphere
- 040 02 01 02 Respiratory and circulatory system
- 040 02 01 03 High-altitude environment
- 040 02 02 00 Man and environment: the sensory system
- 040 02 02 01 Central, peripheral and autonomic nervous systems
- 040 02 02 02 Vision
- 040 02 02 03 Hearing
- 040 02 02 04 Equilibrium
- 040 02 02 05 Integration of sensory inputs
- 040 02 03 00 Health and hygiene
- 436
- 040 02 03 01 Personal hygiene
- 040 02 03 02 Body rhythm and sleep
- 040 02 03 03 Problem areas for pilots
- 040 02 03 04 Intoxication
- 040 02 03 05 Incapacitation in flight

Aviation Psychology

Credits:
3 ECTS

Type of Class:
Integrated class and exercise

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written exam

Teaching content:

- Chapter 1 : Introduction
- Chapter 2 : Stress
- Chapter 3 : Sleep
- Chapter 4 : Cognitive psychology
- Chapter 5 : Learning processes
- Chapter 6 : Personality, individual differences and group behaviour
- Chapter 7 : Communication and cooperation
- Chapter 8 : Human factors in aviation safety
- Teamwork : Paper and presentation
- Following Learning Objectives (LO) ATPL will be covered during the course :
- 040 03 00 00 BASIC AVIATION PSYCHOLOGY
- 040 03 06 00 Human overload and underload
- 040 03 06 01 Arousal
- 040 03 06 02 Stress
- 040 03 06 05 Fatigue and stress management
- 040 03 01 00 Human information processing
- 040 03 01 01 Attention and vigilance
- 040 03 01 02 Perception
- 040 03 01 03 Memory
- 040 03 02 00 Human error and reliability
- 040 03 02 01 Reliability of human behaviour
- 040 03 03 00 Decision-making
- 040 03 01 04 Response selection
- 040 03 02 02 Mental models and situation awareness
- 040 03 05 01 Personality, attitude and behaviour

- 040 03 05 02 Individual differences in personality and motivation
- 040 03 04 02 Coordination (multi-crew concepts
- 040 03 04 03 Cooperation
- 040 03 04 04 Communication
- 040 03 02 03 Theory and model of human error
- 040 03 02 04 Error generation
- 438
- 040 03 04 00 Avoiding and managing errors: cockpit management
- 040 03 05 03 Identification of hazardous attitudes (error proneness)
- 040 03 07 00 Advanced cockpit automation

Turbomachines

Credits:
3 ECTS

Type of Class:
Integrated class

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 written and 1 oral evaluation, 1 oral exam

Teaching content:
This course treats the ATPL learning objectives regarding turbine engines, see section 021 11 ofAnnex I in https://www.easa.europa.eu/document-library/agency-decisions/ed-decision-2018001r.

- 021 11 01 00 Basic principles
- 021 11 01 01 Basic generation of thrust and the thrust formula
- 021 11 01 02 Design, types components
- 021 11 01 03 Coupled turbine engine: design, operation, components and materials
- 021 11 01 04 Free turbine engine: design, components and materials
- 021 11 02 00 Main-engine components
- 021 11 02 01 Aeroplane: air intake
- 021 11 02 02 Compressor and diffuser
- 021 11 02 03 Combustion chamber
- 021 11 02 04 Turbine
- 021 11 02 05 Aeroplane: exhaust
- 021 11 03 00 Additional components and systems
- 021 11 03 01 Engine fuel system
- 021 11 03 02 Engine control system
- 021 11 03 03 Engine lubrication
- 021 11 03 04 Engine auxiliary gearbox
- 021 11 03 05 Engine ignition
- 021 11 03 06 Engine starter
- 021 11 03 07 Reverse thrust

- 021 11 04 00 Engine operation and monitoring
- 021 11 04 02 Starting malfunctions
- 021 11 04 03 Re-light envelope
- 021 11 05 01 Thrust, performance aspects and limitations
- 021 11 06 01 Design, operation, functions, operational limitations

Aircraft Propulsion, Stability and Performance

Credits:
4 ECTS

Type of Class:
Integrated class and exercise

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Teaching content:
This course discusses flight mechanics: the kinematics and dynamics of and around the centre ofgravity of an aircraft, which is considered to be rigid.
The course consists of:
1. Performance (SM931a)
- performance in straight and level flight
- load factor, manoeuvres in the vertical plane and gusts
- manoeuvres in the horizontal plane
- energy management
- take-off and landing analysis

2. Stability (SM931a)
- the aerodynamic centre
- conditions for longitudinal stability and equilibrium
- conditions for lateral and directional stability
- interaction between slip, roll, and yaw; stability derivatives
- control derivatives of roll and yaw control
- notions of dynamic stability
- coupling with aeroelasticity

3. Propulsion (SM931b)
4. Practical exercises
In the practical exercise sessions students solve problems under supervision. The selected problemsare a direct application of knowledge and concepts gained in the lectures.
5. Project: the student makes a comprehensive performance study through its own calculation sheetof an aircraft and of its propulsion. The project is defended orally.

Maritime law

Credits:
3 ECTS

Type of Class:
Integrated class

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written and 1 oral exam

Environment / oceanography

Credits:
3 ECTS

Type of Class:
Integrated class, exercise and visit

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written exam

Teaching content:
The course is an introduction to descriptive oceanography. It starts with a short overview of thehistory and evolution of oceanography/oceanology.. The course develops the course topic from a top-down perspective, starting with the creation of the earth and the oceans. Different oceanographic phenomena are discussed, such as tectonic activity and its impact on the oceans' topography. Thecreation and impact of sediments are also explained.
Starting from the elementary characteristics of H^2O, specific characteristics of sea water are derived. Elements such as salinity, water layers stratification, transmission of light in water, thermostatic effects, gas cycles and chemical equilibrium of the oceans are introduced (including acidification).
The use of sound as a means of detection in water are developed, introducing the sonar equation andits different elements. A basic knowledge of the ray path theory is taught with a focus on anti-submarine warfare operations.
The atmospheric and oceanic circulation models are explained as well as their respective interaction. Phenomena such as waves are introduced as well as coastal classification.
Finally, the practical side of oceanography is further reinforced by a visit (RV Belgica, MWU orBMM) and/or a guest speaker from MR/Sys-N.

History of naval warfare

Credits:
3 ECTS

Type of Class:
Integrated class and exercise

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Teaching content:
The course retraces the history of naval warfare from the classical antiquity to the contemporary period. It focuses on the importance and the use of navies. They were and still are instrumental as ameans of protecting the essential Sea Lines of Communication that assure more than 90% of global trade. Additionally, in peace time navies are used as deterrents and as means of applying politico-military pressure, while during a war they shape the battlefield and support land and even airoperations. The history of naval warfare is divided in following periods, with more emphasis on 20th centurywarfare

1- Age of the galleys
2- Middle Ages
3- Rise of the age of sail
4- Golden age of sail
5- Steam and Ironclads
6- First World War
7- Second World War
8- Contemporary period

We follow the historical evolution of naval warfare in terms of technology, tactics and organization.The three main technological characteristics of a ship that shape that evolution form the red line throughout the course: structure, propulsion and fighting power of a ship. The context, the conductand the consequences of important historical naval campaigns and battles are studied in greaterdetail.

Land Vehicles Propulsion, Stability and Performance

Credits:
4 ECTS

Type of Class:
Integrated class and exercise

To be covered in:
Ma SSMW International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Teaching content:

1. Vehicle design and mobility
   - Classification of vehicles
   - Coordinate system
   - Vehicle design
   - Safety
   - Regulations
2. Prime movers for motor vehicles
   - Internal combustion engines
   - Electric vehicles
   - Fuel Cells
   - Hybrid Vehicles
3. Propulsion
   - Tire mechanics
   - Non driven wheel
   - Driven wheel
   - Propulsion equation of a vehicle
4. The clutch
   - Dynamics
   - Technology
5. The gearbox
   - Choice of a gear ratio
   - Technology of the gearbox
6. Propeller shaft and differential
   - FWD
   - RWD
   - Differential
7. Steering
8. Braking
   - Dynamics of braking
   - Technology of the braking system
   - ABS
9. Suspension
   - 488
   - Guiding elements
   - Force elements

Energy

Credits:
3 ECTS

Type of Class:
Integrated class, exercise and visit

To be covered in:
Ma SSMW International Semester 2 and additional participants

Evaluation:
1 written evaluation, 1 written exam

Teaching content:

By means of actual numbers, we introduce the course with an overview of the energy problem of the world. Sustainability, renewability and other important phenomena like global warming, acid rain, etcetera, are cited one-by-one.
The world nowadays relies very much on energy to satisfy its actual material needs. The tendency is that in the future, the importance of energy will only grow for the next generations. Whether the energy needs are in terms of transport, heat or electricity, the analysis of the problem is addressed in the lectures.

The discussion is based on the physical laws of conserved quantities from applied mechanics and thermodynamics. The transformation of the different primary energies into final energy forms available on the market is subdivided into different chapters: fossil fuels, renewables, and nuclear energy. The principles behind all major conversion processes are explained and discussed, as well as future applications, new trends and opportunities. For most conversions, the energy efficiency(firstorder approximation, e.g. Carnot efficiency for the thermodynamic cycles) is computed and possible savings estimated, without hiding social and environmental aspects.

Management of the Public Sector and Defence

Credits:
6 ECTS

Type of Class:
Integrated class and exercise

To be covered in:
Ma SSMW International Semester 2 and additional participants

Evaluation:
2 written evaluations, 1 oral exam

Teaching content:

The most important premise of this course is that public administration, and consequently public management matters. There is a tendency among the public to equate politics and governments only with recurrent events (e.g. elections) and with visible conflicts between politicians that generally shape major political and policy developments. These developments and the resulting activities areindeed important for governing a society, but there is a massive amount of activity involved in translating major decisions, expressed in laws and decrees, made by politicians into action, and indelivering public programs or services to citizens. Legislatures and political executives may pass allthe laws they wish, but unless public managers and public administration execute those laws effectively, little or nothing will actually happen. Politicians have the general duty and responsibility to take various decisions to govern a society, i.e.to allow a society to function properly. In this course, we study the different levels that intervene in the global process of public management and public administration.
In the first chapter, we elaborate on the concept of politics. We define the concept, starting with an etymological definition and a brief historical overview. Then we go deeper into the issue of political ideologies. Next, we concentrate on the notion of democracy and explore how civilians canparticipate in political life.

After having introduced some important issues related to political science, we deal with public governance in the second chapter. We start with elucidating the notion ?state? as the most importantform of polity and political organization, and then further discuss two of the three basic organizations in a modern state: the parliament and the government. We end the chapter byintroducing the basic principle of budgetary law.
The third chapter deals with the bureaucratic executive branch (i.e. public administration, publicmanagers and public servants). We first discuss the role of public administration in governing. Then we concentrate on the theories about public administration, and finally we give some reflections about the roles of public servants and the interactions between public servants and politicians.
In the fourth chapter, we explain the Belgian case. We will go deeper into the creation of the Belgian federal state as we currently know it and the impact of the most important state reforms on the functioning of the Belgian society. We then comment on the most important administrative reformsat federal level and end the chapter with a description of the public sector in Belgium.
In the final chapter of the course, we first elucidate the theoretical concepts with regard to internal control (i.e. the ICS-framework). We then outline the Belgian legal framework and finally clarify the ICS-step-by-step plan, using a concrete example of the Belgian Defense.

Master Thesis Supervisor

Credits:
9 ECTS

Type of Class:
Integrated class

To be covered in:
Ma SSMW International Semester 2 and additional participants

Evaluation:
1 written exam

Master Thesis 2nd Supervisor

Credits:
6 ECTS

Type of Class:
Integrated class

To be covered in:
Ma SSMW International Semester 2 and additional participants

Evaluation:
1 written exam

Master Thesis Jury

Credits:
3 ECTS

Type of Class:
Integrated class

To be covered in:
Ma SSMW International Semester 2 and additional participants

Evaluation:
1 oral exam

POLITECHNICS

Educational offers Master 1 POL

All branches Except COMBAT Engineering

	Course title	ECTS
Sem 1	Design Principles and Evaluation of Armament and Ammunition	8
	Tactical Military Sensors	7
	Electrical Power Systems	6
	Introduction to Engineering Management	3
	Leadership	3
	Cabin Environment of Military Platforms	3
		30
Sem 2	Networks and Security Awareness	7
	Ballistic Impact and Protection Fundamentals	3
	Intelligent Decision Support Methods	6
	Military Satellite based Positioning	3
	Guided Weapons	6
	Digital Technology for Sensors and Weapons	5
		30

Total: 60

Land Force - Combat Engineering

	Course title	ECTS
Sem 1	Design Principles and Evaluation of Armament and Ammunition	8
	Tactical Military Sensors	7
	Electrical Power Systems	6
	Introduction to Engineering Management	3
	Leadership	3
	Soil Mechanics	5
		32
Sem 2	Networks and Security Awareness	7
	Ballistic Impact and Protection: Fundamentals	3
	Intelligent Decision Suppor tMethods	6
	Military Satellite based Positioning	3
	Construction Engineering Design	5
	Analysis of Constructions	5
		29

Total: 61

Structures, Mobility and Propulsion

	Course title	ECTS
Sem 1	Ballistic Impact and Protection Applications	3
	Turbomachines	3
	Effects of Explosions on Structures	3
	Numerical and Experimental Methods applied to Continuum Mechanics	6
	Ageing of Systems	3
	Mechanical Systems Integration	3
	Autonomous Systems	3
Combat Engineering branch	Structural Analysis and Finite Elements	3
	Design of Steel Structures	6
	Design of concrete structures	3
	Geotechnical engineering	3
Other Land Force branches	Land Vehicle Performance and Stability	6
Navy	Ship Stability and Performance	6
Air Force	Performance and Stability of Fixed Wing Aircraft	4
	Air Vehicle Technology	2
		30
Sem 2	Aircraft Propulsion	3
Air Force	Performance and Stability of Rotary Wing Aircraft	3
Other Land Force branches	Land Vechicle Technology	3
	Fire Control	3
Navy	Naval Ship technology	3
	Ship Propulsion	3
Land Force	Energy Performance of Buildings	6

	Master Thesis Supervisor	12
	Master Thesis 2nd Supervisor	8
	Master Thesis Jury	4
		30

Total: 60

Network Enabled Capabilities

	Course title	ECTS
Sem 1	Strategic Military Sensors	6
	Distributed Information Systems	6
	Information Networks	6
	Advanced Wireless Communication Systems	6
	Communication Subsystems	6
		30
Sem 2	Cyber Defense	6
	Master Thesis Supervisor	12
	Master Thesis 2nd Supervisor	8
	Master Thesis Jury	4
		30

Total: 60

Design Principles and Evaluation of Armament and Ammunition

Credits:
8 ECTS

Type of Class:
Integrated class, exercises and visit

To be covered in:
Ma 1 POL International Semester 1 and additional participants

Evaluation:
2 written evaluations, 1 oral exam

Teaching content:
The course WA411 limits itself to the classical gun systems, i.e. excluding rockets, missiles and electrical systems. It covers small, medium and large calibre gun systems, next to kinetic energy non-lethal weapons.
The level of ambition of this course is not aimed at the development of new weapon systems butmore at acquiring the skills to follow-up weapon system projects and evaluate their feasibility froma technical point of view.
Based on "first principle" approaches this course will provide the necessary tools to validate weaponsystems projects and/or concepts. A number of weapon system concepts will be investigated in more detail both by desktop calculations and laboratory sessions in the Laboratory of the Department ABAL.
The course will be concluded by a one-day visit to the relevant Belgian industry.

Tactical Military Sensors

Credits:
8 ECTS

Type of Class:
Integrated class, exercises and visit

To be covered in:
Ma 1 POL International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Teaching content:
This course starts with a general introduction on military remote sensing. Based on the spectral domain where the sensors are operating they will be subdivided in electro-optical/infrared (EO/IR)sensors and radar systems. This subdivision is the basis for the general structure of the course which will consist of 3 parts: (1) passive EO/IR sensors, (2) active EO/IR sensors, (3) radar. For each part, the information is structured in the same way. First the relevant phenomenology is described,explaining the proper emission of the sources and targets, their reflection properties, and the transmission behavior of the atmosphere. Then the description of the sensor itself follows including hardware, signal/image processing and measurement principles. Combining all that information leads to an understanding of the sensor performance and limitations, and how countermeasures could work. Directed Energy Weapons are also discussed here. A wrap-up is foreseen for each part and each sensor, describing military applications and future trends.

Cabin Environment of Military Platforms

Credits:
3 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 1 POL International Semester 1 and additional participants

Evaluation:
2 written evaluations, 1 oral exam

Teaching content:
- Define and estimate properties of moist air
- Model the static and (simplified) dynamic thermal heat transfer
- Solve an energy balance in the presence of different modes of heat transfer
- Being able to calculate the necessary ventilation needs in order to obtain thermal comfort conditions
- estimate friction losses in ventilation systems
- Analyze a complete vehicle ventilation system

Electrical Power Systems

Credits:
6 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 1 POL International Semester 1 and additional participants

Evaluation:
1 written and 1 oral evaluation, 1 written and 1 oral exam

Teaching content:
Basic Laws

- Circuit laws - Faraday, Laplace, Maxwell-Ampère - Active and reactive power, power balance, power factor - Phasors
- General overview of electrical power systems
- Introduction: some numbers about electricity production
- General power system properties
- Electric power generation : Thermal power plants
- Nuclear physics in electric power generation : Nuclear Power Plants
- Renewable electricity production (hydropower - wind - solar)
- Energy storage.
- Electric safety
- Earthing - Hazards - Switching devices - Over-current protection - Protection against leakagecurrents
- Electrical power systems components
- Tansformers
- Three phase networks
- General overview of electrical machines (DC, induction, synchronous)
- Synchronous machines (alternator, motor)

Introduction to Engineering Management

Credits:
3 ECTS

Type of Class:
Integrated class

To be covered in:
Ma 1 POL International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written exam

Leadership

Credits:
3 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 1 POL International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written exam

Teaching content:
At the end of the course, the student possesses the academic competencies required to lead a group according to the Vision of Leadership at Belgian Defence.

Soil Mechanics

Credits:
5 ECTS

Type of Class:
Integrated class

To be covered in:
Ma 1 POL International Semester 1 and additional participants

Evaluation:
1 written exam

Guided Weapons

Credits:
6 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 1 POL International Semester 2 and additional participants

Evaluation:
2 written evaluations, 2 oral exams

Teaching content:
In the first part of the course (2 Hr theory, 20 Hr practical work) different practical aspects of rocket propulsion are addressed in the form of laboratory sessions: processing of extruded rocket propellant, burning rate law determination in closed vessel, life firing tests, study of sensitivity to mechanical and electrical stimuli and determination of the heat of explosion, and safety aspects related to deflagration-to-detonation transition and the insensitive munition concept.
In the second part of the course (26 Hr theory, 18 Hr practical work), the four main components of a guided weapon are discussed : guidance, control, propulsion and warhead. The emphasis is on guidance and control, where mathematical models are developed. The trajectory models (2DOF to 6DOF models), combined with the guidance models, lead to launch and intercept envelopes and the definition of avoidance techniques. The chapter on guidance methods presents technical solutions for guidance problems, based on available sensors and guidance laws. In the chapter on control methods, the technical solutions for the control problem are compared.

The chapters on propulsion and warhead are limited to comments on the selection of engines and warhead as a function of therequirements.

Digital Technology for Sensors and Weapons

Credits:
5 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 1 POL International Semester 2 and additional participants

Evaluation:
2 written evaluations, 1 oral exam

Teaching content:
The course material will cover :

- Integrated circuit technology (CMOS/BJT/BiCMOS)
- Transistor modelling
- Current and voltage reference circuits
- Basic building blocks (amplifiers, buffers, differential amplifier)
- Feedback
- Comparator Design
- OPAMP Design (Miller OPAMP)
- Stabilization techniques
- Noise in electronic circuits
- Sensors and Sensor interfacing

Networks and Security Awareness

Credits:
7 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 1 POL International Semester 2 and additional participants

Evaluation:
2 written evaluations, 1 written exam

Teaching content:

- Introduction to networks and OSI model
- Protocols (layer 1 to 7)
- Introduction to routing
- Security : introduction
- Security threats
- Security controls: filters and cryptography
- Detection of security incidents
- OSINT

Ballistic Impact and Protection: Fundamentals

Credits:
3 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 1 POL International Semester 2 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Teaching content:
The course TP424 addresses the field of terminal ballistics from both a practical and a theoretical point of view. This includes an overview of the different ballistic threats present on the modern battlefield, modelling approaches to evaluate the effects of these threats, next to introducing basic protective schemes based on the aforementioned models.
The level of ambition of this course is not aimed at the development of new weapon systems or ballistic protection systems but more at acquiring the skills to evaluate the feasibility of weapon systems or ballistic protection concepts from a technical point of view.
Based on “first principle” approaches this course will provide the necessary tools to validate weapon system and ballistic protection concepts. A number of modelling approaches in this field will be investigated in more detail both by desktop calculations and/or simulations using finite element software.

Intelligent Decision Support Methods

Credits:
6 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 1 POL International Semester 2 and additional participants

Evaluation:
2 written evaluations, 1 oral exam

Teaching content:
1. Introduction
2. Uninformed Search
3. Informed Search
4. Adverserial Search
5. Constraint Satisfaction Problems
6. Markov Decision Processes
7. Reinforcement Learning
8. Classification

9. Clustering
10. Deep Learning
11. Natural Language Processing

Military Satellite based Positioning

Credits:
3 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 1 POL International Semester 2 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Teaching content:

- Satellite geodesy made easy
- Brief review of satellite geodesy
- The legacy Global Positioning System
- The European Galileo system
- Overview of modern GNSS system
- Solving the navigation problem
- Augmentation systems
- Open source GNSS processing

Construction Engineering Design

Credits:
5 ECTS

Type of Class:
Integrated class

To be covered in:
Ma 1 POL International Semester 2 and additional participants

Evaluation:
1 written exam

Analysis of Constructions

Credits:
5 ECTS

Type of Class:
Integrated class

To be covered in:
Ma 1 POL International Semester 2 and additional participants

Evaluation:
1 written exam

Strategic Military Sensors

Credits:
6 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
2 written evaluations, 1 oral exam

Teaching content:
Sensing platforms (UGV, UAS, airborne/spaceborne imaging)
Sensors & their specificities (EO/IR, hyperspectral imaging, range-based imaging (lidar, radar).
Advanced signal processing (Moving target Indication, Syntetic Aperture Radar, Space-Time Adaptive Processing).
Image post-processing, princples of image compression;
Distributed Geographical Information Systems.

Distributed Information Systems

Credits:
6 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Teaching content:
1.6 Understanding of extensive subject matter in the field of Engineering and Military Sciences -Telecommunications and Networks.
2.6 Applying relevant and valid information to devise arguments, solve complex problems, formulate recommendations, and/or make decisions in the field of Engineering and Military Sciences - Telecommunications and Networks.

Information Networks

Credits:
6 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
2 written evaluations, 1 oral exam

Teaching content:
Advanced networking:
link aggregation

- STP
- IPv6
- VoIP
- SDN

Application in a real setup (project)
Digital forensics:

- OS principles and disk forensics
- Windows internals and windows forensics
- Memory forensics
- Network forensics
- Mobile device forensics

Information Networks

Credits:
6 ECTS

Type of Class:
Integrated class, exercises and visit

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
1 written and 1 oral evaluation, 1 oral exam

Teaching content:
The course gives an overview of the theory and practice behind many of today´s communications systems in the domain of source coding, channel coding and modulation techniques. The course introduces the architecture and technology of telecommunication systems at a block diagram level with an accent on radio transmitters/receivers and wireless communication networks.

The following topics are covered:

- Introduction to Information Theory.
- Source coding, including Vocoders.
- Forward Error Coding: linear codes, cyclic codes (BCH, RS), convolutional codes, turbo codes,LDPC codes.
- Software Defined Radio (SDR) technology.
- Noise performance and linearity of radio transmitter and receiver.
- Digital modulation schemes, including Spread spectrum techniques and Orthogonal Frequency Division Multiplexing (OFDM).
- Optimal digital receivers for band limited signals in an AWGN channel.
- Carrier and symbol synchronisation.
- Multiple-Input Multiple-Output techniques.
- Wireless cellular communication systems.

Communication Subsystems

Credits:
6 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Teaching content:
The course gives an overview of the theory and practice of the three key subsystems of today's communication systems, namely the transmission line, the antenna and the propagation channel.
For each of the subsystems the course introduces the principle of operation, defines the parameter scharacterizing its functioning and performances with special attention to their respective advantages and drawbacks in definite applications, in particular those related to defence and security.
The following topics are covered:

- General theory of transmission line
- Conductive transmission lines
- Dielectric transmission lines
- Radiation from elementary sources
- Transmitting antenna
- Receiving antenna
- General equation of a radiolink
- Aperture antennas
- Array antennas
- Propagation modes of a radiowave
- Large scale and small scale fading

Ballistic Impact and Protection: Applications

Credits:
3 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Teaching content:
The course TP521 is a continuation of the concepts taught in the course TP424, applying and extending the content of the latter to applications specifically for the battlefield. The course will include state-of-the-art concepts and methods for the design and evaluation of platform and vehicle armour systems and personal armour systems (body armour). The importance of ballistic protection as part of a complete system will also be illustrated using the 'survivability onion' concept, and by illustrating trade-offs that can be made linked to ballistic protection (reactive armour, active armour, threat detection, damage mitigation). Due to the shift in threat scenario as encountered in current operations, an important part of the course will also be devoted to the effects of blast loadings on both vehicle and personal armour systems, and how these systems are designed in order to mitigate both ballistic and blast effects.
The level of ambition of this course is not aimed at the development of new ballistic protection systems but more at acquiring the skills to evaluate the feasibility of ballistic protection concepts from a technical point of view.
Based on 'first principle' approaches this course will provide the necessary tools to validate ballistic protection concepts. A number of modelling approaches in this field will be investigated in more detail both by desktop calculations and/or simulations using finite element software.

Turbomachines

Credits:
3 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Teaching content:
- Fundamental equations for turbomachines
- Centrifugal turbopumps
- Axial turbines
- Axial and radial compressors

Effects of Explosions on Structures

Credits:
3 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written exam

Teaching content:
- General classification of explosions
- Shock wave characterisation for non-confined explosions
- Study of shock wave propagation and reflection
- Use of scaling laws for model evaluation
- Blast loading of structures
- Dynamic behaviour of construction materials
- Resistance function for steel and reinforced concrete beams and columns
- Single degree of freedom modeling
- Blast load calculation of structures based on Technical Manual UFC 3-340-02

Numerical and Experimental Methods applied to Continuum Mechanics

Credits:
6 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written and 1 oral exam

Teaching content:
This course will consist of one combined numerical-experimental project in one of the following domains:

- dynamic structural behaviour
- fluid mechanics
- vibrations

The students will

- build an experimental setup
- instrument the experimental setup using relevant measurement systems to measure e.g. pressure, displacement, strain, velocity and/or accelerations
- measure, analyze and evaluate the relevant measured variables
- build a numerical model of the setup
- simulate the model behavior
- given the experimental initial and boundary conditions
- analyze and evaluate the relevant calculated variables
- compare and discuss the numerical and experimental output
- write a report describing the:
- setup
- used measurement systems
- measurements
- numerical model
- simulation results
- comparison between measured and simulated results

Ageing of Systems

Credits:
3 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Teaching content:

- Introduction to failure analysis of components
- Overview of the different material degradation mechanisms
- Elements of Fracture Mechanics
- Single load fractures (shear and cleavage mode)
- Residual stresses
- Brittle fracture
- Ductile fracture
- Fatigue fracture
- Wear failure
- Corrosion failures
- High temperature failure
- Fractography
- Introduction to nondestructive testing
- Methodology for conducting a practical failure analysis

Mechanical Systems Integration

Credits:
3 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written exam

Autonomous Systems

Credits:
3 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written exam

Performance and Stability of Fixed Wing Aircraft

Credits:
4 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 written exam

Teaching content:
1. Aircraft Performance
1.1. Performance parameters: Coventions, Forces, Fundamental parameters, Governing equations
1.2. Steady flight: Symmetric flight, Parameters affecting performance curves, Climbingperformance, Descending performance
1.3 Accelerated flight: Accelerated straight level flight, Load factor, Turning flight, Acceleratedclimbs, Total energy, Flight envelope, Takeoff, Landing
2. Aircraft Stability:
2.1. Static stability and control
2.2. Equations of motion
2.3. Stability derivatives

2.4. Dynamic stability
2.5. Control response
2.6. Introduction to enhanced stability

Air Vehicle Technology

Credits:
2 ECTS

Type of Class:
Integrated class, exercises and visit

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Teaching content:
"1. Wings, high-lift devices, and control surfaces,
2. Aeroelasticity (wing divergence and aileron reversal),
3. Fuselage aerodynamics and structure,
4. Fan/Propeller/Rotor aerodynamics and structure,
5. On-board systems (ECS, APU/EPU, hydraulic system, electric system, fuel system,...),
6. Supersonic flight."

Ship Stability and Performance

Credits:
6 ECTS

Type of Class:
Integrated class, exercises and visit

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
2 written evaluations, 1 oral exam

Teaching content:
1. Static Stability
- Stability of the floating body
- Stability of the intact ship
- Stability computations
- Stability curves
- Moving, loading and unloading weights
- The problem of mobile cargo
- Hull damage
- Grounding
- Docking
- The inclining experiment
- Stability regulations

2. Dynamic stability
- Modeling waves
- Ship motions
- Damping installations
- Seakeeping experiments

3. Ship resistance
- The towing tank experiment
- Numerical approximation

4. Propulsion system

Land Vehicle Performance and Stability

Credits:
6 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
2 written evaluation, 1 written and 1 oral exam

Teaching content:
1. Vehicle design and mobility
- classification, mobility requirements, geometry, safety, vehicle design

2. Mechanics of tires
- Tire terminology
- Rim characteristics
- Tire characteristics
- On-road longitudinal tire dynamics
- Off-road longitudinal tire dynamics
- Lateral tire dynamics
- Interaction between longitudinal and lateral forces
- Vertical properties of tires

3. Propulsion
- On road vehicle propulsion
- Off road vehicle propulsion
- Prime movers
- Power transmission (gearbox, differential, ASR)

4. Braking
- Braking performance
- Braking stability
- Brake proportioning
- ABS, EBD,...

5. Suspensions
- Axle kinematics
- The most common suspensions
- Bounce and pitch motion
- Vehicle roll
- Vertical dynamics

6. Vehicle handling
- Low speed steering
- High speed steering
- ESC

Structural Analysis and Finite Elements

Credits:
5 ECTS

Type of Class:
Integrated class

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
1 written exam

Design of Steel Structures

Credits:
5 ECTS

Type of Class:
Integrated class

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
1 written exam

Design of concrete structures

Credits:
5 ECTS

Type of Class:
Integrated class

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
1 written exam

Geotechnical engineering

Credits:
5 ECTS

Type of Class:
Integrated class

To be covered in:
Ma 2 POL International Semester 1 and additional participants

Evaluation:
1 written exam

Master Thesis Supervisor

Credits:
12 ECTS

Type of Class:
Integrated classs

To be covered in:
Ma 2 POL International Semester 2 and additional participants

Evaluation:
1 written exam

Master Thesis 2nd Supervisor

Credits:
8 ECTS

Type of Class:
Integrated class

To be covered in:
Ma 2 POL International Semester 2 and additional participants

Evaluation:
1 written exam

Master Thesis Jury

Credits:
4 ECTS

Type of Class:
Integrated class

To be covered in:
Ma 2 POL International Semester 2 and additional participants

Evaluation:
1 written exam

Cyber Defense

Credits:
6 ECTS

Type of Class:
Integrated class

To be covered in:
Ma 2 POL International Semester 2 and additional participants

Evaluation:
2 written evaluations, 1 written exam

Aircraft Propulsion

Credits:
3 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 2 POL International Semester 2 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Teaching content:

- Introduction
- Thrust and Efficiency
- Turbojet Engines
- Turbofan Engines
- Turboprop and Turboshaft Engines
- Engine Performance
- Subsonic and supersonic inlets
- Exhaust nozzles and afterburners

Performance and Stability of Rotary Wing Aircraft

Credits:
3 ECTS

Type of Class:
Integrated class

To be covered in:
Ma 2 POL International Semester 2 and additional participants

Evaluation:
1 written evaluation, 1 written exam

Teaching content:
The hovering helicopter, Factors affecting hover, The vertical flight, Momentum theory of forward flight, The blade element method in forward flight, Performance estimates, Performance characteristics, Rotor flapping characteristics, Trim and static stability, Main rotor design considerations, Airfoils for rotor blades, Anti-torque systems, Empennages and wings, Preliminary design, Other configurations, Helicopter noise, Helicopter vibration, Helicopter accidents

Naval Ship Technology

Credits:
3 ECTS

Type of Class:
Integrated class, exercises and visit

To be covered in:
Ma 2 POL International Semester 2 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Teaching content:

- “Theory: spiral of a ship´s design
- Requirements
- Functionality analysis
- Types of platforms
- Displacement
- Hullform
- Stability
- Seakeeping
- Propulsive power
- Structure - Beam girder approximation
- Armament
- Crew
- Overall plan
- Zoning
- Auxiliaries
- Regulatory Implications
- Vulnerability and signatures

Practice: realization of a preliminary design/sizing project of a group of systems of a ship.
Visit: visiting a shipyard is the embodiment of all topics in this course and allows to gain insight inthe complexity of a ship.
Guided questions & answers sessions
Quick assessments (graded)

Ship Propulsion

Credits:
3 ECTS

Type of Class:
Integrated class, exercises and visit

To be covered in:
Ma 2 POL International Semester 2 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Teaching content:
"1 The Propeller Screw
Blade Shape, Blade Section Shape
- 2 Theory of Propeller Action
  Propeller Forces, Theory of Propeller Action, Screw Operating Conditions, Propeller-HullInteraction, Propulsive Efficiency

3 Cavitation,
4 Secondary Forces
5 Ducted Propellers
- 6 Hull-Propeller-Engine Matching
  Propeller design point PD, Engine layout diagram
  Standard load diagram, Limits to continuousoperation, Recommendation, Extended engine load diagram, Propeller-Engine matching

7 Propulsion System Selection
- Selection and dimensioning of the source, Selection of a transmission, Combined types, Hybridtypes, Fixed or controllable pitch propellers

8 Induction motors"

Energy Performance of Buildings

Credits:
6 ECTS

Type of Class:
Integrated class

To be covered in:
Ma 2 POL International Semester 2 and additional participants

Evaluation:
1 written exam

Land Vehicle Technology

Credits:
3 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 2 POL International Semester 2 and additional participants

Evaluation:
1 written exam, 1 oral exam

Teaching content:
Based on the specs of a 'new purchased' vehicle following aspects will be studied
- Engine modeling
- Vehicle performance on soft soil
- Obstacle crossing
- Maneuverability
- Gradeability
- The drive line of a 4x4 vehicle
- Start-up devices
- Differentials

Fire Control

Credits:
3 ECTS

Type of Class:
Integrated class and exercises

To be covered in:
Ma 2 POL International Semester 2 and additional participants

Evaluation:
1 written evaluation, 1 oral exam

Teaching content:
Application of trajectory modeling in order to create practical Fire Control Systems. After defining general principles, different aspects such as aiming techniques and weaponeering areanalyzed for direct and indirect fire applications.
Specific weapon systems requiring dedicated solutions are then studied.