

**STUDY PROGRAM:** Wireless and Mobile Communications (WMC)

**Duration:** 1 year

**ECTS points:** 60 ECTS

**Degree:** Master of Science in Electrical Engineering and Information Technologies with Major in Wireless and Mobile Communications

**OBJECTIVES:**

Modern human being has a need to exchange information at any time and any place. Nowadays, every person carries some kind of wireless mobile telecommunication device, such as a smart phone or a tablet computer. There is also an ever increasing need of communication between different devices, without human interaction, such as wireless sensor devices, which are deployed throughout the living environment.

Massive use of wireless and mobile devices is possible only if a wireless telecommunication infrastructure of the latest generation is deployed. The existence of such an infrastructure has a strategic importance for the development of the information society. Besides that, the radio frequency spectrum is an important factor in any economy based on electronic communications - so called "wireless economy", which is stimulated by the development of the new mobile services, broadband wireless internet access and digital broadcasting.

This study program enables the potential candidates to get a profound knowledge of modern wireless and mobile communication systems, line of sight systems, terrestrial and satellite systems, mobile cellular systems, optical communication systems, microwave systems, and information and communication technologies in general.

The future graduate will have an opportunity for a successful career as a member of a team, developer, researcher, or consultant in a company, organization or institution in the field of telecommunications, information and communication technology, industry, business, transportation, energy, medicine, ecology etc. Also, she/he will be able to get an employment in various educational and/or research institutions. The wireless and mobile communications are some of the main research areas in the modern telecommunications, and, thus, the future graduates can continue their education with enrolling into the doctoral programme in the same or related scientific area. The study programme also develops the candidate's entrepreneurial skills enabling her/him to start a new business in the area of information and communication technology.

Some of the employment opportunities include:

- Telecommunication companies and mobile operators
- Telecommunication service providers
- Broadcasting companies and cable operators
- ICT companies
- Regulatory bodies in the field of electronic communications and services
- Consulting companies
- Software companies
- Universities and other educational institutions
- Research and development organizations

The members of the Institute of telecommunications actively contribute to the latest achievements in the area of wireless and mobile communications and publish the results of their scientific work in relevant international journals and conferences. Also, they participate in numerous international scientific and applied projects. Also, the institute has established a close collaboration with numerous institutions and companies from the field of telecommunications and ICT. Within the activities of the Communications Chapter and the Information Theory Chapter of the IEEE Republic of Macedonia Section, lectures by preeminent guest lecturers have been constantly delivered, on the topics of the latest achievements and trends in the modern telecommunications.

## ORGANIZATION OF STUDIES

### 9th SEMESTER

Mandatory courses				
Code	Title	ECTS	No of classes per week	Total necessary time (hours)
FEIT10013	Advanced Wireless Communications	6	3+0+0+3	180
FEIT10012	Advanced wireless and mobile networks	6	3+0+0+3	180
FEIT10019	Radio mobile communications	6	3+0+0+3	180
	Elective course 1	6	3+0+0+3	180
	Elective course 2	6	3+0+0+3	180
<b>Total</b>		<b>30</b>	<b>15+0+0+15</b>	<b>900</b>
Elective courses				
Code	Title	ECTS	No of classes per week	Total necessary time (hours)
FEIT10001	Wireless multimedia networks	6	3+0+0+3	180
FEIT10025	Design and implementation of telecommunication services	6	3+0+0+3	180
FEIT10004	Design of telecommunication networks	6	3+0+0+3	180
FEIT10005	Experimental and development platforms in	6	3+0+0+3	180

	telecommunications			
<b>FEIT10008</b>	Cooperative Communications	6	3+0+0+3	180
<b>FEIT10009</b>	Management of multimedia networks and services	6	3+0+0+3	180
<b>FEIT10011</b>	Nanonetworks	6	3+0+0+3	180
<b>FEIT10014</b>	Advanced Internet technologies	6	3+0+0+3	180
<b>FEIT10015</b>	Advanced telecommunications networks	6	3+0+0+3	180
<b>FEIT10017</b>	OFDM and MIMO Technologies for Broadband Systems and Standards	6	3+0+0+3	180
<b>FEIT10018</b>	Application of optimization methods in wireless communications	6	3+0+0+3	180
<b>FEIT 10020</b>	Reconfigurable networks	6	3+0+0+3	180
<b>FEIT10021</b>	Communication systems simulation	6	3+0+0+3	180
<b>FEIT10022</b>	Next Generation Optical Networks	6	3+0+0+3	180
<b>FEIT10023</b>	Software Defined Networking	6	3+0+0+3	180
<b>FEIT10026</b>	Statistical signal and array processing	6	3+0+0+3	180
<b>FEIT10028</b>	Communication Protocol Engineering	6	3+0+0+3	180
<b>FEIT10029</b>	Teletraffic engineering and network planning	6	3+0+0+3	180
<b>FEIT 10030</b>	Information Theory	6	3+0+0+3	180
<b>FEIT10031</b>	Coding theory and security communications	6	3+0+0+3	180
<b>FEIT10032</b>	Research techniques applied in telecommunications	6	3+0+0+3	180

## 10th SEMESTER

Mandatory courses				
Code	Title	ECTS	No of classes per week	Total necessary time (hours)
FEIT00	Master thesis	20	0+0+0+20	600
Elective courses				
FEIT11	Research project in the field of Wireless and Mobile Communications	6	0+0+0+6	180
	Elective course from the UKIM list of available courses	4	2+0+0+2	120
<b>Total</b>		<b>30</b>	<b>2+0+0+28</b>	<b>900</b>

Suggested elective courses from the UKIM list				
Code	Title	ECTS	Number of classes per week	Total necessary time (hours)
FEIT201	Innovation and Transfer of Technologies	4	2+0+0+2	120
FEIT202	Strategic Planning for Telecom and Internet Innovations	4	2+0+0+2	120
FEIT203	Applied Support Schemes for Renewables and Energy Efficiency	4	2+0+0+2	120