

## Educational Direction: Communication and Computer Engineering

**M.Sc. Programme: “Aerospace Engineering and Communications” (on English) (in two modules)**

Form of Education: [full time; regular form](#), Duration: [3 Terms \(1.5 years\)](#)

Course	ETCS credits	Exam or ongoing assessment (E/OA)	Total Hours Lectures Seminars; Practical Exercises (L + S + P)
<b>FIRST YEAR</b>			
<b><u>MODULE 1 “Aerospace Engineering (small aerospace apparatus)” (M1)</u></b>			
<b>First Term (winter) M1</b>			
<b>Introductory Compulsory Courses for M1</b>			
Basic Principles of Mission Design with Small Aerospace Vehicles	5	E	30 + 30 + 0
<b>Introductory Selectable Courses – 1 course with 5 ECTS credits (1/5)</b>			
Space Physics	5	E	45 + 30 + 0
Modern Physics for Engineers	5	E	60 + 0 + 0
<b>Common Compulsory Courses</b>			
Fixed and Mobile Satellite Communication Systems	5	E	30 + 15 + 15
Computer Practice in Communication Networks and Protocols	5	T	0 + 0 + 45
<b>Compulsory Courses for M1</b>			
Aerodynamics and Orbital Dynamics	5	E	30 + 30 + 0
Satellite Systems and Satellite information	5	E	45 + 15 + 0
<b>Second Term (summer) M1</b>			
<b>Common Compulsory Courses</b>			
Microprocessors for Aerospace Applications	5	E	30 + 0 + 30
<b>Compulsory Courses for M1</b>			
Navigation and Telemetry of Small Aerospace Apparatus	5	E	30 + 15 + 15
Photovoltaic Systems and Power Sources in Aerospace Apparatus	5	E	30 + 15 + 15
<b>Selectable Courses for M1 – 3 courses with 15 ECTS credits (3/15)</b>			
Cosmic Impact on the Environment	5	E	45 + 0 + 15
Vacuum Technique and Technology	5	E	30 + 0 + 30
Analysis, Interpretation and Application of the Satellite Images	5	T	15 + 45 + 0

Unmanned Aircrafts	5	T	30 + 30 + 0
University Micro- and Nano-Satellites and Applications	5	E	45 + 15 + 0
Software Tools for Aerospace Engineering	5	E	0 + 15 + 45
Aerospace Control Systems	5	E	30 + 30 + 0
Management of Innovations	5	T	30 + 30 + 0
Management of Aerospace Vehicles and their Applications	5	T	30 + 30 + 0
One-Term Course in Advanced Topics of Aerospace Engineering (summer)	5	T	30 + 30
<b>Optional Courses</b>			
English language (payable separately by the students)			
Russian language (payable separately by the students)			
Bulgarian language (payable separately by the students)			
<b><u>MODULE 2 “Wireless and Satellite Communications” M2</u></b>			
<b>First Term (winter) (M2)</b>			
<b>Introductory Compulsory Courses for M2</b>			
Applied Electrodynamics for MSc. Students	5	E	30 + 15 + 15
<b>Introductory Selectable Courses – 1 course with 5 ECTS credits (1/5)</b>			
Introduction to Wireless Communications	5	E	30 + 30 + 0
Modern Physics for Engineers	5	E	60 + 0 + 0
<b>Common Compulsory Courses</b>			
Fixed and Mobile Satellite Communication Systems	5	E	30 + 15 + 15
Computer Practice in Communication Networks and Protocols	5	T	0 + 0 + 45
<b>Compulsory Courses for M2</b>			
Modulations and Coding in the Digital Communications	6	E	45 + 15 + 15
Microwave and Wireless Technique	5	E	45 + 15 + 15
<b>Second Term (summer) (M2)</b>			
<b>Common Compulsory Courses</b>			
Integrated Circuits	5	E	30 + 0 + 30

<b>Compulsory Courses for M2</b>			
Antennas for Wireless Communication Systems	5	E	30 + 15 + 15
Operational Systems and Open-Source Applications in the Communications	5	T	30 + 0 + 30
<b>Selectable Courses for M2 – 3 courses with 15 ECTS credits (3/15)</b>			
Security of the Communication Networks and Systems	5	E	30 + 30 + 0
Optical Networks and Devices	5	E	45 + 15 + 0
Radio-Frequency Identification Devices (RFID's)	5	E	30 + 15 + 15
Electromagnetic Compatibility in Communications	5	E	30 + 15 + 15
Management of Innovations	5	T	30 + 30 + 0
One-term Course in Advanced Topics in Communications (summer)	5	T	30 + 30
<b>Optional Courses</b>			
English language (payable separately by the students)			
Russian language (payable separately by the students)			
Bulgarian language (payable separately by the students)			
<b>SECOND YEAR</b>			
<b><u>MODULE 1 “Aerospace Engineering (small aerospace apparatus)” (M1)</u></b>			
<b>Third Term (winter) M1</b>			
<b>Selectable Courses for M1 – 2 courses with 10 ECTS credits (2/10)</b>			
Optical Instruments and Optical Technologies	5	T	30 + 15 + 15
Plasma and Plasma Propulsion Generators for Satellites	5	E	30 + 15 + 15
Modern Electromagnetic Materials and Electronic Devices	5	E	30 + 15 + 0
One-Term Course in Advanced Topics of Aerospace Engineering (winter)	5	T	30 + 30
<b>Optional Courses</b>			
English language (payable separately by the students)			
Russian language (payable separately by the students)			
Bulgarian language (payable separately by the students)			

<b>Compulsory M.Sc. Thesis</b>			
<b>M.Sc. Thesis</b>	<b>15</b>	<b>Defense of M.Sc. Thesis: February (1<sup>st</sup>) / July (2<sup>nd</sup>)</b>	
<b>Selectable Practice for M1</b>			
Educational Practice in Aero-Space Engineering	-	T	75
Individual Preparation of the M.Sc. Thesis ( <i>instead of the practice</i> )	-	T	75
<b><u>MODULE 2 “Wireless and Satellite Communications” M2</u></b>			
<b>Third Term (winter) (M2)</b>			
<b>Selectable Courses for M2 – 2 courses with 10 ECTS credits (2/10)</b>			
Communication and Information Systems for Data Transfer	5	E	30 + 30 + 0
Mobile Radio-Channels	5	E	30 + 30 + 0
Microwave Measurements in Communications	5	E	30 + 0 + 30
Practical Programming on Visual C++	5	T	30 + 0 + 30
Wireless Networks and Protocols	5	E	45 + 15 + 0
Management of the Communication Networks	5	T	30 + 30 + 0
One-Term Course in Advanced Topics of Communications (winter)	5	T	30 + 30
<b>Optional Courses</b>			
English language (payable separately by the students)			
Russian language (payable separately by the students)			
Bulgarian language (payable separately by the students)			
<b>Compulsory M.Sc. Thesis</b>			
<b>M.Sc. Thesis</b>	<b>15</b>	<b>Defense of M.Sc. Thesis: February (1<sup>st</sup>) / July (2<sup>nd</sup>)</b>	
<b>Selectable Practice for M1</b>			
Educational Practice in Wireless and Satellite Communications	-	T	75
Individual Preparation of the M.Sc. Thesis ( <i>instead of the practice</i> )	-	T	75
<b>Total: 90 ECTS credits for each module; 10 Exams (E); 5 3 Ongoing Assessments (OE)</b>			