

DISCIPLINE SHEET

1. Program data

1.1 Higher education institution	Transylvania University of Braşov
1.2 Faculty	Mathematics and Computer Science
1.3 Department	Mathematics and Computer Science
1.4 Scope studies Master 1)	Computer science
1.5 Study cycle 2)	MASTERS
1.6 Study program/Qualification	Internet technologies

2. Data about the discipline

2.1 Name of the discipline	Managing Wireless Networks							
2.2 Course activities holder	Prof. Dr. Eng. Sorin-Aurel MORARU							
2.3 Seminar/laboratory/project activities holder	Prof. Dr. Eng. Sorin-Aurel MORARU							
2.4 Year of study	2	2.5 Semester	1	2.6 Type of evaluation	It is	2.7 Discipline regime	Content 3)	DC unders cored
							Obligation 3)	DI

3. Total estimated time (hours per semester of teaching activities)

3.1 Number of hours per week	4	of which: 3.2 course	2	3.3 seminar/laboratory/project	0/2/0
3.4 Total hours in the curriculum	56	of which: 3.5 course	28	3.6 seminar/laboratory/project	0/28/0
Distribution of time fund					hours
Study according to the textbook, course material, bibliography and notes					42
Additional documentation in the library, on specialized electronic platforms and in the field					42
Preparation of seminars/laboratories/projects, assignments, papers, portfolios and essays					42
tutorial					10
EXAMINATION					8
Other activities					-
3.7 Total student activity hours	144				
3.8 Total hours per semester	200				
3.9 Number of credits 5)	8				

4. Preconditions (where applicable)

4.1 curriculum	<ul style="list-style-type: none"> Basics of communication in computer networks Computer programming for distributed systems
4.2 skills	<ul style="list-style-type: none"> General and specific competencies following the undergraduate university study program Research skills at undergraduate level

5. Conditions (where applicable)

5.1 Course schedule	<ul style="list-style-type: none"> Classroom with video projector, laptop
5.2 of the seminar/laboratory/project	<ul style="list-style-type: none"> Laboratory room with educational and ICT resources: a computer network, network interconnection equipment, internet services

6. Specific skills acquired (according to the skills grid in the curriculum)

Professional skills	<ul style="list-style-type: none"> Expanding students' knowledge based on recent methodologies and technologies, already applied in the field of software development or ready to be used in the near future; Correct use of language specific to the Internet context to describe the hardware and/or software support of a particular distributed system; Developing specialized problem-solving skills to recognize the particular internet context and to be ready to develop modern applications for practical problems in different fields; Encourage the development of professional and/or research projects using recent remote solutions.
Transversal skills	<ul style="list-style-type: none"> Performing professional tasks under partial autonomy and total responsibility; Have adequate learning skills to continue their studies and develop a reflective and analytical attitude towards their professional profile.

7. Objectives of the discipline (based on the specific skills acquired)

7.1 General objective of the discipline	<ul style="list-style-type: none"> This course presents specific topics about Wireless Systems Management. After this course, the student will be able to understand a comprehensive definition of wireless systems and the context of their management. This course also provides an introduction to wireless systems management.
7.2 Specific objectives	<ul style="list-style-type: none"> Building knowledge in the field of wireless systems management viewed as a system and seen in turn in terms of specific components. Developing skills and values necessary for constructivist approaches to problems specific to wireless systems management.

8. Contents

8.1 Course	Teaching methods	Number of hours	Observations
Object-oriented design; Design integration and optimization; Embedded systems platform	Problematic reading design and development in teams group work conversation case studies	2	
Smart sensor networks; smart transducer connection; control network		4	
Wireless sensor networks; Operating systems for scalable wireless sensor networks; dynamic power management		2	
Routing in wireless sensor networks; energy steering for sensor networks		2	
Distributed Sensor Networks; Bluetooth in Distributed Sensor Networks; Bluetooth Communication and Networking		2	
Clustering techniques in wireless sensor networks; clusters in sensor networks; performance		4	
Security protocols in sensor networks; requirements; communication security		2	
Applications of wireless sensor networks; application support and communication; habitat and environmental monitoring		2	
ZigBee / IEEE 802.15.4 network examples		2	
Home automation; Security systems; Meter reading systems; Irrigation systems; Lighting control systems; Multi-zone HVAC systems; Consumer electronics: remote control		2	
Industrial Automation; Asset Management and Personnel Tracking		2	
Health; Other applications; Hotel room; Fire extinguisher access		2	
Bibliography			
[1] Borangiu, Th., Moraru, S., et al – DB2 Databases – UDB Universal DataBase. Fundamentals and Administration, Ed. Agir, Bucharest, 2006, ISBN 973-720-088-8.			
[2] Borangiu, Th., Moraru, S., et al – DB2 Databases - UDB Universal DataBase. Applications, Ed. Agir, Bucharest, 2006, ISBN 973-720-089-6.			
[3] Farahani, S., – Zigbee Wireless Networks and Transceivers, Elsevier, 2008, ISBN: 978-0-7506-8393-7			
[5] Hac, A. – Wireless Sensor Network Designs, John Wiley and Sons, Braşov, 2003, ISBN 0-470-86736-1			
[6] Merz, H., Hansemann, T., Christof Hübner, C., – Building Automation, Communication Systems with EIB/KNX, LON and BACnet, Springer, 2009, ISBN: 978-3-540-88828-4			
8.2 Seminar/laboratory/project	Teaching – learning methods	Number of hours	Observations

Object-oriented design	Problematic design and development in teams group work conversation case studies	2	
Intelligent sensor networks		4	
Wireless sensor networks		2	
Routing in wireless sensor networks		4	
Distributed sensor networks		2	
Clustering techniques in wireless sensor networks		4	
Security protocols in sensor networks		4	
Applications of wireless sensor networks		4	
ZigBee / IEEE 802.15.4 network examples		2	
Bibliography			
[1] Borangiu, Th., Moraru, S., et al – DB2 Databases – UDB Universal DataBase. Fundamentals and Administration, Ed. Agir, Bucharest, 2006, ISBN 973-720-088-8.			
[2] Borangiu, Th., Moraru, S., et al – DB2 Databases - UDB Universal DataBase. Applications, Ed. Agir, Bucharest, 2006, ISBN 973-720-089-6.			
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9. Correlating the content of the discipline with the expectations of representatives of epistemic communities, professional associations and representative employers in the field related to the program

<p>The content of this academic discipline is corroborated with the expectations of potential employers in various fields. The course follows the ACM and IEEE Curriculum Recommendations for Computer Science Studies (Computer Science 2013, Computer Engineering 2016, Information Systems 2010, Software Engineering 2014).</p> <p>The course content is dealt with accordingly with the national and European directives on professional and transversal competences (NQFHE, November 2011).</p>

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Weight of the final grade
10.4 Course	<ul style="list-style-type: none"> - Fairness - Completeness - Presentation logic 	Final evaluation by oral exam	40%
10.5 Seminar/laboratory/project	Ability to apply theoretical results and studied techniques	Active participation throughout the semester in course/seminar/laboratory activities	50%
	The ability to independently solve a laboratory task	Final evaluation through laboratory assignment	10%
10.6 Minimum performance standard			
Basic knowledge of remote process control			

This Discipline Sheet was approved in the Department Council meeting on 09/26/2024 and approved in Faculty Council meeting on 09/26/2024.

Associate Professor Dr. Ion-Gabriel STAN Dean	Assoc. Prof. Dr. Nicușor MINCULETE Department manager
Prof. Dr. Eng. Sorin-Aurel MORARU Course holder	Prof. Dr. Eng. Sorin-Aurel MORARU Laboratory owner

Note:

¹⁾ Field of study - choose one of the options: Bachelor's/Master's/Doctorate (is completed in accordance with the Nomenclature of fields and specializations/university study programs in force);

- ²⁾ Study cycle - choose one of the options: Bachelor's/Master's/Doctorate;
- ³⁾ Discipline regime (content) - choose one of the options: DF(fundamental discipline)/DD(discipline in the field)/DS(specialized discipline)/AD(complementary discipline) - for the bachelor's level;DAP (specialization discipline)/ISD(synthesis discipline)/DC underscored(advanced knowledge discipline) - for the master's level;
- ⁴⁾ Discipline regime (compulsory) - choose one of the options:DI (mandatory subject)/DO(optional subject)/DFac (optional subject);
- ⁵⁾ One credit is equivalent to 25 – 30 hours of study (teaching activities and individual study).