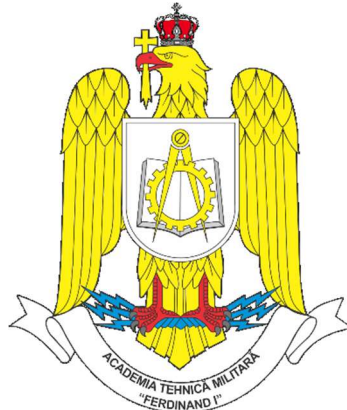


ROMANIA
MINISTRY OF NATIONAL DEFENCE
MILITARY TECHNICAL ACADEMY
“FERDINAND I”



FACULTY A
Faculty of Integrated Armament Systems, Military Engineering
and Mechatronics



DEPARTMENT OF CIVIL ENGINEERING, MILITARY
ENGINEERING AND GEOMATICS DEPARTMENT (A2)

SHORT DESCRIPTION OF DEPARTMENT

Main goals:

- training of engineer officers and specialists required from the country and abroad for the designing, manufacturing, maintenance and use of engineering techniques and munitions, constructions and fortifications, and topographic, as well as for managing the military technical and economic activities;
- specialization and training of military and civilian specialists through postgraduate education;
- scientific research in specific areas.

Undergraduate degree programmes:

1. Constructions and Fortifications
2. Roads, Bridges and Military Infrastructures
3. Technical Systems for Landmine Barriers, Destruction and Camouflage
4. Topographic and Topographic Support Automation (Geomatics)



Postgraduate courses and programmes:

- Imint/Geoint Analysis and Exploitation
- Fire Safety of Buildings and Installations



Fields of interest

A. Civil Engineering

1. Determination of material characteristics by destructive and non-destructive testing
2. Design of structural elements under static and dynamic loads
3. Efficient design of structures for civil and military buildings

Responsible: Lt. col. PhD eng. Cătălin BACIU

B. Military Engineering

1. Characterization of the action of explosions on structures and personnel
2. Assessing the potential for the emergence and spread of the progressive collapse of constructions
3. Transmitting the shock wave between two environments. Detonation by sympathy

Responsible: Col. PhD eng. Marin LUPOAE

4. Protection of facilities (vehicles, buildings, installations) against explosion
5. Intervention robots in harsh environments

Responsible: Lt. col. PhD eng. Daniel CONSTANTIN

C. Geodetic Engineering

6. IMINT/GEOINT Analysis and Exploitation
7. SAR Imagery Processing and Analysis
8. Terrain Analysis and GIS Applications

Responsible: Col.(ret) PhD eng. Dan RĂDUCANU



UNDERGRADUATE DEGREE PROGRAMMES

A. Constructions and fortifications – Romanian Language

1st year

<i>No.</i>	<i>Subject</i>	<i>ECTS points</i>
1	Mathematical Analysis	4+4
2	Algebra, Analytic and Differential Geometry	4+3
3	Techniques and Computer Programming Languages	4
4	Physics	4
5	Chemistry	2
6	Technical Drawing and Infographics - I	3
7	Applied Informatics	3
8	Probability Theory and Mathematical Statistics	3
9	Topography	4
10	Elements of Architecture	2
11	Mechanics	3
12	Strength of materials - I	4
13	Building materials	3
14	Intership - I	3
15	English (General Scientific Terminology)	3
16	French (General Scientific Terminology)	2
17	Physical Training and Sport	1+1

2nd year

<i>No.</i>	<i>Subject</i>	<i>ECTS points</i>
1	Special Mathematics	4
2	Numerical Methods	3
3	Technical Drawing and Infographics - II	4
4	Statics and Stability of Structures	5+5
5	Strength of materials - II	4
6	Geology	3
7	Plain Concrete and Reinforced Concrete	4+4
8	Hydraulics	2
9	Theory of Elasticity and Plasticity	3
10	Physics of Constructions	3
11	Dynamics of Constructions	4
12	Geotechnics	4
13	Intership - II	3
14	English (Specialty Technical Terminology)	3
15	French (Specialty Technical Terminology)	2
16	Physical Training and Sport	1+1

3rd year

<i>No.</i>	<i>Subject</i>	<i>ECTS points</i>
1	Foundations	5
2	Finite Elements Method	4
3	Installation for Constructions	3
4	Machinery for Constructions	3
5	Safety of Constructions	2
6	Reinforced Concrete Structures	5+4
7	Civil buildings	4+4
8	Communication routes / Roads	3
9	Hydro-structures	3
10	Seismic Engineering	4
11	Wood Constructions	3
12	Steel Structures - I	4
13	Masonry Structures	3
14	Intership - III	3
15	Communications, Public Relations and Negotiation Techniques	2

4th year

<i>No.</i>	<i>Subject</i>	<i>ECTS points</i>
1	Fire Safety for Buildings	4
2	Construction Management	2+2
3	Computer Aided Design for Structures	5+4
4	Steel Structures - II	5
5	Bridges	4
6	Underground Constructions	4
7	Building Technologies	5+3
8	Controlled Demolition of Structures	3
9	Administration of Real Estate Patrimony	2
10	Shelters and Fortifications	3
11	Management of Technical Systems During the Life Cycle	2
12	Intership - IV	3
13	Economy / Accountancy	1
14	Environmental Protection / Public Acquisitions	1

B. Roads, bridges and military infrastructures – Romanian Language

1st year

No.	Subject	ECTS points
1	Mathematical Analysis	4+3
2	Algebra, Analytic and Differential Geometry	4+2
3	Techniques and Computer Programming Languages	3
4	Physics	4
5	Chemistry	2
6	Technical Drawing and Infographics - I	2+2
7	Applied Informatics	3
8	Probability Theory and Mathematical Statistics	3
9	Topography	4
10	Elements of Architecture	2
11	Mechanics	3
12	Strength of materials - I	4
13	Building materials	3
14	Intership - I	3
15	English (General Scientific Terminology)	1+2
16	French (General Scientific Terminology)	1+1
17	Physical Training and Sport	2
18	Communications, Public Relations and Negotiation Techniques	2

2nd year

No.	Subject	ECTS points
1	Special Mathematics	4
2	Numerical Methods	4
3	Computer-Aided Graphics	3
4	General Management	2
5	Statics of Structures	5+5
6	Strength of materials - II	4
7	Theory of Elasticity and Plasticity	3
8	Plain Concrete and Reinforced Concrete	5+5
9	Hydraulics	2
10	Geology	3
11	Communication routes / Roads	2
12	Dynamics and Stability of Constructions	4
13	Physics of Constructions	3
14	Geotechnics	4
15	Intership - II	3
16	English (Specialty Technical Terminology)	2

3rd year

<i>No.</i>	<i>Subject</i>	<i>ECTS points</i>
1	Logistics	3
2	Foundations for roads and bridges	4
3	Seismic Engineering	4
4	Civil buildings	3
5	Finite Elements Method	3
6	Machinery for Constructions	3
7	Safety of Constructions / Statistical analysis of construction behavior	3
8	Railways	4
9	Concrete bridges	5+6
10	Special military bridges	3
11	Roads and military infrastructures - I	5
12	Hydro construction	3
13	Metallic bridges - I	4
14	Wood bridges	3
15	Intership - III	3
16	Economy / Accountancy	1

4th year

<i>No.</i>	<i>Subject</i>	<i>ECTS points</i>
1	Theory of decision	2+3
2	Computer Aided Design for Roads and Bridges	4+3
3	Construction Management	3
4	Economy for Constructions	3
5	Metallic bridges - II	5
6	Military platforms and runways	5
7	Building Technologies for Roads and Bridges	3
8	Tunnels and Underground Constructions	3
9	Controlled Demolition of Structures	2+2
10	Roads and Bridges Maintenance / Railways Maintenance	2
11	Shelters and Fortifications	3
12	Traffic Engineering / Special Foundations	2
13	Management of Technical Systems During the Life Cycle	2
14	Intership - IV	3
15	Project Management / Public Acquisitions	2

C. Technical Systems for Landmine Barriers, Destruction and Camouflage – Romanian Language

1st year

No.	Subject	ECTS points
1	Mathematical Analysis	4+4
2	Algebra, Analytic and Differential Geometry	4+3
3	Techniques and Computer Programming Languages	4
4	Physics	4
5	Chemistry	4
6	Technical Drawing and Infographics - I	3+3
7	Applied Informatics	3
8	Probability Theory and Mathematical Statistics	3
9	Study and Technology of Materials	4
10	Mechanics and Mechanical Vibrations - I	3
11	Electrotechnics and Electrical Machines	3
12	Mechanical Processing and Dimensional Control	3
13	Intership - I	3
14	English (General Scientific Terminology)	3
15	French (General Scientific Terminology)	2
16	Physical Training and Sport	1+1

2nd year

No.	Subject	ECTS points
1	Special Mathematics	4
2	Numerical Methods	3
3	Mechanics and Mechanical Vibrations - II	3
4	Mechanisms and Fine Mechanics Issues	4+4
5	Strength of Materials	4+4
6	Thermodynamics	4
7	Explosives and Special Combustibles Chemistry	4
8	Fundamentals of Mining, Destruction and Camouflage	4
9	Explosion Theory	4
10	Fluid Mechanics	3
11	Electronics and Automatics	2
12	Kinematics and Dynamics of Mining and Demining Machines	4
13	Intership - II	3
14	English (Specialty Technical Terminology)	3
15	French (Specialty Technical Terminology)	3
16	Physical Training and Sport	1+1

3rd year

<i>No.</i>	<i>Subject</i>	<i>ECTS points</i>
1	Fundamentals of engineering Machines	5+3
2	Computer-Aided Engineering	4+3
3	Basics of Logistics	3
4	Finite Element Method	3
5	Engineering Ammunition	5+5
6	Technical Facilities for Execution, Survey and Clearance of Minefield	4
7	Initiation of Engineering Ammunition	4+4
8	CBRN Protection	3
9	Camouflage Engineering Facilities	3
10	Ballistic Protection Systems	3
11	Intership - III	3
12	Communications, Public Relations and Negotiation Techniques	2

4th year

<i>No.</i>	<i>Subject</i>	<i>ECTS points</i>
1	Engineering System Logistics	4
2	Management of Technical and Economic Military Activities	3
3	Robotics for Mining and Demining	6
4	Usage of Explosives and Engineering Ammunition	5
5	Engineering Machines Maintenance	3
6	Neutralization and Destruction of Munitions and Explosives Devices	4
7	Testing and Evaluation of Military Technical Means	4
8	Structures for Military and Civil Buildings	2
9	Techniques of Disposing for Munitions and Weapons Systems	3
10	Controlled Demolition of Structures	4
11	Unconventional Explosive Systems	3
12	Integrated Weapon Systems	2
13	Methods of Analysis and Identification of Military Interest Compounds	3
14	Management of Technical Systems During the Life Cycle	2
15	Intership - IV	3
16	Economy / Accountancy	1
17	Project Management / Public Acquisitions	1

D. Topogeodesy and Topogeodetic Support Automation (Geomatics) – Romanian Language

1st year

<i>No.</i>	<i>Subject</i>	<i>ECTS points</i>
1	Mathematical Analysis	4+4
2	Algebra, Analytic and Differential Geometry	4+3
3	Techniques and Computer Programming Languages	5
4	Physics	4
5	Chemistry	3
6	Technical Drawing and Infographics	3
7	Descriptive Geometry	4
8	Probability Theory and Mathematical Statistics	3
9	Topography - I	6+5
10	Geodetic Instruments and Measurement Methods	4
11	Intership - I	3
12	English (General Scientific Terminology)	3
13	French (General Scientific Terminology)	2
14	Physical Training and Sport	1+1

2nd year

<i>No.</i>	<i>Subject</i>	<i>ECTS points</i>
1	Special Mathematics	4
2	Numerical Methods	3
3	Applied Informatics	3
4	Theory of Geodetic Measurements	5
5	Geodesy / National and local geodetic networks	4+4
6	Cartography	4
7	Civil Buildings	3
8	Topography - II	4
9	Compensation of measurements	3
10	The Geometrical Basis of Photogrammetry I	6
11	Computer Systems in Terrestrial Measurements / Geodetic Databases	3
12	Geographical Information Systems - I	2
13	Intership - II	3
14	English (Specialty Technical Terminology)	3
15	French (Specialty Technical Terminology)	2
16	Physical Training and Sport	1+1

3rd year

<i>No.</i>	<i>Subject</i>	<i>ECTS points</i>
1	Ellipsoidal Geodesy	5
2	Geographical Information Systems - II	5
3	Gravimetric Geodesy	4
4	Cadaastre	4
5	Organization of Territory and Ecology / Basis of Logistics	3
6	SIG Programming Languages	5
7	Numerical Modeling of the Land	6+4
8	Map compilation and editing technology	6
9	Photogrammetry 3D	6+4
10	Modeling and Analysis of Geospatial Databases	3
11	Intership - III	3
12	Communications, Public Relations and Negotiation Techniques	2

4th year

<i>No.</i>	<i>Subject</i>	<i>ECTS points</i>
1	Geometric Representations of Topographic Surfaces / The Theory of Form Recognition	4
2	Management of Military Technical and Economic Activities	3
3	Geodetic Measurements by Wave / Aerospace Remote Sensing	3
4	Territory planning and urban planning	3
5	Digital Photogrammetry	6
6	Digital Cartography / Computer-Aided Design and Implementation of Maps	5+3
7	Design of Applications for Geographic Information Systems	4+3
8	Space Geodesy and GPS Technologies	4
9	Earth Observation Image Analysis	3
10	Radargrammetry	3
11	Administration and Development of Database Applications	
12	Management of Technical Systems During the Life Cycle	2
13	Intership - IV	3
14	Economy / Accountancy	1
15	Project Management / Public Acquisitions	1