

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Specification and description languages		Code 1010822121010822689
Field of study Electronics and Telecommunications	Profile of study (general academic, practical) general academic	Year /Semester 1 / 2
Elective path/specialty Computer Networks and Internet	Subject offered in: Polish	Course (compulsory, elective) elective
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 2 Classes: 1 Laboratory: 1 Project/seminars: -		No. of credits 5
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) from field
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 5 100% 5 100%
Responsible for subject / lecturer: dr hab. inż. Grzegorz Danilewicz, prof. nadzw. email: grzegorz.danilewicz@put.poznan.pl tel. +48 61 665 3908 Wydział Elektroniki i Telekomunikacji ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	She/he is familiar with the basic operation of telecommunication systems [K1_W22], she/he has knowledge on programming [K1_W09].
2	Skills	She/he can take the information from the literature and databases and other sources in Polish or English; she/he is able to integrate the information, make their interpretation, draw conclusions and justify opinions [K1_U01]. She/he can communicate in English or Polish in workplace and in other environments [K1_U02].
3	Social competencies	She/he knows the limits of their own knowledge and skills, understands the need for lifelong education [K1_K01].
Assumptions and objectives of the course: Familiarize students with the specific software used in telecommunication systems and formal methods of telecommunication software design. The use of formal languages ??for specification and description of systems in systems design.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Has knowledge about the specifics of real-time software systems. Has knowledge about the specifics of software for communicating systems. Has knowledge about the specifics of telecommunications software for small and large scale equipment - [K2_W01]		
2. Has knowledge about modeling of real-time systems using the concept of finite state machines. Has knowledge about modeling of communicating systems using communicating finite state machines. - [K2_W03]		
3. Has basic knowledge of software engineering that allows for the implementation of projects related to the planning, specification, description, implementation and testing of software - [K2_W14]		
Skills:		
1. Is able to collect and analyze technical information needed to create simple software for communicating systems, is able to present these issues in the form of short paper and presentation (in Polish or English), and participate in the discussion to follow - [K2_U02]		
2. He can use the knowledge base accumulating norms and standards for telecommunications, knowing the importance of standardization can take into account the limitations of standards in the telecommunications software design - [K2_U08]		
3. He can practically implement the selected tasks for telecommunications software design - [K2_U16]		
Social competencies:		

1. Understands the importance of communication for the development of individuals and societies, understands the evolutionary development of networks and telecommunications systems include increased needs of users in the development of telecommunications networks - [K2_K02]
2. Demonstrates responsibility and professionalism in solving technical problems - [K2_K05]
3. Is aware of the limitations of his/her current knowledge and skills; is committed to lifelong learning - [K2_K04]

Assessment methods of study outcomes

<p>Forming assessment:</p> <p>a) in the classes: on the basis of the current progress of perform the tasks</p> <p>b) in the laboratory: on the basis of preliminary questions, based on answers to questions about the material from the previous laboratory, on the basis of written reports of laboratory and based on the tests.</p> <p>Summary assessment:</p> <p>a) in the classes: based on (1) a public presentation on the topic indicated by the teacher, (2) discussions held after the presentation, (3) the form and the quality of the prepared materials.</p> <p>b) in the laboratory: based on summary test.</p> <p>c) in respect of lectures: on the basis of an oral examination.</p>
--

Course description

The specificity of telecommunications software. An introduction to formal languages ??and comparison with natural languages??. Formal description, formal specification. Protocol engineering, software engineering, telecommunications software engineering. Finite automata (FSM - finite state machines), the definitions of states and events. Formal representation of the FSM. Enhanced FSM (EFSM). Telecommunication systems as EFSM. Communicating EFSM. MSC diagrams messaging. Specification and description language - SDL. Abstract ASN.1 notation. Fundamentals of software engineering. Object-oriented modeling. Testing of telecommunications software. Standardization issues.

Specyfika oprogramowania telekomunikacyjnego. Wprowadzenie do języków formalnych i porównanie z językami naturalnymi. Opis formalny, formalna specyfikacja. Inżynieria protokołów, inżynieria oprogramowania, inżynieria oprogramowania telekomunikacyjnego. Automaty skończone (finite state machines), definicje stanów i zdarzeń. Formalne reprezentacje FSM. Rozszerzone automaty EFSM. Systemy telekomunikacyjne jako EFSM. Komunikujące się EFSM. Diagramy wymiany wiadomości MSC. Język opisu i specyfikacji SDL. Notacja abstrakcyjna ASN.1. Podstawy inżynierii oprogramowania. Modelowanie zorientowane obiektowo. Testowanie oprogramowania telekomunikacyjnego. Zagadnienia standaryzacji.

Basic bibliography:

<ol style="list-style-type: none"> 1. International Telecommunication Union (ITU-T) ?Specification and Description Language (SDL): Overview of SDL-2010?, Z.100 Recommendation 2. Ian Somerville: Software Engineering, Pearson Education Limited, 2001 3. Ian Somerville: Inżynieria oprogramowania, WNT, 2003
--

Additional bibliography:

<ol style="list-style-type: none"> 1. Stanisław Szejko, red.: Metody wytwarzania oprogramowani, Mikom, 2002 2. Grady Booch, James Rumbaugh, Ivar Jacobson: UML przewodnik użytkownika, WNT 2002 3. Miroslav Popovic: Communication Protocol Engineering, Taylor & Francis, 2006
--

Result of average student's workload

Activity	Time (working hours)
1. Lectures	30
2. Classes	15
3. Laboratory	15
4. Consultation laboratories	5
5. Consultation classes	5
6. Preparing for the laboratory	28
7. Preparing for the classes	28
8. The examination	2

Student's workload

Source of workload	hours	ECTS
Total workload	125	5

Contact hours	72	3
Practical activities	83	3