Syllabus

1. Data about the program of study

1.1 Institution	Technical University of Cluj-Napoca
1.2 Faculty	Automation and Computer Science
1.3 Departament	Automation
1.4 Field of study	Systems Engineering
1.5 Cycle of study	Bachelor of Science
1.6 Program of study/Qualification	Automation and Applied Informatics (English)
1.7 Form of education	Full time
1.8 Codul disciplinei	56.20

2. Data about the subject

2.1 Subject name	*Building Automation*				
2.2 Course responsible/lecturer	Lecturer Dr. Eng. Ioan Valentin Sita – Valentin.Sita@aut.utcluj.ro				
2.3 Teachers in charge of applications	Lecturer Dr. Eng. Ioan Valentin Sita – Valentin.Sita@aut.utcluj.ro				
2.4 Year of study	4	2.5 Semester	2	2.6 Assessment *(E/C/V)*	C
2.7 Type of subject	*DF – fundamental, DD – in the field, DS – specialty, DC – complementary*				DS
	DI – compulsory, DO – elective, Dfac – optional				DO

3. Estimated total time

3.1 Number of hours per week	3	din care:	Curs	2	Seminar	0	Laborator	0	Proiect	1
3.2 Number of hours per semester	42	din care:	Curs	28	Seminar	0	Laborator	0	Proiect	14

3.3 Individual study	
(a) Manual, lecture material and notes, bibliography	28
(b) Supplementary study in the library, online and in the field	14
(c) Preparation for seminars/laboratory works, homework, reports, portfolios, essays	36
(d) Tutoring	2
(e) Exams and tests	3
(f) Other activities:	0

3.4 Total hours of individual study (sum of (3.3(a)…3.3(f)))	83
3.5 Total hours per semester (3.2+3.4)	125
3.6 Number of credit points	5

4. Pre-requisites (where appropriate)

4.1 Curriculum	Control Engineering, Systems Theory, Process Modeling
4.2 Competence	Solve common problems in systems engineering by identifying the techniques, principles, and applying appropriate methods of mathematics with emphasis on numerical calculation methods.

5. Requirements (where appropriate)

5.1. For the course	N/A
5.2. For the applications/project	Mandatory attendance

6. Specific competences

6.1 Professional competences	Using automation fundamentals, methods of modeling, simulation, identification and analysis processes, computer aided design techniques.
6.2 Cross competences	N/A

7. Course objectives

7.1 General objective	Acquiring knowledge in design, programming and use in practical applications of automation systems for buildings.
7.2 Specific objectives	- Modelling systems for building automation. - Structures and algorithms for automatic control systems for building automation.

	- Designing, implementing and building automation systems programming. - Applications in research, domestic and industrial field.

8. Contents

8.1 Lecture	No.hours	Teaching methods	Notes
Introduction to building automation	2	Teaching using laptop and projector, interactive course, debate / or online on Teams platform	
Monitoring and control systems for buildings	2		
The lighting system	2		
The heating/cooling, ventilation and air conditioning	2		
Security and Safety Systems	2		
Communication Technologies used in building automation	2		
Dependencies systems	2		
Systems Integration	2		
Standards used in implementing installations	2		
Design systems for monitoring and control	2		
The implementation of systems for monitoring and control	2		
Internet technologies and their use in building automation	2		
Building automation - city level	2		
Applications - presentation of case studies	2		

Bibliography

[1] M. Ilina, "Manualul de instalații, Instalații de încălzire," Editura ARTECNO, ed., 2010

[2] S. Wang, Intelligent Buildings and Building Automation, New York: Taylor & Francis, 2009.

[3] H. Merz, T. Hansemann, and C. Hübner, Building Automation: Communication Systems with EIB KNX, LON und BACnet: Springer, 2009.

[4] J. M. Sinopoli, Smart buildings systems for architects, owners and builders: Butterworth-Heinemann, 2009.

[5] P. K. Soori, and M. Vishwas, "Lighting Control Strategy for Energy Efficient Office Lighting System Design," Energy and Buildings, 2013.

[6] D. Enache, Climatizarea clădirilor multizonale, București: Editura Conspress, 2008.

8.2 Aplications (seminar/laboratory/project)	No.hours	Teaching methods	Notes
Introduction to building automation	1	Presentation of examples, demonstrations, discussions, practical applications / or online on Teams platform	
Monitoring and control systems for buildings	1		
The lighting system	1		
The heating/cooling, ventilation and air conditioning	1		
Security and Safety Systems	1		
Communication Technologies used in building automation	1		
Dependencies systems	1		
Systems Integration	1		
Standards used in implementing installations	1		
Design systems for monitoring and control	1		
The implementation of systems for monitoring and control	1		
Internet technologies and their use in building automation	1		
Building automation - city level	1		
Projects presentation	1		

Bibliography

[1] L. Wang, S. Greenberg, J. Fiegel et al., "Monitoring-based HVAC commissioning of an existing office building for energy efficiency," Applied Energy, 2012.

[2] F. Oldewurtel, D. Sturzenegger, and M. Morari, "Importance of occupancy information for building climate control," Applied Energy, 2012.

[3] G. Duță, "Manualul de instalații, Instalații de ventilație," Editura ARTECNO, ed., 2010.

[4] F. Domnița, T. Popovici, and A. Hoțupan, Instalații de ventilare și condiționare, Cluj-Napoca: Editura U.T.PRESS, 2010.

[5] H. Kruegle, CCTV Surveillance: Video practices and technology: Butterworth-Heinemann, 2011.

[6] F. Nilsson, Intelligent network video: Understanding modern video surveillance systems: CRC Press, 2009.

9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

The topics of the courses cover the requirements of employers in the field of ICT, especially those in the field of systems engineering. Some of the methods applied in the discipline can be used in other areas.

10. Evaluation

Activity type	Assessment criteria	Assessment methods	Weight in the final grade
Course	Assessment of knowledge through a test based on the knowledge gained following participation in the course	Written exam	70%
Seminar	-	-	-
Laboratory	-	-	30%
Project	Project presentation	Practical presentation	-
Minimum standard of performance: Written exam rabk > 5 and practical presentation rank > 5			

Date of filling in: 11.06.2024		Title Firstname NAME	Signature
	Course	Lecturer dr.ing. Ioan-Valentin Sita	
	Aplications	Lecturer dr.ing. Ioan-Valentin Sita	

Date of approval by the Department of Automation Council _____	Head of Departament .... Prof.dr.ing. Honoriu VĂLEAN
Date of approval by the Faculty of Automation and Computer Science Council _____	Dean Prof.dr.ing. Mihaela DÎNȘOREANU