SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field/ Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject		Special mathematics					
2.2 Holder of the subject		Lecturer Fechete Dorina, PhD					
2.3 Holder of the academic seminar/laboratory/project		Lecturer Tripe Adela, PhD					
2.4 Year of study	1	2.5 Semester	1	2.6 Type of the evaluation	Ex	2.7 Subject regime	Fundamental Discipline

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

3.1 Number of hours per week	3	of which: 3.2 course	2	3.3 academic seminar/laboratory/project	1/-/-
3.4 Total of hours from the curriculum	42	Of which: 3.5 course	28	3.6 academic seminar/laboratory/project	14/-/-
Distribution of time					58 hours
Study using the manual, course support, bibliography and handwritten notes					20
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					10
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					16
Tutorials					5
Examinations					2
Other activities.					5

3.7 Total of hours for individual study	**58**
3.9 Total of hours per semester	**100**
3.10 Number of credits	4

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions) -
4.2 related to skills	-

5. Conditions (where applicable)

5.1. for the development of the course	
5.2.for the development of the academic seminary/laboratory/project	

6. Specific skills acquired	
Professional skills	*Proper implementation of specific fundamental knowledge of mathematics, physics, chemistry, in the field of electrical engineering*
Transversal skills	

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ Identifying notions, describing theories and using specific language ▪ Correct explanation and interpretation of mathematical concepts, using specific language ▪ Adequate identification of concepts, methods and techniques of mathematical demonstration ▪ Use of mathematical reasoning in demonstrating mathematical results
7.2 Specific objectives	▪ The student is able to practically apply the acquired theoretical knowledge.

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
1. First order differential equations: Generalities;	lecture	2
2. First order differential equations solvable by quadratures;	lecture	2
3. First order linear differential equation;	lecture	2
4. The existence and uniqueness for the Cauchy problem solution;	lecture	2
5. Approximate methods for solving differential equations.	lecture	2
6. Higher order differential equations: Generalities;	lecture	2
7. Higher order linear differential equations with variable coefficients	lecture	2
8. Higher order linear differential equations with constant coefficients	lecture	2
9. Systems of differential equations	lecture	2
10. Vector calculus identities: Gradient, Divergence and Curl	lecture	2
11. Fourier series	lecture	2
12. The complex shape of the Fourier series; Fourier Integrals and Transforms	lecture	2
13. Operational calculus; The Laplace transform	lecture	2
14. Applications of operational calculus	lecture	2

Bibliography

1. C. I. Radu, *Algebra liniara, geometrie analitica si diferentiala*, Ed. ALL, Bucuresti, 1996
2. M. Rosculet, *Algebra liniara, geometrie analitica si diferentiala*, Ed. Tehnica, 1987
3. Gh. Sabac, *Matematici speciale*, E.D.P., Bucuresti, 1981
4. V. Brinzanescu, O. Stanasila, Matematici speciale, Ed. ALL, Bucuresti, 1994
5. S. Gal, S. Scurtu, Matematici speciale, Oradea, 1998
6. Gh. Micula, P. Pavel, Ecuatii diferentiale si integrale prin probleme si exercitii, Ed. Dacia, Cluj-Napoca

8.2 Seminar	Teaching methods	No. of hours/ Observations
1. First order differential equations: Generalities;	Exercise	1
2. First order differential equations solvable by quadratures;	Exercise	1
3. First order linear differential equation;	Exercise	1
4. The existence and uniqueness for the Cauchy problem solution;	Exercise	1
5. Approximate methods for solving differential equations.	Exercise	1
6. Higher order differential equations: Generalities;	Exercise	1
7. n differential linear differential equation with variable coefficients;	Exercise	1
8. n-order linear differential equation with constant coefficients.	Exercise	1
9. Systems of differential equations	Exercise	1
10. Vector calculus identities: Gradient, Divergence and Curl	Exercise	1
11. Fourier series	Exercise	1
12. The complex shape of the Fourier series; Fourier Integrals and Transforms	Exercise	1
13. Operational calculus; The Laplace transform	Exercise	1
14. Applications of operational calculus	Exercise	1

Bibliography

7. C. I. Radu, *Algebra liniara, geometrie analitica si diferentiala*, Ed. ALL, Bucuresti, 1996

8. M. Rosculet, *Algebra liniara, geometrie analitica si diferentiala*, Ed. Tehnica, 1987
9. Gh. Sabac, *Matematici speciale*, E.D.P., Bucuresti, 1981
10. V. Brinzanescu, O. Stanasila, Matematici speciale, Ed. ALL, Bucuresti, 1994
11. S. Gal, S. Scurtu, Matematici speciale, Oradea, 1998
12. Gh. Micula, P. Pavel, Ecuatii diferentiale si integrale prin probleme si exercitii, Ed. Dacia, Cluj-Napoca

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- Training of specialists able to meet all current requirements of the labor market
- Ensuring adequate training for the study of cutting-edge fields of science and technology

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	-	Written examination	50 %
10.6 Seminar	-	Written examination	50 %
10.8 Minimum performance standard: -			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject		**Basics of economics**					
2.2 Holder of the subject		**Assoc.prof. PhD eng.ec. Liliana Doina Măgdoiu**					
2.3 Holder of the academic seminar/laboratory/project		**Assoc.prof. PhD eng.ec. Liliana Doina Măgdoiu**					
2.4 Year of study	**I**	2.5 Semester	**2**	2.6 Type of the evaluation	**Ex**	2.7 Subject regime	**FD**

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

3.1 Number of hours per week	**4**	of which: 3.2 course	**2**	3.3 academic seminar/laboratory/project	**2**
3.4 Total of hours from the curriculum	**56**	Of which: 3.5 course	**28**	3.6 academic seminar/laboratory/project	**28**
Distribution of time					69h
Study using the manual, course support, bibliography and handwritten notes					28
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					12
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					23
Tutorials					2
Examinations					4
Other activities.					

3.7 Total of hours for individual study	**69**
3.9 Total of hours per semester	**125**
3.10 Number of credits	**4**

4. Pre-requisites (where applicable)

4.1 related to the curriculum	
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- attending at least 50% of the course - the course can be held face to face or online
5.2.for the development of the academic seminary/laboratory/project	- mandatory presence at all seminar hours; - students come with observed seminar papers - a maximum of 3 seminars can be recovered during the semester (30%); - attendance at seminar hours below 70% leads to the restoration of the discipline

6. Specific skills acquired

Professional skills	**C2.** Elaborate, interpret and analyze technical, economical and managerial documents. **C3.** Companies planning, programming and management, as well as associated logistic networks, and also, follow the production
Transversal skills	CT2.Identifying the roles and responsibilities in a multidisciplinary team and applying effective relationship and work techniques within the team

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ Familiarization of students with the main types of processes and economic phenomena.
7.2 Specific objectives	▪ The course aims to present the theoretical elements of general economics ▪ The seminar acquaints the students with practical aspects regarding the economic-financial flows at business level, the management of the economic and financial phenomenon

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
Chapter 1. The object of political economy	Free exposure, with the presentation on-line	2 h
Chapter 2. The legal character of the economy	Free exposure, with the presentation on-line	2 h
Chapter 3. The economic activity	Free exposure, with the presentation on-line	2 h
Chapter 4. Economic needs and interests	Free exposure, with the presentation on-line	2 h
Chapter 5. Company	Free exposure, with the presentation on-line	2 h
Chapter 6. Consumer behavior	Free exposure, with the presentation on-line	2 h
Chapter 7. Market	Free exposure, with the presentation on-line	2 h
Chapter 8. Economic competition	Free exposure, with the presentation on-line	2 h

Chapter 9. Selling prices	Free exposure, with the presentation on-line	2 h
Chapter 10. Income, Consumption and the saving process	Free exposure, with the presentation on-line	2 h
Chapter 11. Economic growth	Free exposure, with the presentation on-line	2 h
Chapter 12. The profit of the entrepreneur	Free exposure, with the presentation on-line	2 h
Chapter 13. Cyclicality of economic activities	Free exposure, with the presentation on-line	2 h
Chapter 14. Relations with the international market	Free exposure, with the presentation on-line	2 h
Total		28 h

Bibliography

1. Rada, Ioan Constantin, **Economie**, Ed. Anotimp, 2002
2. Rada, Ioan Constantin; Rada, Ioana Carmen, **Economie. Caiet de lucrări**, Ed. Anotimp & Adsumus, 2002
3. Rada, Ioan Constantin; Bodog, Simona;Rada, Ioana Carmen; Lăzurean, Elena Nicoleta, **Economie generală, Marketing industrial (note de curs)**, Ed. Universităţii Oradea, 2006
4. Rada, Ioan Constantin; Bodog, Simona;Rada, Ioana Carmen; Lăzurean, Elena Nicoleta, **Economie generală, Marketing industrial (aplicaţii pentru seminar)**, Ed. Universităţii Oradea, 2006
5. Rada**,** Ioan Constantin, **Economie generală I**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2009,CD-ROM
6. Rada**,** Ioan Constantin, **Economie generală II**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2009,CD-ROM
7. Rada, Ioan Constantin, **Microeconomie. Idei moderne. Vol. I**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2007
8. Rada, Ioan Constantin, **Microeconomie. Idei moderne. Vol. II**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2008
9. Rada, Ioan Constantin; Rica, Ivan; Măgdoiu**,** Liliana Doina, **Finanţe şi credit (note de curs)**, Editura Universităţii din Oradea, 2011, CD-ROM
10. Rada, Ioan Constantin; Rica, Ivan; Măgdoiu, Liliana Doina**, Finanţe şi credit (aplicaţii pentru seminar)**, Editura Universităţii din Oradea, 2011, CD-ROM
11. Nagy, Ştefan; Rada, Ioan Constantin, **Sisteme avansate de producţie (note de curs)**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2008, CD-ROM
12. Nagy, Ştefan; Rada,Ioan Constantin, **Sisteme avansate de producţie (aplicaţii)**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2008, CD-ROM

8.2 Academic seminar/laboratory/project	Teaching methods	No. of hours/ Observations
1. Paper: Consumer concepts	Students receive homework for the seminar papers or choose their homework at least a week in advance, study,	4 h
2. Report: About resources		4 h
3. Paper: The concept of competition		4 h
4. Paper: The role of the environment in obtaining production factors		4 h
5. Report: The information system of the enterprise		4 h
6. Paper: Substantiation of production cost decisions		4 h
7. Report: The production price and the profit of the entrepreneur		4 h

	design the papers and present them at the seminar. Appreciations and comments are made under the guidance of the teacher.	
Total		28 h
Bibliography It is the one indicated for the course		

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline is found in the curriculum of economic engineering specialization in electrical, electronic and energy from other university centers that have accredited these specializations ("Politehnica" University of Timisoara, Technical University of Cluj-Napoca, Gh. Asachi Iasi, etc.), and knowledge the main types of processes and economic phenomena at microeconomic level, the theoretical elements of microeconomics and practical aspects regarding the economic-financial flows at business level, the management of economic and financial phenomenon is a stringent requirement of any employer in the field (Faist Mekatronics, Celestica, Comau, GMAB etc).

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods
10.4 Course	- for grade 5 it is necessary to know the fundamental notions required in the subjects, without presenting details on them - for grade 10, a thorough knowledge of all subjects is required	Written exam Students receive pre-arranged topics for solving
10.5 Seminar	- for note 5, it is necessary to know the structure of the paper and one or two notions from the paper - for grade 10, the detailed knowledge of the issue and its support during the seminar	At each seminar, the students prepare a report, which can be collective, which they support an which is submitted to the debates during the seminars. Each student also receives a grade fo the seminar activity during the semester
10.6 Minimum performance standard: Course: - Solving and explaining problems of medium complexity, associated with the discipline of microecon general economics, specific to the field of engineering and management - Participation in at least half of the courses. Seminar: - Designing economic-financial processes at business level, for a given situation		

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field/ Bachelor of Engineering**

2. Datarelated to thesubject

2.1 Name of the subject			**Elements of mechanical engineering**				
2.2 Holder of the subject			**Conf. PhD eng. Tiberiu Barabas**				
2.3 Holder of the academic laboratory/project			**Conf. PhD eng. Tiberiu Barabas**				
2.4 Year of study	**I**	2.5 Semester	**1**	2.6 Type of the evaluation	**Ex**	2.7 Subject regime	**DD**

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

3.1 Number of hours per week	**3**	of which: 3.2 course	**2**	3.3 academic laboratory/project	**1/-**
3.4 Total of hours from the curriculum	**42**	Of which: 3.5 course	**28**	3.6 academiclaboratory/project	**14/-**

Distribution of time	hours
Study using the manual, course support, bibliography and handwritten notes	24
Supplementary documentation using the library, on field-related electronic platforms and in field-related places	6
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	24
Tutorials	
Examinations	4
Other activities.	

3.7 Total of hours for individual study	**58**
3.9 Total of hours per semester	**104**
3.10 Number of credits	**4**

4. Pre-requisites(where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses - The course can be held face to face or online
5.2.for the development of the academic laboratory/project	- Mandatory presence at all laboratories; - The laboratory/project can be carried out face to face or online - Students come with the observed laboratory works - A maximum of 2 works can be recovered during the semester (30%); - The frequency at laboratory hours below 70% leads to the restoration of the discipline

6. Specific skills acquired	
Professional skills	**C1.** Make calculations, demonstrations and applications in order to solve specific engineering and management tasks, based on knowledge achieved from fundamental sciences and engineering sciences. **C2.** Elaborate, interpret and analyze technical, economical and managerial documents.
Transversal skills	**CT3.** Identify the long-life training opportunities and the efficient use (for self-development) of informational sources, as well as communication and assisted professional training resources (Internet websites, dedicated software applications, databases, on-line courses etc.) both in Romanian language and some other international spoken language.

7. The objectives of the discipline(resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	• Study and knowledge of basic elements of mechanical engineering: kinematics and dynamics of rigid solid, calculation of configuration and kinematics of some mechanisms. • Forming the technical horizon of the future specialist.
7.2 Specific objectives	• The course aims in particular at providing knowledge and methods of study for the balance and movement of material bodies; such knowledge being necessary for students to be able to design new automation installations from the point of view of their organs, of the parts in balance under the action of some types of moving forces. • The laboratory offers the skill of engineering methods to approach and solve problems related to the calculation of mechanical elements.

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
Cap1. Introductions. Cap2. Statics of the material point. Cap3. Statics of the rigid solid. Cap4. Kinematics of the material point. Cap5. Theorems and general methods in dynamics. Cap6. Structure of a mechanical system.	Free exposure, with the presentation of the course with video projector, on the board or online	2h 4h 6h 6h 6h 4h

Bibliography

1. Cornel Marin, Teodor Huidu, **Mecanică**, Editura Printech, Bucureşti, 1999.
2. Dumitru Luca, Cristina Stan, **Mecanică clasică**, Universitatea Al. I. Cuza Iaşi, 2007
3. Florescu Daniela, **Curs de mecanică tehnică**, Editura Alma mater, Bacău, 2007
4. Octavian G. Mustafa, **Elemente de mecanica punctului material şi a solidului rigid**, Universitatea din Craiova, 2002
5. Tudose, Sandu-Ville, Fl., Racocea, C., Farcas, Fl., Hanganu, L., **Organe de maşini şi inginerie mecanică** - aplicatii, Editura Gh. Asachi Iasi, 2003
6. Vlase Sorin., **Mecanica. Statica**. Ed. Infomarket, Braşov, 2008
7. Vlase Sorin., **Mecanica. Cinematica**. Ed. Infomarket, Braşov, 2007
8. Vlase Sorin., **Mecanica. Dinamica**. Ed. Infomarket, Braşov, 2005

8.2 Academic laboratory	Teaching methods	No. of hours/ Observations
1. Presentation of the laboratory and of the labor protection norms. 2. Statics of the material point. Vector operations – computer application.	Students receive laboratory papers at least one week in advance, study them, inspect them, and take a	2 h 2 h

3. Reduction of competing coplaning forces - computer application. 4. Reduction of competing spatial forces - computer application. 5. Reduction of parallel force systems - computer application. 6. Reduction of force and moment systems - computer application. 7.Closing the situation at the laboratory.	theoretical test at the beginning of the laboratory.	2 h 2 h 2 h 2 h 2 h

Bibliography

1. Teodor Huidu, Cornel Marin, **Probleme rezolvate de mecanică**, Editura Macarie, Târgovişte , 2001
2. Tiberiu Barabas, **Fascicule pentru lucrări de laborator**, Universitatea din Oradea.

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- There is strong collaboration with the economic environment in the region (Celesitica, Comau, GMAB, etc.), focused on issues and topics of interest to them.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods The evaluation can be done face-to-face oronline	10.3 Percent from the final mark
10.4 Course	Minimum required conditions for passing the exam (mark 5): in accordance with the minimum performance standard it is necessary to know the fundamental notions required in the subjects, without presenting details on them For 10:thorough knowledge of all subjects is required	**Written exam** Students receive for solving each a form with 3 subjects of theory and an application.	70 %
10.5 Laboratory	Minimum required conditions for promotion (grade 5): in accordance with the minimum performance standard recognition of the stands used to carry out the laboratory works, without presenting details on them For 10: detailed knowledge of how to perform all laboratory work	**Test + practical application** At each laboratory students receive a test and a grade. Each student also receives a grade for laboratory work during the semester and for the laboratory work file. This results in an average for the laboratory.	30%

10.6 Minimum performance standard:

- Knowledge of the basic elements in the kinematic and dynamic calculation of some components in the structure of mechanical systems.

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject				**Modern Languages – English (1)**			
2.2 Holder of the subject				**Lecturer PhD. Abrudan Caciora simona Veronica**			
2.3 Holder of the academic laboratory/project							
2.4 Year of study	**I**	2.5 Semester	**1**	2.6 Type of the evaluation	**PE**	2.7 Subject regime	**CD**

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

3.1 Number of hours per week	**1**	of which: 3.2 course		3.3 academic seminar /laboratory/project	**1**
3.4 Total of hours from the curriculum	**14**	Of which: 3.5 course		3.6 academic seminar/ laboratory/project	**14**

Distribution of time	hours
Study using the manual, course support, bibliography and handwritten notes	36
Supplementary documentation using the library, on field-related electronic platforms and in field-related places	12
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	18
Tutorials	4
Examinations	2
Other activities.	

3.7 Total of hours for individual study	**36**
3.9 Total of hours per semester	**50**
3.10 Number of credits	**2**

4. Pre-requisites (where applicable)

4.1 related to the curriculum	Basic knowledge of English
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	
5.2.for the development of the academic laboratory/project	- Mandatory presence at 80% of the seminars; - The seminar can be carried out face to face or online -

6. Specific skills acquired

Professional skills	
Transversal skills	**CT3.** Effective use of information sources and resources of communication and assisted professional training (Internet portals, specialized software applications, databases, online courses, etc.) both in Romanian and in a language of international circulation.

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	The seminar aims to be, for the students who do not have English as main subject, a means of improving the English knowledge they had acquired in high school, in order to reach the level of language competence that would alow them to understand and produce accurate academic and scientific texts in English, and understand written or verbal texts on topics related to the field of engineering in general and the specialization they have chosen, in particular. During the seminar, students are given the opportunity to produce written texts or to express themselves verbally, in English. In order to achieve these goals, the textbooks elaborated by the foreign languages team of the Department of Automated Systems Engineering and Management are used, as well as specialized books, published by well-known international publishing houses.
7.2 Specific objectives	• Acquiring field-related vocabulary in English and the completion of documents that are specific to the chosen field of study

8. Contents*

8.2 Seminar	Teaching methods	No. of hours/ Observations
Chapter 1 Introductory seminar. Test for the evaluation of students'level of English language skills.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 2. What is Engineering? Reading. Vocabulary and conversation exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 3 The plural of nouns: Revision and application exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h

Chapter 4. Engineers – Education and Specializations. Reading and vocabulary exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 5. The degrees of comparison for adjectives and adverbs (revision exercises)	Free exposure, with the presentation of the course with video projector, on the board or online	1 h
Chapter 6: Engineering Design. Technical Drawing in Engineering. Types of Views Used in Engineering Drawing.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 7: Present Tense Simple and Continuous (Revision exercises)	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 8: Computer-Aided Design and Drawing. Reading and vocabulary exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 9: The Past Tense Simple and The Past Tense Continuous (Revision and exercises).	Free exposure, with the presentation of the course with video projector, on the board or online	1 h
Chapter 10: Engineering Materials. Types of Materials and The Properties of Materials Used in Engineering. (Listening and vocabulary exercises)	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 11: The Present Perfect Tense Simple: The Present Perfect Tense Continuous. (Revision and exercises)	Free exposure, with the presentation of the course with video projector, on the board or online	1h

Chapter 12: Processes Applied to Engineering Materials. Forming Materials into Shapes. (Reading and conversation exrcises**)**	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 13: The Past Perfect Tense Simple and Continuous (Revision and exercises)	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 14: Basic Concepts Related to Electrical Engineering: the Electric Field, the Magnetic Field, Electrostatics, Electrokinetics.	Free exposure, with the presentation of the course with video projector, on the board or online	1h

References:

Abrudan Simona Veronica, Bandici Adina, *Technical English for Electrical Engineering,* Editura Universității "Lucian Blaga" din Sibiu, 2016.
Abrudan Simona Veronica, *English for Computer Science Students,* Editura Universitatii din Oradea, Oradea, 2009
Abrudan Simona Veronica, '*English Practice. A Practical Course in English for Intermediary Students*', Editura Universitatii din Oradea, Oradea 2004
Abrudan Simona, Fazecas Eniko, Anton Anamaria, Benţea Violeta, *A Practical Course In English Science and Technology* , Editura Universitatii din Oradea, Oradea 2002
Beakdwood, L, *A first Course in Technical English*, Heinemann, 1978
Fitzgerald, Patrick,ș Marie McCullagh and Carol Tabor, *English for ICT Studies in Higher Education Studies*, Garnet Education, Reading, UK, 2011.
PPP- English for Science and Technology,Cavaliotti,Bucuresti, 1999

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline can be found in the curriculum of Automatics and Applied Informatics and other university centers that have accredited these specializations (Technical University of Cluj-Napoca, University of Craiova, "Politehnica" University of Timisoara, Gh. Asachi University of Iasi, etc.) and knowledge of Technical Engish requirement of employers in the field (Comau, Faist Mekatronics, Celestica, GMAB, etc.).

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods The evaluation can be done face-to-face or online	10.3 Percent from the final mark
10.4 Seminar	Minimum required	**Written exam**	100 %

	conditions for passing the exam (mark 5): in accordance with the minimum performance standard it is necessary to know the fundamental notions required in the subjects, without presenting details on them For 10: thorough knowledge of all subjects is required	Students rare required to solve exercises, meant at testing the knwledge they acquired during the semester	
10.6 Minimum performance standard: Seminary: Capacity to use English in an appropriate way, depending on the context Capacity to produce any of the documents, written in English, presented and discussed during the seminaries Capacity to use grammatical structures accurately			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Electrical Engineering**
1.4 Field of study	**Control systems engineering**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Electrical Engineering in the Electric, Electronic and Energetic Field/ Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject			**Modern Languages – English (1I)**				
2.2 Holder of the subject			**Lecturer PhD. Abrudan Caciora simona Veronica**				
2.3 Holder of the academic laboratory/project							
2.4 Year of study	**I**	2.5 Semester	**1I**	2.6 Type of the evaluation	**PE**	2.7 Subject regime	**CD**

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

3.1 Number of hours per week	**1**	of which: 3.2 course		3.3 academic seminar /laboratory/project	**1**
3.4 Total of hours from the curriculum	**28**	Of which: 3.5 course		3.6 academic seminar/ laboratory/project	**36**

Distribution of time	hours
Study using the manual, course support, bibliography and handwritten notes	22
Supplementary documentation using the library, on field-related electronic platforms and in field-related places	11
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	11
Tutorials	4
Examinations	2
Other activities.	

3.7 Total of hours for individual study	**36**
3.9 Total of hours per semester	**50**
3.10 Number of credits	**2**

4. Pre-requisites (where applicable)

4.1 related to the curriculum	Basic knowledge of English
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	
5.2.for the development of the academic laboratory/project	- Mandatory presence at 80% of the seminars; - The seminar can be carried out face to face or online

6. Specific skills acquired

Professional skills	
Transversal skills	**CT3.** Effective use of information sources and resources of communication and assisted professional training (Internet portals, specialized software applications, databases, online courses, etc.) both in Romanian and in a language of international circulation.

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	The seminar aims to be, for the students who do not have English as main subject, a means of improving the English knowledge they had acquired in high school, in order to reach the level of language competence that would alow them to understand and produce accurate academic and scientific texts in English, and understand written or verbal texts on topics related to the field of engineering in general and the specialization they have chosen, in particular. During the seminar, students are given the opportunity to produce written texts or to express themselves verbally, in English. In order to achieve these goals, the textbooks elaborated by the foreign languages team of the Department of Automated Systems Engineering and Management are used, as well as specialized books, published by well-known international publishing houses.
7.2 Specific objectives	• Acquiring field-related vocabulary in English and the completion of documents that are specific to the chosen field of study

8. Contents*

8.2 Seminar	Teaching methods	No. of hours/ Observations
Chapter 1 Material types: Metals and non-metals. Elements, compounds and mixtures. Composite materials. Vocabulary and speaking exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter Polymers. Natural and synthetic polymers. Thermoplastics and thermosetting plastics. Reading. Vocabulary and conversation exercises. Revision of numerals.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 3: **Material properties (I). Tensile strength and deformation. Elasticity and plasticity. Stages in elastic and plastic deformation**.Vocabulary exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h

Chapter 4. Material properties (I). Hardness. Fatigue, fracture toughness and creep. Basic thermal properties. Reading and vocabulary exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 5. Interconnection: vocabulary relating to attaching and supporting and fitting together different parts, specific to the engineering domain. (revision exercises)	Free exposure, with the presentation of the course with video projector, on the board or online	1 h
Chapter 6: Mechanical fasteners (I). Bolts. Preload in bolted joints. Washers. Listening and speaking exercises. Revision: Countable and uncountable nouns.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 7: Mechanical fasteners (2). Screws. Screw anchors and rivets.. Vocabulary and speaking exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 8: Non-mechanical joints: welding, brazing, soldering, adhesives. Reading and vocabulary exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 9: Referring to types of force and deformation. The concept of failure in engineering Vocabulary and speaking exercises	Free exposure, with the presentation of the course with video projector, on the board or online	1 h
Chapter 10: Expressing numbers and calculations. Decimals and fractions. Addition, subtraction, multiplication and division. (Listening and vocabulary exercises)	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 11: Referring to the electrical supply. Direct current and alternating current. AC generation and supply. DC generation and use.. (Reading and exercises)	Free exposure, with the presentation of the course with video projector, on the board or online	1h

Chapter 12: Referring to circuits and components. Simple circuits. Mains AC circuits and switchboards. Printed and integrated circuits. Electrica land electronic components. (Reading and conversation exrcises**)**	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 13: Referring to engines and motors. Types and functions of engines and motors. Reading and vocabulary exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 14: Referring to energy and temperature. Forms of energy. Energy efficiency. Work and power.	Free exposure, with the presentation of the course with video projector, on the board or online	1h

References:

Abrudan Simona Veronica, Bandici Adina, *Technical English for Electrical Engineering*, Editura Universității "Lucian Blaga" din Sibiu, 2016.
Abrudan Simona Veronica, *English for Computer Science Students*, Editura Universitatii din Oradea, Oradea, 2009
Abrudan Simona Veronica, '*English Practice. A Practical Course in English for Intermediary Students*', Editura Universi din Oradea, Oradea 2004
Abrudan Simona, Fazecas Eniko, Anton Anamaria, Benţea Violeta, *A Practical Course In English Science and Technolo* Editura Universitatii din Oradea, Oradea 2002
Beakdwood, L, *A first Course in Technical English*, Heinemann, 1978
Fitzgerald, Patrick,ș Marie McCullagh and Carol Tabor, *English for ICT Studies in Higher Education Studies*, Ga Education, Reading, UK, 2011.
PPP- English for Science and Technology,Cavaliotti,Bucuresti, 1999

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professio associations and representative employers in the field related to the program

- The content of the discipline can be found in the curriculum of Automatics and Applied Informatics and other university centers that have accredited these specializations (Technical University of Cluj-Napoca, University of Craiova, "Politehnica" University of Timisoara, Gh. Asachi University of Iasi, etc.) and knowledge of Technical Engish requirement of employers in the field (Comau, Faist Mekatronics, Celestica, GMAB, etc.).

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods The evaluation can be done face-to-face or online	10.3 Percent from the final mark

10.4 Seminar	Minimum required conditions for passing the exam (mark 5): in accordance with the minimum performance standard it is necessary to know the fundamental notions required in the subjects, without presenting details on them For 10: thorough knowledge of all subjects is required	Written exam Students rare required to solve exercises, meant at testing the knwledge they acquired during the semester	100 %
10.6 Minimum performance standard: Seminary: Capacity to use English in an appropriate way, depending on the context Capacity to produce any of the documents, written in English, presented and discussed during the seminaries Capacity to use grammatical structures accurately			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	DEPARTMENT OF ELECTRICAL ENGINEERING
1.4 Field of study	ELECTRICAL ENGINEERING
1.5 Study cycle	Bachelor (1st cycle)
1.6 Study program/Qualification	Economic engineering on electrical, electronic and energy/ Bachelor of Engineering

2. Data related to the subject

2.1 Name of the subject				**TECHNOLOGICAL METHODS AND PROCESSES**			
2.2 Holder of the subject				**Conf.dr.ing. BANDICI LIVIA**			
2.3 Holder of the academic seminar / laboratory / project				**Şef.lucr.dr.ing. GAL TEOFIL - Laboratory**			
2.4 Year of study	I	2.5 Semester	1	2.6 Type of the evaluation	VP	2.7 Subject regime	DD

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

3.1 Number of hours per week	42	of which: 3.2 course	2	3.3 academic seminar/laboratory/project	1
3.4 Total of hours from the curriculum	42	Of which: 3.5 course	2	3.6 academic seminar/laboratory/project	1

Distribution of time	hours
Study using the manual, course support, bibliography and handwritten notes	10
Supplementary documentation using the library, on field-related electronic platforms and in field-related places	10
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	7
Tutorials	3
Examinations	3
Other activities.	-

3.7 Total of hours for individual study	**33**
3.9 Total of hours per semester	**75**
3.10 Number of credits	3

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	Video projector, computer; - The course can be held face to face or online; - Attendance: at least 50% of the courses.
5.2.for the development of the academic seminary/laboratory/project	- The laboratory can be held face to face or online; - The equipment related to the laboratory class; - Preparation of the report (synthesis material); - Carrying out all laboratory works; - The recovery of one missed laboratory is allowed; - Attendance at laboratory classes: less than 70% leads to the restoration of the discipline.
6. Specific skills acquired	

Professional skills	**C4. Using measurement techniques for electrical and non-electrical quantities and data acquisition systems in electromechanical systems** **C5. Automation of electromechanical processes** **C6. Operating, maintenance, service, system integration activities**

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ Students acquire the concepts regarding technological methods and procedures, methods of analysis and synthesis of their structure; ▪ Applying general and specialized technical knowledge to solve the logistic problems specific to the field of electrical engineering
7.2 Specific objectives	▪ Design and use of schemes, structural and functional diagrams, graphic representations and technical documents specific to the field of electrical engineering

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
1. Basic concepts of technological methods and processes 1.1. Production process 1.2. Technological process	Projector. Intercalated student contributions are requested on subject-specific topics. Some courses take place by teaching subjects and student debates.	2
1.3. Technological flow 1.4. Quality technical control 1.5. Choosing the optimal process version 1.6. Elements of technical norming in the technological process	Idem	2
1.7. Precision of part and product processing. Tolerances and adjustments 1.8. Dimensions, deviations and tolerances	Idem	2
2. Material properties 2.1. Properties of materials and tests 2.2. Physical properties 2.3. Electrical properties 2.4. Magnetic properties 2.5. Mechanical properties and tests	Idem	2
2.6. Chemical properties 2.7. Electrical properties of insulating materials 2.8. Physical-chemical properties of insulating materials 2.9. Aluminium properties 2.10. Copper properties	Idem	2
3. Materials used in industry 3.1. Materials used in machine building 3.2. Metals and alloys used in electrical engineering 3.3. Electrical insulating materials used in electrical engineering 3.3.1. Gaseous electro-insulating materials 3.3.2. Liquid electro-insulating materials	Idem	2
3.3.3. Solid organic insulating materials 3.3.4. Solid inorganic insulating materials	Idem	2
4. Methods and processes of cold machining 4.1. Methods and processes for splitting machining 4.1.1. Turning 4.1.2. Milling 4.1.3. Drilling	Idem	2
4.1.4. Planning 4.1.5.Polishing 4.1.6.Rectification	Idem	2

4.1.7. Other processing methods 4.2. Methods and processes for processing materials by cutting and cold plastic deformation 4.2.1. Cutting 4.2.2. Shaping 4.2.3. Continuous deformation		
4.2.4. Bending 4.2.5. Drawing 4.2.6. Special processing of sheets 4.3. Unconventional technologies 4.3.1. Electrical discharge machining processing	Idem	2
5. Innovative technologies in material processing 5.1. Plasma cutting technology 5.2 Friction rotation with rotating element 5.3. 2D and 3D Laser Testing 5.4. Non-destructive processing of materials 5.5. Laser processing by shock 5.6. Innovative pressing processing 5.7. Method of heating ingots using superconducting magnets	Idem	2
5.8. Nanotechnology 5.9. Water jet cutting 5.10. Pipe welding technology in a hyperbaric environment 5.11. Bionanotechnology 5.12. Technology of material processing by solidification with phase change surface control 5.13. Graphene	Idem	2
6. Corrosion and corrosion protection of metals and alloys 6.1 Corrosion of metals 6.1.2. Chemical corrosion 6.1.3. Electrochemical corrosion	Idem	2
6.2. Corrosion protection of metals and alloys	Idem	2
Bibliography 1) Şt. Nagy, **Livia Bandici** - „*Metode și procedee tehnologice”*, Editura Universităţii din Oradea, 2017, ISBN 978-606-10-1888-8. 2) V. Petre - “*Tehnologie Electromecanica – Îndrumar de laborator*”, UPB, 2001. 3) F. Anghel, M.O. Popescu - “*Tehnologii Electromecanice*”, UPB, 2001. 4) F. Anghel, I. Bestea - “*Tehnologii Electromecanice – Aplicaţii practice*”, UPB, 2003. 5) T. Tudorache – “M*etode si procedee tehnologice”*, UPB, 2003. 6) L. Balteș – “*Ştiinţa si ingineria materialelor*”, Reprografia Universităţii “Transilvania”Braşov, 2004. 7) G. Oprea – “*Chimie fizică. Teorie şi aplicaţii”*, Editura Risoprint, Cluj Napoca, 2005, ISBN 973-656-909-8. 8) D. Hoble, Livia Bandici, Şt. Nagy - „*Sisteme performante de procesare electrotermică a materialelor*”, Editura Universităţii din Oradea, 2012, (ISBN 978-606-10-0767-7). 9) **Livia Bandici**, D. Hoble, Şt. Nagy – „*Tehnologii inovative în procesarea materialelor*”, Editura Universităţii din Oradea, 2011, (ISBN 978-606-10-0472-0). 10) **Livia Bandici**, Dorel Hoble, Stefan Nagy – “*Tehnologii inovative în procesarea materialelor”*. Editura Universităţii din Oradea, 2011, pag. 224, ISBN 978-606-10-0472-0.		
8.2 Laboratory	Teaching methods	No. of hours/ Observations
1. Presentation of the paper, instructions on the work safety rules, processing of the experimental data	- Presentation of the paper (synthesis material); - Test on the theoretical knowledge aquired during the laboratory; - Interpretation of the results.	2
2. Standardization in the machine industry and in electrical engineering	Idem	2
3. Metals and alloys used in the electrotechnical industry	Idem	2
4. Cold treatment technologies	Idem	2
5 Heat treatment technologies	Idem	2

6. The use of MACH4	Idem	2
7. Closing the laboratory situation.	- presenting and handing out the laboratory papers; - the recovery of one missed laboratory is allowed.	2

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1) **Livia Bandici,** Ştefan Nagy - *Metode şi procedee tehnologice. Lucrări practice de laborator*. Editura Universităţii din Oradea, 2018, ISBN 978-606-10-1958-8.
2) V. Petre - "*Tehnologie Electromecanica – Îndrumar de laborator*", UPB, 2001.
3) F. Anghel, M.O. Popescu - "*Tehnologii Electromecanice*", UPB, 2001.
4) F. Anghel, I. Bestea - "*Tehnologii Electromecanice – Aplicaţii practice*", UPB, 2003.
5) T. Tudorache - "*Metode si procedee tehnologice"*, UPB, 2003.
6) L. Balteş - "*Ştiinţa si ingineria materialelor*", Reprografia Universităţii "Transilvania"Braşov, 2004.
7) G. Oprea - "*Chimie fizică. Teorie şi aplicaţii"*, Editura Risoprint, Cluj Napoca, 2005, ISBN 973-656-909-8.
8) Şt. Nagy, **Livia Bandici** - „*Metode și procedee tehnologice"*, Editura Universităţii din Oradea, [ISBN 978-606-10-1888-8], 2017.
9) Hütte - „*Manualul inginerului. Fundamente*", Editura Tehnică, Bucureşti, 1989.

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

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10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	Minimum required conditions for passing the exam (mark 5): in accordance with the minimum performance standard	The evaluation can be done face to face or online.	50 % from 0,5 VP_F;
10.5 Laboratory	Minimum required conditions for promotion (grade 5): in accordance with the minimum performance standard		
Note components: Final Periodic Verification (VPF), Laboratory (LF) Grade calculation formula: VP Grade = 0.5VPF + 0.5LF; LF = 0.450L + 0.05R; VPF = (VPI + VPII) / 2;			
10.6 Minimum performance standard: Carrying out works under coordination, in order to solve some problems specific to the field, with the correct evaluation of the workload, the available resources, the necessary completion time and the risks, in conditions of application of the norms of safety and health at work;			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field/ Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject		Linear algebra, analytical and differential geometry					
2.2 Holder of the subject		Lecturer Fechete Dorina, PhD					
2.3 Holder of the academic seminar/laboratory/project		Lecturer Tripe Adela, PhD					
2.4 Year of study	1	2.5 Semester	1	2.6 Type of the evaluation	Ex	2.7 Subject regime	Fundamental Discipline

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

3.1 Number of hours per week	3	of which: 3.2 course	2	3.3 academic seminar/laboratory/project	1/-/-
3.4 Total of hours from the curriculum	42	Of which: 3.5 course	28	3.6 academic seminar/laboratory/project	14/-/-
Distribution of time					33 hours
Study using the manual, course support, bibliography and handwritten notes					14
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					5
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					7
Tutorials					3
Examinations					4
Other activities.					
3.7 Total of hours for individual study	**33**				
3.9 Total of hours per semester	**75**				
3.10 Number of credits	3				

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions) -
4.2 related to skills	-

5. Conditions (where applicable)

5.1. for the development of the course	
5.2.for the development of the academic seminary/laboratory/project	

6. Specific skills acquired	
Professional skills	*Proper implementation of specific fundamental knowledge of mathematics, physics, chemistry, in the field of electrical engineering*
Transversal skills	

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ Identifying notions, describing theories and using specific language ▪ Correct explanation and interpretation of mathematical concepts, using specific language ▪ Adequate identification of concepts, methods and techniques of mathematical demonstration ▪ Use of mathematical reasoning in demonstrating mathematical results
7.2 Specific objectives	▪ The student is able to practically apply the acquired theoretical knowledge.

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
1. Preliminaries (Sets, relations, functions, algebraic structures, matrices, determinants, linear systems)	lecture	2
2. Vector spaces. Properties and examples	lecture	2
3. Basis and dimension of a vector space	lecture	2
4. Change of basis of a vector space	lecture	2
5. Subspaces	lecture	2
6. Linear functions. Definitions and properties	lecture	2
7. The matrix associated with a linear function	lecture	2
8. Eigenvectors and eigenvalues.	lecture	2
9. Scalar products, norms and metrics	lecture	2
10. Bilinear and quadratic forms	lecture	2
11. The vector space of the Euclidean vectors	lecture	2
12. The plane and the line	lecture	2
13. Conic sections and quadric surfaces	lecture	2
14. Curves and surfaces	lecture	2

Bibliography

1. I. Fechete, D. Fechete, *Algebră Liniară. Teorie şi probleme*, Ed. Univ. Oradea, 2010
2. Gh. Ivan, Bazele algebrei liniare si aplicatii, Ed. Mirton, Timisoara, 1996
3. C. I. Radu, Algebra liniara, geometrie analitica si diferentiala, Ed. ALL, Bucuresti, 1996
4. M. Rosculet, *Algebra liniara, geometrie analitica si diferentiala*, Ed. Tehnica, 1987
5. Gh. Sabac, *Matematici speciale,* E.D.P., Bucuresti, 1981

8.2 Seminar	Teaching methods	No. of hours/ Observations
1. Preliminaries (Sets, relations, functions, algebraic structures, matrices, determinants, linear systems)	Exercise	1
2. Vector spaces. Properties and examples	Exercise	1
3. Basis and dimension of a vector space	Exercise	1
4. Change of basis of a vector space	Exercise	1
5. Subspaces	Exercise	1
6. Linear functions. Definitions and properties	Exercise	1
7. The matrix associated with a linear function	Exercise	1
8. Eigenvectors and eigenvalues.	Exercise	1
9. Scalar products, norms and metrics	Exercise	1
10. Bilinear and quadratic forms	Exercise	1
11. The vector space of the Euclidean vectors	Exercise	1
12. The plane and the line	Exercise	1
13. Conic sections and quadric surfaces	Exercise	1
14. Curves and surfaces	Exercise	1

Bibliography

1. I. Fechete, D. Fechete, *Algebră Liniară. Teorie şi probleme*, Ed. Univ. Oradea, 2010
2. C. I. Radu, *Algebra liniara, geometrie analitica si diferentiala*, Ed. ALL, Bucuresti, 1996

3. M. Rosculet, *Algebra liniara, geometrie analitica si diferentiala*, Ed. Tehnica, 1987
4. Gh. Sabac, *Matematici speciale*, E.D.P., Bucuresti, 1981
5. S. Chirita, *Probleme de matematici superioare*, Ed. Didactica si Pedagogica, Bucuresti, 1989

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- Training of specialists able to meet all current requirements of the labor market
- Ensuring adequate training for the study of cutting-edge fields of science and technology

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	-	Written examination	50 %
10.6 Seminar	-	Written examination	50 %
10.8 Minimum performance standard: -			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Datarelated to thesubject

2.1 Name of the subject	**Accounting**						
2.2 Holder of the subject	**Lecturer Rica Ivan, PhD Econ.**						
2.3 Holder of the academic laboratory/project	**Lecturer Rica Ivan, PhD Econ.**						
2.4 Year of study	**II**	2.5 Semester	**4**	2.6 Type of the evaluation	**Exam**	2.7 Subject regime	**Specialty subject**

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

3.1 Number of hours per week	**4**	of which: 3.2 course	**2**	3.3 academic laboratory/project	**2**
3.4 Total of hours in the curriculum	**56**	of which: 3.5 course	**28**	3.6 academiclaboratory/project	**28**
Distribution of time					44 hours
Study using the manual, course handbook/guide, bibliography and handwritten notes					14
Supplementary documentation work using the library, on field-related electronic platforms and in field-related places					10
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					14
Tutorials					2
Examinations					4
Other activities.					

3.7 Total of hours for individual study	**44**
3.9 Total of hours per semester	**100**
3.10 Number of credits	**4**

4. Pre-requisites(where applicable)

4.1 related to the curriculum	
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses; - The course can be held face to face or online.
5.2.for the development of the academic laboratory/project	- The seminar/laboratory/projectcan be held face to face or online.
6. Specific skills acquired	

Professional skills	**S2.** Elaboration and interpretation of technical, economic and managerial documentation **S4.** Elaboration and evaluation of business related technical, economic and financial flows, the management of technical, economic and financial phenomena. **S6.** Management and control of the firms and processes specific to study program: project management and management of a company active in the electric, electronic and energy market fields.
Transversal skills	**TS 2.** Assigning roles and responsibilities in a multi-specialized decision-making team and assigning tasks, with the application of relationship techniques and efficient work within the team.

7. The objectives of the discipline(as resulting from the grid of the specific skills acquired)

7.1 The general objective of the subject	• Combining and selecting the computer aided concepts, theories and methods in the Engineering and Management fields and their use in the professional communication. • Using basic academic knowledge for the explanation of concepts regarding the design and implementation of some computer integrated Engineering and Management specific tasks and processes. • Application of principles and methods such as the analysis, synthesis and mathematical modelling of the economic and financial phenomena in the design of economic and financial flows specific to economic domain under qualified supervision. • Adequate use of standard criteria and methods for the finding, modelling, analysis and interpretation of the limits of IT software and concepts in the development of design and implementation systems for some specific activities in Engineering and Management. • Defining basic theories and methods regarding the economic concepts in the professional communication. • Using the basic knowledge for the explanation and interpretation of economic evaluation techniques and methods of a business in the fields of academic interest. • Elaboration of some professional projects regarding some Engineering and Management specific activities, based on the selection and use of principles, methods and software applications. • Training of students as tomorrowspecialists needed in the information society. • Training of engineering economists for multidisciplinary research. • Training students so that they can easily adapt to the fast pace changes taking place in technology and management in the nowadays economy; • Implementing and substantiating the notion of team by approaching some team

	projects.
7.2 Specific objectives	• Knowing and understanding (soundlearning and proper use of discipline-specific notions). • Understanding the account as specific procedure of the accounting method. Becoming familiar with the accounts operating rules. • Understating the accounting analysis. Explaining the structure of the account, the double entry accounting system, the accounting system and general charts of accounts. • Interpretation of economic and financial operations and the reflection thereof through accounts.

8. Contents

8.1 Course	Teaching methods	No. of hours/ Observations
Chapter 1. **The essence and role of accounting in the information system.** Development of accounting and the function thereof. Basic principles and accounting requirements. The place of accounting within the studied disciplines.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 2. **The system of accounts and double entry accounting system.**Accounting accounts specific notions, their functions and structure. Classification of accounts. Asset and liability accounts.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 3. **Double entry accounting system and its significance**. Accounting records and their types. Synthetic and analytical accounts, their interdependence. Trial balances and their control significance. Interdependence of accounting accounts with the balance sheet. Chart of accounts.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter. 4. **Balance sheet - basic element of the accounting method.** The fundamentals of the balance sheet and its importance. Balance sheet structure. Characteristics of balance sheet items.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 5. **Types of changes in the balance sheet under the influence of economic operations.** Balance sheet functions.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 6. **Analysis of capital and fixed assets accounts.** Accounting analysis, accounting formula, accounting system and classification of accounts.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**

Chapter 7.**Analysis of stock and third party accounts.** Accounting analysis, accounting formula, accounting system and classification of accounts.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 8. **Analysis of treasury accounts, expenses and income.** Accounting analysis, accounting formula, accounting system and classification of accounts.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 9. **The content, role and functions of the trial balance.**	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 10. **Preparation of balance of accounts, accounting errors.**	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 11. **Calculation - procedure of the accounting method.**	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 12. **Inventory and its role in accounting.** The fundamentals, significance and types of inventory. How to perform the inventory. Determining the results of the inventory and inventory accounting.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 13. **Registers and forms of accounting**. Classification of accounting records. The accounting records technique. Methods of correcting accounting errors. The fundamentals of accounting forms.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 14. **Documentation of economic operations.** The documents specific notions and functions. Classification of documents. Completion and classification of documents. Document route.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
		28
Bibliography: 1.Rica Ivan, Contantabilitateaintreprinderii, Oradea University Press, 2002 2.Rica Ivan, Contantabilitateaintreprinderii - aplicatii practice, Oradea University Press, 2002 3.Ivan Rica, Contabilitate -handbook, Oradea University Press, 2010, on electronic format - CD		
8.2 Academic laboratory/seminar	Teaching methods	No. of hours/ Observations

1. The account concept, necessity, functions, structure of the account.	Debates on case studies, with students' contribution exercises and problem solving	**2h**
2. Account form, account operation rules, double entry accounting system.		**2h**
3. Accounting analysis, accounting formula, accounting system and classification of accounts.		**2h**
4. Analysis of capital and fixed assets accounts.		**2h**
5. Analysis of stock and third party accounts.		**2h**
6. Analysis of treasury accounts, expenses and income.		**2h**
7. The content, role and functions of the trial balance. Balance of accounts, accounting registration errors.		**2h**
8. Calculation - procedure of the accounting method.		**2h**
9. The concept of inventory and the types of inventory		**2h**
10. Inventory stages.		**2h**
11. Accounting cycle and accounting forms.		**2h**
12. Accounting records.		**2h**
13. Trial balance.		**2h**
14. Balance sheet.		**2h**
Bibliography 1. Ivan Rica, Contabilitate-aplicații practice, Oradea University Press, 2020, on electronic format - CD		
	Teaching method	Observations

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the study program

- The content of the academic discipline can be found in the curriculum of the Economic Engineering in electronic, engineering and energy fields of specialization in other university centers that accredited these specializations.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark/grade
10.4 Course	-In order for a student to obtain the pass mark (5)s/he is required to know the fundamental notions required in the study subjects, without presenting them in detail. -In order for the student to obtain the maximum mark (10) s/he is required to make the proof of a thorough knowledge of all study subjects.	**Midterm evaluation** Each student receivesfor solving a quiz with 3 answer options per each question and practical applications (a total of 10 points). The evaluation can be held to face or online.	70 %
10.5Laboratory			
10.6 Seminar	- In order for a student to obtain the pass mark (5) s/he is required to recognize the steps used in the making of the practical applications, without presenting them in detail;	**Practical application** At each seminar students sit in a test and receive a grade. Each student also receives a grade for his/her activity at seminar throughout the semester. This results in	30%

	-In order for the student to obtain the maximum mark (10) s/he is required to make the proof of a thorough knowledge of all practical applications.	an average grade for the seminar. The evaluation can be held face to face or online.	

10.7 Minimum performance standard:

Course:

-Elaboration of a professional project specific to the field of Engineering and Management using specific software systems and databases.

- Designing economic-financial processes at business level, for a certain situation;
- Development of projects that follow the management of the enterprise active in the electrical, electronic and energy fields

Seminar:

- Responsible making, in conditions of qualified supervision, of projects for solving some domain specific problems, with the correct evaluation of the workload, of the available resources, of the necessary completion time and of the risks, amid the application of deontological and ethical norms in the field, as well as of occupational safety and health norms.

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject			**Basics of management**				
2.2 Holder of the subject			**Assoc.prof. PhD eng.ec. Liliana Doina Măgdoiu**				
2.3 Holder of the academic seminar /laboratory/project			**Assoc.prof. PhD eng.ec. Liliana Doina Măgdoiu**				
2.4 Year of study	**II**	2.5 Semester	**4**	2.6 Type of the evaluation	**VP**	2.7 Subject regime	**DD**

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

3.1 Number of hours per week	**4**	of which: 3.2 course	**2**	3.3 academic seminar	**2**
3.4 Total of hours from the curriculum	**56**	Of which: 3.5 course	**28**	3.6 academic seminar	**28**

Distribution of time	hours
Study using the manual, course support, bibliography and handwritten notes	16
Supplementary documentation using the library, on field-related electronic platforms and in field-related places	12
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	12
Tutorials	0
Examinations	4
Other activities.	

3.7 Total of hours for individual study	**44**
3.9 Total of hours per semester	**100**
3.10 Number of credits	**4**

4. Pre-requisites (where applicable)

4.1 related to the curriculum	Course knowledge: Fundamentals of Economics, General Economics, Managerial Communication, Accounting, Finance and Credit, Law
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses - The course can be held face to face or online
5.2.for the development of the academic seminar	- Mandatory presence at all seminars; - The can be carried out face to face or online - Students come with the observed seminar papers - A maximum of 4 works can be recovered during the semester (30%); - The frequency at seminar hours below 70% leads to the restoration of

	the discipline - The seminar can be held face to face or online

6. Specific skills acquired	
Professional skills	**C1.**Make calculations, demonstrations and applications in order to solve specific engineering and management tasks, based on knowledge achieved from fundamental sciences and engineering sciences.
Transversal skills	**TC3.** Identify the long-life training opportunities and the efficient use (for self-development) of informational sources, as well as communication and assisted professional training resources (Internet websites, dedicated software applications, databases, on-line courses etc.) both in Romanian language and some other international spoken language.

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	• Familiarization of students with theories on the basics of general management
7.2 Specific objectives	♣ The course aims to form the discernment necessary for the objective appreciation and retention by students of the general management issues ♣ The seminar familiarizes students with practical aspects of general management at business level

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
1. Defining management	Free exposure, with the presentation of the course with video projector, on the board or online	2h
2. Classical and contemporary industrial management	Free exposure, with the presentation of the course with video projector, on the board or online	2h
3.Management development in Romania	Free exposure, with the presentation of the course with video projector, on the board or online	2h

4.Management functions	Free exposure, with the presentation of the course with video projector, on the board or online	2h
5.Company and environment	Free exposure, with the presentation of the course with video projector, on the board or online	2h
6.Management information system	Free exposure, with the presentation of the course with video projector, on the board or online	2h
7.The decision-making process in the company	Free exposure, with the presentation of the course with video projector, on the board or online	2h
8. Production costs	Free exposure, with the presentation of the course with video projector, on the board or online	2h
9.Elaboration of the organizational structure of management in the company	Free exposure, with the presentation of the course with video projector, on the board or online	2h
10.Conceptual approaches regarding company strategies and methods	Free exposure, with the presentation of the course with video projector, on the board or online	2h
11.Specific management techniques	Free exposure, with the presentation of the course with video projector, on the board or online	2h

12. Specific management techniques	Free exposure, with the presentation of the course with video projector, on the board or online	2h
13.Management team	Free exposure, with the presentation of the course with video projector, on the board or online	2h
14.Planning and organizing the working time of the management staff	Free exposure, with the presentation of the course with video projector, on the board or online	2h

Bibliography

1. Rada, Ioan Constantin; Măgdoiu, Liliana Doina, **Management general**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2009, CD-ROM
2. Rada, Ioan Constantin; Rica, Ivan; Măgdoiu, Liliana Doina, **Tehnici de negociere**, Editura Universității din Oradea, 2011, CD-ROM
3. Lazăr, Ioan et. Comp., **Management General**, Ed. Risoprint, Cluj-Napoca, 2004
4. Măgdoiu, Liliana Doina, **Management şi Comunicare în Ingineria Economică**, Ed. CA Publishing, Cluj-Napoca, 2012
5. Rada**,** Ioan Constantin, **Economie generală I**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2009,CD-ROM
6. Rada**,**Ioan Constantin, **Economie generală II**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2009,CD-ROM
7. Rada, Ioan Constantin **Microeconomie. Idei moderne. Vol. I**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2007
8. Rada, Ioan Constantin, **Microeconomie. Idei moderne. Vol. II**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2008
9. Rada, Ioan Constantin; Rica, Ivan; Măgdoiu, Liliana Doina**, Finanţe şi credit (note de curs)**, Editura Universităţii din Oradea, 2011, CD-ROM
10. Rada, Ioan Constantin; Rica Ivan; Măgdoiu, Liliana Doina**, Finanţe şi credit (aplicaţii pentru seminar)**, Editura Universității din Oradea, 2011, CD-ROM
11. Ştefan Nagy, Ioan Constantin Rada, **Sisteme avansate de producţie (note de curs)**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2008, CD-ROM
12. Ştefan Nagy, Ioan Constantin Rada, **Sisteme avansate de producţie (aplicaţii)**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2008, CD-ROM

8.2 Academic seminar	Teaching methods	No. of hours/ Observations
1. Paper: Management concepts 2. Report: About resources 3. Paper: Motivation as a function of management 4. Paper: The role of the environment in the company 5. Report: Management information system 6. Paper: Substantiation of managerial decisions 7. Report: Company organization	Students receive laboratory papers at least one week in advance, study them, inspect them, and take a theoretical test at the beginning of the laboratory. Then, the students carry out the practical part	4h 4h 4h 4h 4h 4h 4h

	of the work under the guidance of the teacher	
Bibliography It is the one indicated for the course		

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline can be found in the curriculum of **Economic Engineering in Electric, Electronic and Energetic Field** from other university centers that have accredited these specializations (Technical University of Cluj-Napoca, University of Craiova, "Politehnica" University of Timisoara, Gh. Asachi University of Iasi, etc.) and knowledge of the types of electric drives and their operation and design is a stringent requirement of employers in the field (Comau, Faist Mekatronics, Celestica, GMAB, etc.).

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods The evaluation can be done face-to-face or online	10.3 Percent from the final mark
10.4 Course	Minimum required conditions for passing the exam (mark 5): in accordance with the minimum performance standard it is necessary to know the fundamental notions required in the subjects, without presenting details on them For 10: thorough knowledge of all subjects is required	**Written exam** Students receive for solving each a form with subjects of theory	70 %
10.5 Seminar	Minimum required conditions for promotion (grade 5): it is necessary to know the structure of the paper and one or two notions of the paper For 10: detailed knowledge of the topic of the paper and its support during the seminar	**Oral presentation** At each seminar, the students prepare a report, which can be collective, which they support and which is submitted to the debates during the seminars. Each student also receives a grade for the seminar activity during the semester	30%
10.6 Minimum performance standard: Course: Selection and independent use of learned methods and algorithms for known standard situations as well as completion of calculations (analytical and numerical) with physical quantities. Responsible realization, in conditions of qualified assistance, of projects for solving some problems specific to the field, with the correct evaluation of the workload, of the available resources, of the necessary completion time and of the risks, in conditions of application of deontological and ethical norms. professional in the field, as well as occupational safety and health.			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject	**Economic legislation**						
2.2 Holder of the subject	**Lect. PhD jr. Anca PĂCALĂ**						
2.3 Holder of the academic seminar/laboratory/project	**Lect. PhD jr. PĂCALĂ**						
2.4 Year of study	II	2.5 Semester	4	2.6 Type of the evaluation	Examination	2.7 Subject regime	DD

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

3.1 Number of hours per week	2	of which: 3.2 course	2	3.3 academic seminar/laboratory/project	-
3.4 Total of hours from the curriculum	28	Of which: 3.5 course	28	3.6 academic seminar/laboratory/project	-
Distribution of time					47h
Study using the manual, course support, bibliography and handwritten notes					28
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					16
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					
Tutorials					
Examinations					3
Other activities.					

3.7 Total of hours for individual study	**47**
3.9 Total of hours per semester	**75**
3.10 Number of credits	3

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of	- Attendance at least 50% of the courses

the course	- The course can be held face to face or online
5.2.for the development of the academic laboratory/project	

6. Specific skills acquired
C2. Elaborate, interpret and analyze technical, economical and managerial documents. **C3.** Companies planning, programming and management, as well as associated logistic networks, and also, follow the production.
CT2. Identify the roles and responsibilities of each member of a pluri-disciplinary team and apply efficient work and relational techniques inside the team. **CT3.** Identify the long-life training opportunities and the efficient use (for self-development) of informational sources, as well as communication and assisted professional training resources (Internet websites, dedicated software applications, databases, on-line courses etc.) both in Romanian language and some other international spoken language.

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	Familiarizing students with notions from unstudied fields, knowledge, understanding, explanation and interpretation of the main provisions contained in normative acts of major importance for any graduate of higher education and especially for those in the field of Engineering Sciences
7.2 Specific objectives	The course presents the elements, principles, ideas regarding the theoretical bases of the development of a technical activity in a European legislative framework. We aim, in particular, to form the discernment necessary for the objective assessment and retention by students of the issue of European legislation. The seminar acquaints the students with the terminology specific to the discipline, helping them to understand and interpret the provisions of the normative acts incident to the field of studies

8. 8. Contents

8.1.Course	Teaching methods	No. of hours/ Observations
General notions of legislation in the field Law on electricity and natural gas no. 123/2012. Romania's energy strategy Law 56/2006 - efficient use of energy Regulations regarding renewable energy sources Licenses, authorizations and accreditations in the electricity sector.	Free exposure, with the presentation of the course with video projector, on the board or online	8h
Legislation on competition: unfair competition, anti-competitive practices, economic concentration.	Free exposure, with the presentation of the course with video projector, on the board or online	4h
Legislation related to the research and development function: intellectual property - copyright and its protection	Free exposure, with the presentation of the course with video projector, on the board or online	6h
Commercial contracts - definitions, conditions, classification	Free exposure, with the presentation of the course	2h

	with video projector, on the board or online	
Work execution contracts; Design, technical assistance, engineering and consulting contracts; Enterprise contract; Service contract and provision of services; Design contract. The license agreement. The know-how contracts.		6h
Payment and payment instruments: check payment order, documentary collection, documentary letter of credit, bill of exchange, other payment instruments.		2h

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Bibliografie
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2. St. D Cărpenaru, Contracte civile şi comerciale, Ed Hamangiu, Bucureşti 2009
3. Fl Motiu, Contracte speciale în noul Cod Civil. Ed Universul Juridic, Bucureşti, 2009
4. Commission of the European Communities - Communication From The Commission to the European Council and the European Parliament - An Energy Policy For Europe {Sec(2007) 12} Brussels, 10.1.2007 Com(2007) 1 Final
5. Commission of the European Communities - Communication from the Commission - Action Plan for Energy Efficiency: Realising the Potential {SEC(2006)1173} {SEC(2006)1174} {SEC(2006)1175} - Brussels, 19.10.2006 COM(2006)545 final
6. Energy Community – Memorandum on Social Issues – www.energy-community.org
7. Studiul privind reorganizarea şi dezvoltarea sectorului de producere a energiei electrice în România, în vederea creşterii siguranţei şi competitivităţii în condiţii de piaţă liberă - faza II, Studiul de dezvoltare cu costuri mimine a sectorului de producere a energiei electrice – beneficiar CN Transelectrica SA, elaboratori PB Power (UK) şi ISPE (Romania), 2007
8. Codul fiscal
9. Anca Păcală, Elemente de drept comercial,. Ed Univ din Oradea, Oradea, 2012

8.2 Academic seminar/laboratory/project	Teaching methods	No. of hours/ Observations

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline can be found in the curriculum of Economic Engineering in Electric, Electronic and Energetic Field and other university centers that have accredited these specializations (Technical University of Cluj-Napoca, "Politehnica" University of Timisoara, etc.) and knowledge of the types of law is a stringent requirement of employers in the field.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods The evaluation can be done face-to-face or online	10.3 Percent from the final mark
10.4 Course	Minimum required conditions for passing the exam (mark 5): in accordance with the minimum performance standard it is necessary to know the fundamental notions required in the	**Oral examination** Students receive for solving each a form with 2 subjects of theory and an application.	100 %

	subjects, without presenting details on them For 10: thorough knowledge of all subjects is required		

10.6 Minimum performance standard:

Course: - knowledge of the essential notions in economic legislation – ability to identify mandatory clauses to be inserted in a contract – ability to know and recognize the extent of one's rights and obligations related to contractual business relationships.

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	Control Systems Engineering and Management
1.4 Field of study	Engineering and management
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	Economic Engineering in Electric, Electronic and Energetic Field

2. Data related to the subject

2.1 Name of the subject			**Electromagnetic compatibility**				
2.2 Holder of the subject			**Prof.Dr.-Ing.Ec. Silaghi Alexandru Marius**				
2.3 Holder of the academic seminar/laboratory/project							
2.4 Year of study	**II**	2.5 Semester	**4**	2.6 Type of the evaluation	**Ex**	2.7 Subject regime	**DD**

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

3.1 Number of hours per week	**4**	of which: 3.2 course	**2**	3.3 academic seminar/laboratory/project	**2**
3.4 Total of hours from the curriculum	**56**	Of which: 3.5 course	**28**	3.6 academic seminar/laboratory/project	**28**
Distribution of time					44h
Study using the manual, course support, bibliography and handwritten notes					24
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					8
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					8
Tutorials					2
Examinations					2
Other activities.					

3.7 Total of hours for individual study	**44**
3.9 Total of hours per semester	**100**
3.10 Number of credits	**4**

4. Pre-requisites (where applicable)

4.1 related to the curriculum	Knowledge of mathematics and physics. PC usage, Electrotehnics.
4.2 related to skills	Electrical and electronic measurements, Electronics

5. Conditions (where applicable)

5.1. for the development of the course	- attending at least 50% of the course - the course can be held face to face or online
5.2.for the development of the academic seminary/laboratory/project	- mandatory presence at all laboratory hours; - students will perform the hours with the lab work; - maximum 4 works (30%) can be recovered during the semester; - frequency at laboratory less than 70% leads to the restoration of discipline. - the laboratory can be carried out face to face or online.
6. Specific skills acquired	

Professional skills	C1. Performing calculations, demonstrations and applications to solve specific tasks of engineering and management based on knowledge in fundamental and engineering sciences. C2.Elaboration and interpretation of technical, economic and managerial documentation. C5.Technical and technological design of the processes regarding the structures and systems in the electrical, electronic and energetic field in quality conditions, technical and technological design of the processes in the electrical, electronic and energetic industry, in given quality conditions.
Transversal skills	

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ The course "Electromagnetic compatibility" proposes a familiarization of students in the field of engineering and management, with the introductory notions and some applications related to electromagnetic compatibility.
7.2 Specific objectives	▪ Being a specialized discipline in electrical engineering, and in the field of engineering and management, its objective is to present calculation methods in a unitary framework of problems of general interest, necessary to solve various specific problems of electromagnetic compatibility. ▪ The laboratory works familiarize students with practical aspects regarding the operation of high frequency electrical systems.

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
Chapter 1. INTRODUCTORY CONSTITUENTS.	Free exposure, with the presentation on-line	2 h
Chapter 2. CIRCUIT MODELS. COUPLINGS. COUPLED LINES. EMISSIONS. IMMUNITY.	Free exposure, with the presentation on-line	4 h
Chapter 3. EMISSIONS. IMMUNITY.CEM.	Free exposure, with the presentation on-line	8 h
Chapter 4. ELECTRICITY QUALITY MONITORING. ISO 9000 INDICATORS.	Free exposure, with the presentation on-line	4 h
Chapter 5. CEM TECHNOLOGY AND MANAGEMENT.	Free exposure, with the presentation on-line	6 h
Chapter 6. TECHNICAL LEVEL ANALYSIS AND QUALITATIVE AT CEM.	Free exposure, with the presentation on-line	4h
Total		28 h

8.2 Academic seminar/laboratory/project	Teaching methods	No. of hours/ Observations
1. Presentation of the topic and the laboratory 2. Statistical methods with application to electricity quality monitoring 3. Transmission lines 4. Improving the quality of electricity 5. Network filters 6. Design of electromagnetic compatibility of electrical systems. Radiated emissions 7. Simulation of specific electromagnetic compatibility problems 8. Analysis of circuits that model electromagnetic compatibility problems 9. Immunity to conduction disturbances 10. Recovery of laboratory hours and verification of the acquired notions	Students receive lab reports at least one week before, study them, study them, and give a theoretical test at the beginning of the lab. Then, students complete the practical part of the paper under the guidance of the teacher. Free presentation on how to mount the assemblies and check them after the students have finished the assembly.	2 h 4 h 4 h 4 h 4 h 2 h 2 h 2 h
Total		28 h
Bibliography 1. Andrei, H.L., Popovici, D., Cepişcă, C.- *Inginerie Electrică Modernă*, vol. 1, Editura Electra Bucureşti, 250 pp., 2003, ISBN 973-8067-87-1 2. A. De Sabata -Măsurări cu microunde şi optoelectronice, Lit.Universităţii "Politehnica"Timişoara,1996 3. A. Silaghi, A. De Sabata, F. Alexa, A. Buta, S. Baderca, *Measurement of radiated immunity in the automotive industry: Key concepts*, Electronics and Telecommunications (ISETC), 2016 12th IEEE International Symposium on, 27-28 Oct 2016, Timisoara (Romania), pp. 25-28, 2016. 4. C. A. Balanis, *Antenna Theory: Analysis and Design*, Third Edition, JOHN WILEY & SONS, INC., Hoboken, New Jersey, 2012 5. Hănţilă, I.F.,s.a.,Silaghi, M., Leuca,T.- *Elemente de circuit cu efect de câmp electromagnetic*,ICPE, Bucureşti, 1998 6. ISO 11452-2:1995 Road vehicles - *Component test methods for electrical disturbances by narrowband radiated electromagnetic energy*: International Standardization Organisation, 1995 7. International Standard CISPR 25, *"Vehicles, boats and internal combustion engines - Radio disturbance characteristics - Limits and methods of measurement for the protection of on board receivers"*, 3.0 ed. 2008 8. DH.W. Ott, *"Electromagnetic Compatibility Engineering"*, New Jersey: Wiley, 2009 9. C.R. Paul, *"Introduction to Electromagnetic Compatibility"*, 2nd Edition, New Jersey: Wiley, 2006 10. Rohde, L.U., Jain, G. C. , Poddar, A.K.,Ghosh , A. K.- *Introduction to Integral Calculus: Systematic Studies with*		

Engineering Applications for Beginners, Wiley, 2012 11. Ulrich Rohde, J. Whitaker, "*Comm. Receivers: Principles & Design*",4thEd. McGraw Hill,March2017 12. Ulrich L. Rohde,Ajay K. Poddar,Silaghi A. Marius ,*Next Generation Radios*,ICEEA Verona,Italy 2017 13. A.J. Schwab, W. Kürner, *"Compatibilitate electromagnetică"*, Bucureşti: Ed. AGIR, 2013 14. Silaghi,M.A., Rohde,U.L., Fratila,O.C., Silaghi,H.M., T.Ilias., *Study concerning the effects of the high frequency electromagnetic field on human blood*, AMPERE, Karlsruhe, Germany, pp.407-410,2009 15. Helga Silaghi - *Calitatea energiei in sistemele de actionare electrica cu masina de inductie*, Editura Treira , Oradea, 2000, ISBN 973-99649-3-1 16. Silaghi , A.M., Pantea, M.D., Silaghi, Helga – *Electrotehnică industrială*, Editura Universităţii din Oradea, 2010, ISBN 978-606-10-0186-6 17. Silaghi , A.M., Pantea, M.D. - *Introducere în Electrotehnică*, Editura Risoprint, Cluj-Napoca, 2010, ISBN 978-973-53-0258-0 18. Şora, C. - *Bazele electrotehnicii*, Editura Didactică şi Pedagogică , Bucuresti, 1982		

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline can be found in the specialization curriculum and from other university centers in Romania that have accredited these specializations, so knowledge of basic and design notions in this discipline is a stringent requirement of employers in the field (Celestica, Connectronics, Faist Mekatronics, Comau, GMAB etc) from the Oradea Industrial Park area.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	Minimum required conditions for passing the exam (mark 5): in accordance with the minimum performance standard 1pt. - ex officio - attendance at the course 4PT. - 4 medium-level subjects - For 10: 1pt. - ex officio - attendance at the course 9PT. - 9 medium-level subjects	Questioner on line with 9 subjects	80%
10.5 Laboratory	Minimum required conditions for promotion (grade 5): in accordance with the minimum performance standard - for grade 10 it is necessary	Questioner on line	20%

	to go through all the laboratory works, with the completion of the tests.		
10.6 **Final exam note:**	**Nfe**=0,8**Nse**+0,2**Nla**, **Nla**>5		
10.7 Minimum performance standard: Course:- knowing the construction parts and the principle of operation of different electrical equipment. - the ability to identify a particular type of electrical circuit - participating in at least half of the courses. Laboratory: - ability to conceive and read an electrical scheme - ability to carry out an electrical installation; - participation in all laboratory work.			
E110, tel.:+40 259 408 458 , masilaghi@uoradea.ro, **hhtp://masilaghi.webhost.uoradea.ro**			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and Management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**ECONOMIC ENGINEERING IN ELECTRIC, ELECTRONIC AND ENERGETIC FIELD/ Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject	**ELECTRONICS I**						
2.2 Holder of the subject	Prof.univ.dr.ing. CORNELIA EMILIA GORDAN						
2.3 Holder of the academic seminar/laboratory/project	Şef lucrări dr.ing. LUCIAN MORGOŞ						
2.4 Year of study	II	2.5 Semester	3	2.6 Type of the evaluation	EX.	2.7 Subject regime	I

(I) Imposed (O) Optional

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

3.1 Number of hours per week	3	of which: 3.2 course	2	3.3 laboratory	1
3.4 Total of hours from the curriculum	42	of which: 3.5 course	28	3.6 laboratory	14
Distribution of time					58 hours
Study using the manual, course support, references and handwritten notes					24
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					14
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					11
Tutorials					-
Examinations					9
Other activities.					-

3.7 Total hours for individual study	**58**
3.9 Total hours per semester	**100**
3.10 Number of credits	**4**

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	video projector, laptop, smart board
5.2.for the development of the academic laboratory	The existence of the apparatus and equipment necessary for the development in optimal conditions of the works provided in the discipline file. Providing students with the laboratory guide in printed or electronic format.

6. Specific skills acquired

Professional skills	▪ **C1. Make calculations, demonstrations and applications in order to solve specific engineering and management tasks, based on knowledge achieved from fundamental sciences and engineering sciences.** - Identification, selection of terminology, concepts and methods in the technical and technological design of processes in the electrical, electronic and energy industries. - Using basic knowledge to explain and interpret problems that occur in the technical and technological design of electrical, electronic and energy processes in compliance with quality conditions. - Application of basic principles and methods for technical and technological design specific to electrical, electronic and energy processes under conditions of qualified assistance. - Appropriate use of standard evaluation criteria and methods to assess the quality, advantages and limitations of technical and technological projects associated with electrical, electronic and energy processes. - Elaboration of technical and technological projects related to the processes of activities in the electrical, electronic and energetic field, by using established methods and principles.
Trans - versal	▪ **CT2. Identify the roles and responsibilities of each member of a pluri-disciplinary team and apply efficient work and relational techniques inside the team.**

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ The course is taught to second year Economic Engineering in Electric, Electronic and Energetic Fieldstudents. The course addresses notions that will allow future graduates to have a wealth of information on the construction, operation and use of semiconductor electronic devices (semiconductor diode, Zener diode, bipolar transistors, field effect transistors, thyristor, etc.) and of elementary electronic circuits (limiting circuits, mono and bialternating rectifiers, thyristor circuits, simple circuits with operational amplifiers, simple amplification stages).
7.2 Specific objectives	▪ Structure, characteristics and operation of semiconductor devices. ▪ Use of linear models on portions of electronic devices to solve circuits. ▪ Design and operation of simple electronic circuits with diodes, bipolar transistors, field effect transistors, thyristors, operational amplifiers. ▪ Developing a positive attitude towards the activities of assimilating new professional knowledge and information, cultivating and promoting a scientific environment focused on values, forming a positive and responsible professional behavior.

8. Contents*

8.1 **Course** (on site/ on-line)	Teaching methods	No. of hours/ Observations
General - Electrical conduction in semiconductors. Bipolar	Interactive lecture; exposure; video projector presentation	2 hours
Diodes - pn semiconductor diode, Zener diode, varicap diode, LED (symbol, internal structure, characteristic V-A, characteristic parameters).	Interactive lecture; exposure; video projector presentation	2 hours
Transistor I - General; Operation in the active region: characteristics, equivalent circuits, operating parameters, polarization.	Interactive lecture; exposure; video projector presentation	2 hours
Bipolar transistor II - Blocking and saturation operation: characteristics, equivalent circuits, operating parameters.	Interactive lecture; exposure; video projector presentation	2 hours
Bipolar transistor II - Model with hybrid parameters: definition of parameters, equivalent circuits, diagrams with a transistor in different assemblies, simplified model.	Interactive lecture; exposure; video projector presentation	2 hours
Thyristor - Symbol, internal structure, V-A characteristic, operating parameters	Interactive lecture; exposure; video projector presentation	2 hours
Field effect transistors I - General; TEC-J with initial channel and with induced channel (symbol, characteristic and operating parameters).	Interactive lecture; exposure; video projector presentation	2 hours
Field effect transistors II - TEC-MOS with initial channel and with induced channel (symbol, characteristic and operating parameters).	Interactive lecture; exposure; video projector presentation	2 hours
Operational amplifiers - General (symbol, characteristics and operating parameters). Applications: inverter and non-inverter circuits, adder, differentiation circuit, derivator, integrator, logarithmic circuit, rectifier.	Interactive lecture; exposure; video projector presentation	2 hours
Diode rectifier circuits - Mono-alternating, bi-alternating (with median socket, in bridge), with voltage doubling: schemes, mode and operating characteristics.	Interactive lecture; exposure; video projector presentation	2 hours
Thyristor circuits - Simple diagrams, mode and operating characteristics.	Interactive lecture; exposure; video	2 hours

	projector presentation	
Stabilization circuits - Classifications; Operating parameters; Component element.	Interactive lecture; exposure; video projector presentation	2 hours
Transistor Voltage Stabilizers - Schemes with transistors and operational amplifier, with and without protection circuit.	Interactive lecture; exposure; video projector presentation	2 hours

References

1. **C.Gordan**, R.Reiz, L.Ţepelea, L.Morgoş: *Electronică Analogică şi Digitală*, Editura Universit. din Oradea 2010.
2. **C.Gordan**, A.Burca: *Dispozitive electronice*, Curs format electronic, 2015, ISBN 978-606-10-1751-5, Edit.Univ.Oradea
3. S.Castrase, A.Burca, **C.Gordan** *Dispozitive şi circuite electronice*, Îndrumător de lucrări de laborator,ISBN 978-606-10-1610-5 Editura Universităţii din Oradea 2015.
4. R. Albu, **C.Gordan**: *Electronică Analogică şi Digitală I*, Îndrumător de lucrări de laborator format electronic, Editura Universitatii din Oradea 2018, ISBN 978-606-10-1955-7.

8.2 Academic seminar/laboratory/project (on site/on-ine)	Teaching methods	No. of hours/ Observations
1. Study of the semiconductor diode and Zener diode	Practical application. Discussions	2 hours
2. Bipolar transistor in common base and in common emitter assembly mountings.	Practical application. Discussions	2 hours
3. Field effect transistors	Practical application. Discussions	2 hours
4. Recovery circuits	Practical application. Discussions	2 hours
5. The thyristor	Practical application. Discussions	2 hours
6. Operational amplifier in inverter and non-inverter assemblies.	Practical application. Discussions	2 hours
7. Recovery of laboratories. Ending the school situation.	Practical application. Discussions	2 hours

Referecnces

1 **C.Gordan**, R.Reiz, L.Ţepelea, L.Morgoş: *Electronică Analogică şi Digitală*, Editura Universit. din Oradea 2010.
2. **C.Gordan**, A.Burca: *Dispozitive electronice*, Curs format electronic, 2015, ISBN 978-606-10-1751-5, Edit.Univ.Oradea
3. S.Castrase, A.Burca, **C.Gordan**:*Dispozitive şi circuite electronice*, Îndrumător de lucrări de laborator,ISBN 978-606-10-1610-4, Editura Universităţii din Oradea 2015.
4. R. Albu, **C.Gordan**: *Electronică Analogică şi Digitală I*, Îndrumător de lucrări de laborator format electronic, Editura Universitatii din Oradea 2018, ISBN 978-606-10-1955-7.

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- Introduction in the courses and laboratory works of some subjects of interest for the profile economic environment in the industrial area of the city.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	For 10: Active participation in the developed discussions. Documented arguments. Providing relevant solutions to the issues under debate. Knowledge of the basics on all topics covered.	Oral or written evaluation, online or on-site. Discussions. Argue.	60 %
10.5 Seminar	-	-	-
10.6 Laboratory	Written test marked with a minimum of 5. Practical realization of all the requirements imposed by all laboratory works. Well-documented arguments. Reading the required references. A percentage of 15% of the final grade at the laboratory is awarded for the successful completion of all the topics provided for individual study.	Written test. Practical test. Discussions. Online or on-site argumentation	40%
10.7 Project	-	-	-
10.8 Minimum performance standard: obtaining a grade of 5 in each laboratory test; participation and fulfillment of all requirements imposed by each laboratory work; obtaining a grade of 5 in the course tests, as an arithmetic mean of the			

grades obtained in this type of activity. Knowledge of the basics on all the topics taught.

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and Management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**ECONOMIC ENGINEERING IN ELECTRIC, ELECTRONIC AND ENERGETIC FIELD / Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject			**ELECTRONICS II**				
2.2 Holder of the subject			Prof.univ.dr.ing. CORNELIA EMILIA GORDAN				
2.3 Holder of the academic seminar/laboratory/project			Șef lucrări dr.ing. LUCIAN MORGOȘ				
2.4 Year of study	II	2.5 Semester	4	2.6 Type of the evaluation	CA.	2.7 Subject regime	FD

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

3.1 Number of hours per week	3	of which: 3.2 course	2	3.3 academic laboratory	1
3.4 Total of hours from the curriculum	42	Of which: 3.5 course	28	3.6 academic laboratory	14
Distribution of time					33 hours
Study using the manual, course support, references and handwritten notes					14
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					6
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					7
Tutorials					-
Examinations					6
Other activities.					-
3.7 Total hours for individual study	**33**				
3.9 Total hours per semester	**75**				
3.10 Number of credits	**3**				

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	video projector, laptop, smart board
5.2.for the development of the academic laboratory	The existence of the apparatus and equipment necessary for the development in optimal conditions of the works provided in the discipline file. Providing students with the laboratory guide in printed or electronic format.

6. Specific skills acquired	
Professional skills	▪ **C1. Make calculations, demonstrations and applications in order to solve specific engineering and management tasks, based on knowledge achieved from fundamental sciences and engineering sciences.- Identification, selection of terminology, concepts and methods in the technical and technological design of processes in the electrical, electronic and energy industries**. - Using basic knowledge to explain and interpret problems that occur in the technical and technological design of electrical, electronic and energy processes in compliance with quality conditions. - Application of basic principles and methods for technical and technological design specific to electrical, electronic and energy processes under conditions of qualified assistance. - Appropriate use of standard evaluation criteria and methods to assess the quality, advantages and limitations of technical and technological projects associated with electrical, electronic and energy processes. - Elaboration of technical and technological projects related to the processes of activities in the electrical, electronic and energetic field, by using established methods and principles.
Transversal skills	▪ **CT1. Responsibly apply the principles, norms and values of professional ethics in order to achieve the goals and identify the objectives, the available resources, the steps to be done and time spent for finishing the works, the deadlines and the risks involved.**

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ The course is taught to second year Economic engineering in electric, electronic and energetic field students. The course addresses notions that will allow future graduates to have a rich background on the design, operation and use of simple electronic circuits (amplifier, voltage stabilizer, harmonic oscillator, switching circuit, logic circuit).
7.2 Specific objectives	▪ The structure, characteristics and operation of simple electronic circuits (amplifier, voltage stabilizer, harmonic oscillator, switching circuit, logic circuit). ▪ Design and operation of simple electronic circuits such as direct current or alternating current amplifier, voltage stabilizer, LC or RC oscillator, switching circuit (bistable, monostable, stable), respectively logic circuit made in bipolar or unipolar technology. ▪ Developing a positive attitude towards the activities of assimilating new professional knowledge and information, cultivating and promoting a scientific environment focused on values, forming a positive and responsible professional behavior.

8. Contents*

8.1 **Course** (on site/ on-line)	Teaching methods	No. of hours/ Observations
Basic amplification stages - General (classifications, characteristics, parameters). Stages with a transistor in common-emitter, base-common, common-collector assemblies (parameters and operating characteristics).	Interactive lecture; exposure; video projector presentation	2 hours
Alternating current amplifiers - Schemes, parameters, amplification characteristics, operation.	Interactive lecture; exposure; video projector presentation	2 hours
Direct current amplifiers - Differential amplifier: diagram, operation, characteristic parameters.	Interactive lecture; exposure; video projector presentation	3 hours
Harmonic oscillators I - General; Classifications.	Interactive lecture; exposure; video projector presentation	3 hours
Harmonic oscillators II - LC oscillators (schemes, operation).	Interactive lecture; exposure; video projector presentation	2 hours
Harmonic oscillators III - RC oscillators; Quartz oscillators (schemes, operation).	Interactive lecture; exposure; video projector presentation	2 hours
Switching circuits I - Switching circuits without memory. Positive reaction in amplifiers (schemes, operation).	Interactive lecture; exposure; video projector presentation	3 hours
Switching circuits II - Tilting circuits with coupling in the emitter (diagrams, operation, characteristics).	Interactive lecture; exposure; video projector presentation	2 hours
Switching circuits III - Tilting circuits with coupling in the base collector: bistable, monostable, stable (diagrams, operation, characteristics).	Interactive lecture; exposure; video projector presentation	2 hours
Logic circuits I - Generalities; Basic logic functions; Simple logic diagrams made with diodes and transistors.	Interactive lecture; exposure; video projector presentation	2 hours

Logic circuits II - Families of logic circuits, made in bipolar or unipolar technology (schemes, operation).	Interactive lecture; exposure; video projector presentation	3 hours
Logic circuits III - Registers, counters (schemes, operation).	Interactive lecture; exposure; video projector presentation	2 hours

References

1. **C.Gordan**, R.Reiz, L.Ţepelea, L.Morgoş: *Electronică Analogică şi Digitală*, Editura Universit. din Oradea 2010.
2**. C.Gordan**, A.Burca: *Dispozitive electronice*, Curs format electronic, 2015, ISBN 978-606-10-1751-5, Edit.Univ.Oradea
3. S.Castrase, A.Burca, **C.Gordan** *Dispozitive şi circuite electronice*, Îndrumător de lucrări de laborator,ISBN 978-606-10-1610-5 Editura Universităţii din Oradea 2015.
4. R. Albu, **C.Gordan**: *Electronică Analogică şi Digitală I*, Îndrumător de lucrări de laborator format electronic, Editura Universitatii din Oradea 2018, ISBN 978-606-10-1955-7.

8.2. Academic seminar	Teaching methods	No. of hours/ Observations
8.3. **Laboratory** (on site/on-line)		
1. Voltage stabilizers.	Practical application. Discussions	2 hours
2. Alternating current amplifiers.	Practical application. Discussions	2 hours
3. Differential amplifier.	Practical application. Discussions	2 hours
4. Oscillators.	Practical application. Discussions	2 hours
5. Switching circuits.	Practical application. Discussions	2 hours
6. Logic circuits made in bipolar technology.	Practical application. Discussions	2 hours
7. Recovery of laboratories. Ending the school situation.	Practical application. Discussions	2 hours
8.4. Academic project		

References

1 **C.Gordan**, R.Reiz, L.Ţepelea, L.Morgoş: *Electronică Analogică şi Digitală*, Editura Universit. din Oradea 2010.
2. **C.Gordan**, A.Burca: *Dispozitive electronice*, Curs format electronic, 2015, ISBN 978-606-10-1751-5, Edit.Univ.Oradea
3. S.Castrase, A.Burca, **C.Gordan**:*Dispozitive şi circuite electronice*, Îndrumător de lucrări de laborator,ISBN 978-606-10-1610-4, Editura Universităţii din Oradea 2015.
4. R. Albu, **C.Gordan**: *Electronică Analogică şi Digitală I*, Îndrumător de lucrări de laborator format electronic, Editura Universitatii din Oradea 2018, ISBN 978-606-10-1955-7.

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- Introduction in the courses and laboratory works of some subjects of interest for the profile economic environment in the industrial area of the city.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	For 10: Active participation in the developed discussions. Documented arguments. Providing relevant solutions to the issues under debate. Knowledge of the basics on all topics covered.	Oral or written evaluation, online or on-site. Discussions. Argue.	60 %
10.5 Academic seminar	-	-	-
10.6 Laboratory	Written test marked with a minimum of 5. Practical realization of all the requirements imposed by all laboratory works. Well-documented arguments. Reading the required bibliography. A percentage of 15% of the final grade at the laboratory is awarded for the successful completion of all the topics provided for individual study.	Written test. Practical test. Discussions. Online or on-site argumentation	40%
10.7 Project	-	-	-
10.8 Minimum performance standard: obtaining a grade of 5 in each laboratory test; participation and			

fulfillment of all requirements imposed by each laboratory work; obtaining a grade of 5 in the course tests, as an arithmetic mean of the grades obtained in this type of activity. Knowledge of the basics on all the topics taught.

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Control systems engineering**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Electrical Engineering in the Electric, Electronic and Energetic Domain / Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject			**Modern Languages – English (3)**				
2.2 Holder of the subject			**Lecturer PhD. Abrudan Caciora simona Veronica**				
2.3 Holder of the academic laboratory/project							
2.4 Year of study	**II**	2.5 Semester	**3**	2.6 Type of the evaluation	**PE**	2.7 Subject regime	**CD**

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

3.1 Number of hours per week	**1**	of which: 3.2 course		3.3 academic seminar /laboratory/project	**1**
3.4 Total of hours from the curriculum	**14**	Of which: 3.5 course		3.6 academic seminar/ laboratory/project	**14**
Distribution of time					50
Study using the manual, course support, bibliography and handwritten notes					15
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					15
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					15
Tutorials					3
Examinations					2
Other activities.					
3.7 Total of hours for individual study	**36**				
3.9 Total of hours per semester	**50**				
3.10 Number of credits	**2**				

4. Pre-requisites (where applicable)

4.1 related to the curriculum	Basic knowledge of English
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	
5.2.for the development of the academic laboratory/project	- Mandatory presence at 80% of the seminars; - The seminar can be carried out face to face or online

6. Specific skills acquired

Professional skills	
Transversal skills	**CT3.** Effective use of information sources and resources of communication and assisted professional training (Internet portals, specialized software applications, databases, online courses, etc.) both in Romanian and in a language of international circulation.

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	The seminar aims to be, for the students who do not have English as main subject, a means of improving the English knowledge they had acquired in high school, in order to reach the level of language competence that would alow them to understand and produce accurate academic and scientific texts in English, and understand written or verbal texts on topics related to the field of engineering in general and the specialization they have chosen, in particular. During the seminar, students are given the opportunity to produce written texts or to express themselves verbally, in English. In order to achieve these goals, the textbooks elaborated by the foreign languages team of the Department of Automated Systems Engineering and Management are used, as well as specialized books, published by well-known international publishing houses.
7.2 Specific objectives	• Acquiring field-related vocabulary in English and the completion of documents that are specific to the chosen field of study

8. Contents*

8.2 Seminar	Teaching methods	No. of hours/ Observations
Chapter 1 Electric Light Sources. Incandescent lamps. Halogen Lamps. Vocabulary exercises and discussion.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 2. Gerunds and Participles. Revision. Vocabulary and conversation exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 3 : **Low-pressure and High-pressure Discharge Lamps.** Revision and application exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h

Chapter 4. Infinitives (Revision).	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 5. Electric Power Distribution Systems. The Electric Circuit. Induction Heating (Writing and rephrasing exercises)	Free exposure, with the presentation of the course with video projector, on the board or online	1 h
Chapter 6: Computer Games Today. Reading and vocabulary exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 7: Changing the Structure of Information in a Sentence: the Passive Voice.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 8: Electric Machines: Electric Motors, Electric Generators. Transformers. Reading, Speaking.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 9: Review of Conditional Sentences.	Free exposure, with the presentation of the course with video projector, on the board or online	1 h
Chapter 10: Distribution Boards. (Listening and vocabulary exercises)	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 11: The Subjunctive Mood. (Revision and exercises)	Free exposure, with the presentation of the course with video projector, on the board or online	1h

Chapter 12: Considerations on Electric Power Conversion.. (Reading and conversation exrcises**)**	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 13: DC to DC Conversion. AC to DC Conversion. (Revision and exercises)	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 14: The distribution of electricity. Lectura de text si exercitii de vocabular**.**	Free exposure, with the presentation of the course with video projector, on the board or online	1h

References:

Abrudan Simona Veronica, Bandici Adina, *Technical English for Electrical Engineering,* Editura Universității "Lucian Blaga" din Sibiu, 2016.
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Abrudan Simona, Fazecas Eniko, Anton Anamaria, Benţea Violeta, *A Practical Course In English Science and Technology* , Editura Universitatii din Oradea, Oradea 2002
Beakdwood, L, *A first Course in Technical English*, Heinemann, 1978
Fitzgerald, Patrick,ș Marie McCullagh and Carol Tabor, *English for ICT Studies in Higher Education Studies*, Garnet Education, Reading, UK, 2011.
PPP- English for Science and Technology,Cavaliotti,Bucuresti, 1999

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline can be found in the curriculum of Automatics and Applied Informatics and other university centers that have accredited these specializations (Technical University of Cluj-Napoca, University of Craiova, "Politehnica" University of Timisoara, Gh. Asachi University of Iasi, etc.) and knowledge of Technical Engish requirement of employers in the field (Comau, Faist Mekatronics, Celestica, GMAB, etc.).

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods The evaluation can be done face-to-face or online	10.3 Percent from the final mark
10.4 Seminar	Minimum required	Written exam	100 %

	conditions for passing the exam (mark 5): in accordance with the minimum performance standard it is necessary to know the fundamental notions required in the subjects, without presenting details on them For 10: thorough knowledge of all subjects is required	Students rare required to solve exercises, meant at testing the knwledge they acquired during the semester	
10.6 Minimum performance standard: Seminary: Capacity to use English in an appropriate way, depending on the context Capacity to produce any of the documents, written in English, presented and discussed during the seminaries Capacity to use grammatical structures accurately			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Control systems engineering**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Electrical Engineering in the Electric, Electronic and Energetic Domian / Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject			**Modern Languages – English (4)**				
2.2 Holder of the subject			**Lecturer PhD. Abrudan Caciora simona Veronica**				
2.3 Holder of the academic laboratory/project							
2.4 Year of study	**II**	2.5 Semester	**4**	2.6 Type of the evaluation	**PE**	2.7 Subject regime	**Cl**

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

3.1 Number of hours per week	**1**	of which: 3.2 course		3.3 academic seminar /laboratory/project	**1**
3.4 Total of hours from the curriculum	**14**	Of which: 3.5 course		3.6 academic seminar/ laboratory/project	**14**
Distribution of time					50
Study using the manual, course support, bibliography and handwritten notes					15
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					15
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					15
Tutorials					3
Examinations					2
Other activities.					
3.7 Total of hours for individual study	**36**				
3.9 Total of hours per semester	**50**				
3.10 Number of credits	**2**				

4. Pre-requisites (where applicable)

4.1 related to the curriculum	Basic knowledge of English
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	
5.2.for the development of the academic laboratory/project	- Mandatory presence at 80% of the seminars; - The seminar can be carried out face to face or online
6. Specific skills acquired	

Professional skills	
Transversal skills	**CT3.** Effective use of information sources and resources of communication and assisted professional training (Internet portals, specialized software applications, databases, online courses, etc.) both in Romanian and in a language of international circulation.

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	The seminar aims to be, for the students who do not have English as main subject, a means of improving the English knowledge they had acquired in high school, in order to reach the level of language competence that would alow them to understand and produce accurate academic and scientific texts in English, and understand written or verbal texts on topics related to the field of engineering in general and the specialization they have chosen, in particular. During the seminar, students are given the opportunity to produce written texts or to express themselves verbally, in English. In order to achieve these goals, the textbooks elaborated by the foreign languages team of the Department of Automated Systems Engineering and Management are used, as well as specialized books, published by well-known international publishing houses.
7.2 Specific objectives	• Acquiring field-related vocabulary in English and the completion o documents that are specific to the chosen field of study

8. Contents*

8.2 Seminar	Teaching methods	No. of hours/ Observations
Chapter 1 Computer Modeling and Software Used in Electrical Engineering.Vocabulary exercises and discussion.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 2. Computational electromagnetics (electromagnetic modeling): FDTD, FEM, BEM. Vocabulary and conversation exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 3 : **Programming Languages. L**istening exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h

Chapter 4. Simulation Software. Reading and vocabulary exerecises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 5. AutoCAD. (Reading and writing exercises. Writing a report)	Free exposure, with the presentation of the course with video projector, on the board or online	1 h
Chapter 6: COMSOL Multiphysics. Reading a d vocabuary exercises**.**	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 7: Mathcad. Speaking exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 8: MATLAB. Reading and vocabulary exercises.	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 9: Professional ethics. (Discussing aspects relating to the idea of ethics in the engineering domain. Vocabulary related to ethics, rights, laws, etc)	Free exposure, with the presentation of the course with video projector, on the board or online	1 h
Chapter 10: Finding a Job in the field of Electrical Engineering. (Vocabulary relating to persuasion techniques).	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 11: Listening: Hisotry of Electrical Engineering.	Free exposure, with the presentation of the course with video projector, on the board or online	1h

Chapter 12: Speaking: Job interview. (Speaking, role-play and presentation of arguments**)**	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 13: Writing Leaflets Promoting Education in Electrical Engineering. (Writing and vocabulary exercises)	Free exposure, with the presentation of the course with video projector, on the board or online	1h
Chapter 14: Revision of concepts discussed throughout the semester. (Vocabulary exercises).	Free exposure, with the presentation of the course with video projector, on the board or online	1h

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Abrudan Simona Veronica, *English for Computer Science Students,* Editura Universitatii din Oradea, Oradea, 2009
Abrudan Simona Veronica, '*English Practice. A Practical Course in English for Intermediary Students*', Editura Universitatii din Oradea, Oradea 2004
Abrudan Simona, Fazecas Eniko, Anton Anamaria, Benţea Violeta, *A Practical Course In English Science and Technology* , Editura Universitatii din Oradea, Oradea 2002
Beakdwood, L, *A first Course in Technical English*, Heinemann, 1978
Fitzgerald, Patrick,ș Marie McCullagh and Carol Tabor, *English for ICT Studies in Higher Education Studies*, Garnet Education, Reading, UK, 2011.
PPP- English for Science and Technology,Cavaliotti,Bucuresti, 1999

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline can be found in the curriculum of Automatics and Applied Informatics and other university centers that have accredited these specializations (Technical University of Cluj-Napoca, University of Craiova, "Politehnica" University of Timisoara, Gh. Asachi University of Iasi, etc.) and knowledge of Technical Engish requirement of employers in the field (Comau, Faist Mekatronics, Celestica, GMAB, etc.).

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods The evaluation can be done face-to-face or online	10.3 Percent from the final mark
10.4 Seminar	Minimum required	Written exam	100 %

	conditions for passing the exam (mark 5): in accordance with the minimum performance standard it is necessary to know the fundamental notions required in the subjects, without presenting details on them For 10: thorough knowledge of all subjects is required	Students rare required to solve exercises, meant at testing the knwledge they acquired during the semester	
10.6 Minimum performance standard: Seminary: Capacity to use English in an appropriate way, depending on the context Capacity to produce any of the documents, written in English, presented and discussed during the seminaries Capacity to use grammatical structures accurately			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject				**General economy**			
2.2 Holder of the subject				**Assoc.prof. PhD eng.ec. Liliana Doina Măgdoiu**			
2.3 Holder of the academic seminar/laboratory/project				**Lecturer PhD eng.ec. Zoltan Kovendi**			
2.4 Year of study	**II**	2.5 Semester	**3**	2.6 Type of the evaluation	**Ex**	2.7 Subject regime	**Fl**

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

3.1 Number of hours per week	**4**	of which: 3.2 course	**2**	3.3 academic seminar/laboratory/project	**2**
3.4 Total of hours from the curriculum	**56**	Of which: 3.5 course	**28**	3.6 academic seminar/laboratory/project	**28**
Distribution of time					69h
Study using the manual, course support, bibliography and handwritten notes					28
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					12
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					23
Tutorials					2
Examinations					4
Other activities.					

3.7 Total of hours for individual study	**69**
3.9 Total of hours per semester	**125**
3.10 Number of credits	**4**

4. Pre-requisites (where applicable)

4.1 related to the curriculum	
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- attending at least 50% of the course - the course can be held face to face or online
5.2.for the development of the academic seminary/laboratory/project	- mandatory presence at all seminar hours; - students come with observed seminar papers - a maximum of 3 seminars can be recovered during the semester (30%); - attendance at seminar hours below 70% leads to the restoration of the discipline

	- the seminar can be held face to face or online
6. Specific skills acquired	
Professional skills	**C2**.Elaboration and interpretation of technical, economic and managerial documentation. **C3**.Planning, scheduling and management of enterprises, as well as associated logistics networks, as well as production monitoring
Transversal skills	**TC2**.Identifying the roles and responsibilities in a multidisciplinary team and applying effective relationship and work techniques within the team

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ Familiarization of students with the main types of processes and economic phenomena.
7.2 Specific objectives	▪ The course aims to present the theoretical elements of general economics ▪ The seminar acquaints the students with practical aspects regarding the economic-financial flows at business level, the management of the economic an financial phenomenon

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
Chapter 1. Consumer behavior	Free exposure, with the presentation on-line	2 h
Chapter 2. Consumer behavior	Free exposure, with the presentation on-line	2 h
Chapter 3. Market	Free exposure, with the presentation on-line	2 h
Chapter 4. Economic competition	Free exposure, with the presentation on-line	2 h
Chapter 5. Company	Free exposure, with the presentation on-line	2 h
Chapter 6. Behavior of the manufacturer	Free exposure, with the presentation on-line	2 h
Chapter 7. Behavior of the manufacturer	Free exposure, with the presentation on-line	2 h

Chapter 8. Production costs	Free exposure, with the presentation on-line	2 h
Chapter 9. Selling prices	Free exposure, with the presentation on-line	2 h
Chapter 10. Selling prices	Free exposure, with the presentation on-line	2 h
Chapter 11. Selling prices	Free exposure, with the presentation on-line	4 h
Chapter 12. The profit of the entrepreneur	Free exposure, with the presentation on-line	4 h
Total		28 h

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1. Rada, Ioan Constantin, **Economie**, Ed. Anotimp, 2002
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12. Nagy, Ştefan; Rada,Ioan Constantin, **Sisteme avansate de producţie (aplicaţii)**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2008, CD-ROM

8.2 Academic seminar/laboratory/project	Teaching methods	No. of hours/ Observations
1. Paper: Consumer concepts	Students receive homework for the seminar papers or choose their homework at least a week in advance, study, design the papers and present them at the seminar. Appreciations	2 h
2. Report: About resources		2 h
3. Paper: The concept of competition		
4. Paper: The role of the environment in obtaining production factors		2 h
5. Report: The information system of the enterprise		2 h
6. Paper: Substantiation of production cost decisions		
7. Report: The production price and the profit of the entrepreneur		2 h
		2 h
		2 h

	and comments are made under the guidance of the teacher.	
Total		28 h
Bibliography It is the one indicated for the course		

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline is found in the curriculum of economic engineering specialization in electrical, electronic and energy field from other university centers that have accredited these specializations ("Politehnica" University of Timisoara, Technical University of Cluj-Napoca, Gh. Asachi Iasi, etc.), and knowledge the main types of processes and economic phenomena at microeconomic level, the theoretical elements of microeconomics and practical aspects regarding the economic-financial flows at business level, the management of economic and financial phenomenon is a stringent requirement of any employer in the field (Faist Mekatronics, Celestica, Comau, GMAB etc).

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	- for grade 5 it is necessary to know the fundamental notions required in the subjects, without presenting details on them - for grade 10, a thorough knowledge of all subjects is required	**Written exam** Students receive pre-arranged topics for solving	70%
10.5 Seminar	- for note 5, it is necessary to know the structure of the paper and one or two notions from the paper - for grade 10, the detailed knowledge of the issue and its support during the seminar	At each seminar, the students prepare a report, which can be collective, which they support and which is submitted to the debates during the seminars. Each student also receives a grade for the seminar activity during the semester	30%
10.6 Minimum performance standard: Course: - Solving and explaining problems of medium complexity, associated with the discipline of microeconomics or general economics, specific to the field of engineering and management - Participation in at least half of the courses. Seminar: - Designing economic-financial processes at business level, for a given situation - Participation in all seminar work.			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	Department of Control Systems Engineering and Management
1.4 Field of study	Engineering and management
1.5 Study cycle	Bachelor
1.6 Study program/Qualification	Economic Engineering in Electric, Electronic and Energetic Field

2. Data related to the subject

2.1 Name of the subject		**Law**					
2.2 Holder of the subject		**Lect. PhD jr. Anca PĂCALĂ**					
2.3 Holder of the academic seminar/laboratory/project		**Lect. PhD jr. PĂCALĂ**					
2.4 Year of study	II	2.5 Semester	3	2.6 Type of the evaluation	Continuous Assessment	2.7 Subject regime	D

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

3.1 Number of hours per week	3	of which: 3.2 course	2	3.3 academic seminar/laboratory/project	1
3.4 Total of hours from the curriculum	42	Of which: 3.5 course	28	3.6 academic seminar/laboratory/project	14
Distribution of time					58h
Study using the manual, course support, bibliography and handwritten notes					28
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					10
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					14
Tutorials					3
Examinations					3
Other activities.					
3.7 Total of hours for individual study	**58**				
3.9 Total of hours per semester	**100**				
3.10 Number of credits	4				

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses - The course can be held face to face or online
5.2.for the development of the academic laboratory/project	- Mandatory presence at least 70% of the academic seminar; - The academic seminar can be held face to face or online - The frequency at academic seminar hours below 70% leads to the restoration of the discipline

6. Specific skills acquired

C2. Elaborate, interpret and analyze technical, economical and managerial documents. **C3.** Companies planning, programming and management, as well as associated logistic networks, and also, follow the production.
CT1. Responsibly apply the principles, norms and values of professional ethics in order to achieve the goals and identify the objectives, the available resources, the steps to be done and time spent for finishing the works, the deadlines and the risks involved. **CT2.** Identify the roles and responsibilities of each member of a pluri-disciplinary team and apply efficient work and relational techniques inside the team.

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	Familiarizing students with notions from unstudied fields, knowledge, understanding, explanation and interpretation of the main provisions contained in normative acts of major importance for any graduate of higher education and especially for those in the field of Engineering Sciences
7.2 Specific objectives	The course aims to present the theoretical elements of the Romanian legal system. The seminar acquaints the students with the terminology specific to the discipline, helping them to understand and interpret the provisions of the normative acts incident to the field of studies

8. 8. Contents

8.1.Course	Teaching methods	No. of hours/ Observations
Law as a science - introductory notions. Terminology and definitions. Division of law. Legal norm. Classification of legal norms. The structure of the legal norm. The action of the legal norm.	Free exposure, with the presentation of the course with video projector, on the board or online	4h
Elements of constitutional law and political institutions. Definition, specific features. The main institutions of constitutional law. Fundamental rights, freedoms and duties of citizens. The political system in Romania. The principle of separation of powers in the state. The specifics of each of the three powers in the state.	Free exposure, with the presentation of the course with video projector, on the board or online	10h
Elements of criminal law. General notions, definition. The necessity and purpose of criminal law. Characters and principles in the criminal policy of the state. The object of regulation of criminal law. The legal report of criminal law and its subjects. The crime. Constituent elements. Delimitation of the contravention. The causes that removed the criminal character of the deed. Criminal sanctions. Cases that removed criminal liability	Free exposure, with the presentation of the course with video projector, on the board or online	8h
Taxes and fees. Definitions, characters,	Free exposure, with the	6h

classifications. Subjects of taxes. Methods of execution of fiscal obligations	presentation of the course with video projector, on the board or online	

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3. Stefan Georgescu,Filosofia dreptului.O istorie a ideilor din ultimii 2.500 ani, Ed.ALL BECK,Bucuresti,2001.
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8. Nicolae Popa,Teoria generalã a dreptului,Ed.Actami,Bucuresti,1996.
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11. Anca Păcală, Elemente de drept,. Ed Univ din Oradea, Oradea, 2012

8.2 Academic seminar/laboratory/project	Teaching methods	No. of hours/ Observations
1. Terminology and definitions. Division of law. Legal norm. Classification of legal norms. The structure of the legal norm. 2. Elements of constitutional law and political institutions. Definition, specific features. The main institutions of constitutional law. 3. Fundamental rights, freedoms and duties of citizens. 4. The principle of separation of powers in the state. The specifics of each of the three powers in the state. 5. Elements of criminal law. General notions, definition. The necessity and purpose of criminal law. 6. The crime. Constituent elements. Delimitation of the contravention. Criminal sanctions. 7. Tax receivables. Taxes and fees. Definitions, characters, classifications. Subjects of taxes. Methods of execution of fiscal obligations	Students receive academic seminar papers at least one week in advance, study them and take a theoretical test at the beginning of the academic seminar. Then, the students solves cases under the guidance of the teacher.	2 h 2 h 2 h 2 h 2 h 2 h 2 h

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1. Ioan Muraru, Simina Tănăsescu, Constituţia României. Comentariu pe articole, Ed. C.H. Beck, Bucureşti, 2008;Codul Civil Român comentat
2. Codul civil român
1. Codul Penal Român comentat
2. Codul fiscal şi normele de aplicare ace acestuia actualizate

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline can be found in the curriculum of Economic Engineering in Electric, Electronic and Energetic Field and other university centers that have accredited these specializations (Technical University of Cluj-Napoca, "Politehnica" University of Timisoara,

etc.) and knowledge of the types of law is a stringent requirement of employers in the field.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods The evaluation can be done face-to-face or online	10.3 Percent from the final mark
10.4 Course	Minimum required conditions for passing the exam (mark 5): in accordance with the minimum performance standard it is necessary to know the fundamental notions required in the subjects, without presenting details on them For 10: thorough knowledge of all subjects is required	**Oral examination** Students receive for solving each a form with 2 subjects of theory and an application.	60 %
10.5 Academic seminar	Minimum required conditions for promotion (grade 5): in accordance with the minimum performance standard recognition of the stands used to carry out the academic seminar works, without presenting details on them For 10: detailed knowledge of how to perform all academic seminar work.	**Test + practical application** At each academic seminar students receive a test and a grade. Each student also receives a grade for academic seminar work during the semester.	40%
10.6 Minimum performance standard: Course: - knowledge of the basic notions specific to law; -ability to identify normative acts specific to a certain branch of law -ability to interpret the normative acts Academic seminar: - the ability to explain terms used in the field of law -ability to solve practical cases;			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Datarelated to thesubject

2.1 Name of the subject				**Managerial communication**			
2.2 Holder of the subject				**LecturerRica Ivan, PhD Econ.**			
2.3 Holder of the academic laboratory/project				**Lecturer Rica Ivan, PhD Econ.**			
2.4 Year of study	**II**	2.5 Semester	**3**	2.6 Type of the evaluation	**Midterm**	2.7 Subject regime	**I**

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

3.1 Number of hours per week	**2**	of which: 3.2 course	**2**	3.3 academic laboratory/project	**-/-/1**
3.4 Total of hours in the curriculum	**42**	of which: 3.5 course	**28**	3.6 academiclaboratory/project	**-/-/14**
Distribution of time					58hours
Study using the manual, course handbook/guide, bibliography and handwritten notes					28
Supplementary documentation work using the library, on field-related electronic platforms and in field-related places					8
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					14
Tutorials					2
Examinations					6
Other activities.					
3.7 Total of hours for individual study	**58**				
3.9 Total of hours per semester	**100**				
3.10 Number of credits	**4**				

4. Pre-requisites(where applicable)

4.1 related to the curriculum	
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses; - The course can be held face to face or online.
5.2.for the development of the academic laboratory/project	- Students attend the seminar having their seminar/laboratory works prepared. - A seminar/laboratory attendance below 70% means the student has to resume the entire course. - The seminar/laboratory/project can be held face to face or online.

6. Specific skills acquired	
Professional skills	• Planning, scheduling and management of enterprises, as well as associated logistics networks, as well as production monitoring.
Transversal skills	• TS 2. Assigning roles and responsibilities in a multi-specialized decision-making team and assigning tasks, with the application of relationship techniques and efficient work within the team • TS 3. Finding the opportunities for lifelong learning/ continuous training and efficient use, for student's own development, of information sources and of communication resources, and assisted professional training (Internet websites, specialized software applications, online databases and courses, etc.) both in Romanian, as well as in an international language**.**

7. The objectives of the discipline(as resulting from the grid of the specific skills acquired)

7.1 The general objective of the subject	• Learning the subject specific concepts in a normative, descriptive and applicative context, and understanding the basic mechanisms of the functioning of the organizations, and the role thereof within the society. • The subject aims to make students from Economic Engineering in electrical, electronic and energy field with the managerial communication specific knowledge and skills.
7.2 Specific objectives	• The course starts from the prerequisites that managerial communication skills should be constantly learned and improved. Therefore, the main goal of this course is the acquisition by students of the communication skills necessary in the interactions determined by the economic environment, taking into account the use of technological means of communication. • The seminar provides the necessary knowledge for students to be able to communicate in a business environment.

8. Contents

8.1 Course	Teaching methods	No. of hours/ Observations
Chapter. I. The object of managerial communication 1.1. The aim of the course. Definitions 1.2.Decalogue of communication	Free exposure, with the presentation of the course through the video projector and on the board	**2h** **2h**
Chapter II. Business communication 2.1. Defining business communication 2.2. The role and rules of business communication 2.3. Features and functions of business communication	Free exposure, with the presentation of the course through the video projector and on the board	**2h** **2h** **2h**
Chapter III. Active listening. The role of feedback in communication. Listening and active listening. Factors that determine the success or failure of communication	Free exposure, with the presentation of the course through the video projector and on the board	**4h**

Chapter IV. Oral communication. Meeting. A method of communication within the organization	Free exposure, with the presentation of the course through the video projector and on the board	**4h**
Chapter V. Oral communication. Interview as a form of communication within the organization	Free exposure, with the presentation of the course through the video projector and on the board	**4h**
Chapter VI. Written communication 6.1. Business letters 6.2. Leaflets 6.3. Report/Briefing 6.4. Online means of communication	Free exposure, with the presentation of the course through the video projector and on the board	**2h** **2h** **1h** **1h**

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2.Bentea Violeta, Abrudan Simona Veronica -*Comunicare profesională***,** (*Course handbook*), „Societatea Inginerilor de Petrol şi Gaze" Association Publishing House, Bucharest, 2008
3. Daniel Bougnoux, *Introducere în ştiinţele comunicării*, Polirom Publishing House, Iaşi, 2008

8.2 Academic laboratory/seminar	Teaching methods	No. of hours/ Observations
1. Introductory seminar. Factors influencing the success of economic communication. Discussion.	Progressive evaluation. Students solve practical part of the paper under the guidance and supervision of the professor/lecturer.	2h
2. Analysis of non-verbal communication elements present in photographic materials.		2h
3. Role play: Presentation of the behavior to be observed in meetings with foreign businessmen. Active listening exercises.		2h
4. Oral presentation of a speech. Appearance; voice control, techniques for capturing the audience's attention.		2h
5. Practical activity: Analyzing several types of letters. Writing a business letter.		2h
6. Writing a Curriculum Vitae. Writing a letter of intent.		2h
7. Completion of students' academic records at seminar.		2h

Bibliography
1. Abrudan Simona Veronica - *Fundamentele comunicării economice*, Sibiu University Press, 2009
2. Bentea Violeta, Abrudan Simona Veronica -*Comunicare profesională***,** (*Course handbook*), „Societatea Inginerilor de Petrol şi Gaze" Association Publishing House, Bucharest, 2008

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the study program

- The content of the academic discipline can be found in the curriculum of the Economic Engineering in electronic, engineering and energy fields of specialization in other university centers that accredited these specializations(Technical University of Cluj-Napoca, "Politehnica" University of Timisoara, "Gh. Asachi" University of Iași, etc.), and managerial communication is important in finding a possible job.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark/grade
10.4 Course	-In order for a student to obtain the pass mark (5)s/he is required to know the fundamental	**Midterm evaluation** Each student receives for solving a form with 3 theoretical subjects of	70 %

	notions required in the study subjects, without presenting them in detail. -In order for the student to obtain the maximum mark (10) s/he is required to make the proof of a thorough knowledge of all study subjects.	theory andpractical applications. The evaluation can be held to face or online	
10.6 Laboratory	- In order for a student to obtain the pass mark (5)s/he is required to recognize the steps used in the making of the practical applications, without presenting them in detail; -In order for the student to obtain the maximum mark (10) s/he is required to make the proof of a thorough knowledge of all practical applications.	**Practical application** Students are given exercises to solve, in order to test the knowledge they acquired during the seminars. The evaluation can be held face to face or online.	30%
10.7 Minimum performance standard: Solving in due time, through individual and team work activities, under qualified supervision, of the problems that require the application of principles and rules while observing the professional ethics and deontology norms. Responsible ownership of specific tasks in multi-specialized teams and effective communication at institutional level.			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field/ Bachelor of Engineering**

2. Datarelated to thesubject

2.1 Name of the subject			**Automatic control theory**				
2.2 Holder of the subject			**Lect. PhD eng. Coroiu Laura**				
2.3 Holder of the academic laboratory			**Lect. PhD eng. Coroiu Laura**				
2.4 Year of study	**III**	2.5 Semester	**1**	2.6 Type of the evaluation	**Ex**	2.7 Subject regime	**SD**

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

3.1 Number of hours per week	**3**	of which: 3.2 course	**2**	3.3 academic laboratory	**1**
3.4 Total of hours from the curriculum	**42**	Of which: 3.5 course	**28**	3.6 academiclaboratory	**14**

Distribution of time	hours
Study using the manual, course support, bibliography and handwritten notes	26
Supplementary documentation using the library, on field-related electronic platforms and in field-related places	14
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	10
Tutorials	5
Examinations	3
Other activities.	

3.7 Total of hours for individual study	**58**
3.9 Total of hours per semester	**100**
3.10 Number of credits	**4**

4. Pre-requisites(where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses - The course can be held face to face or online
5.2.for the development of the academic seminary/laboratory/project	- The laboratory can be carried out face to face or online - The frequency at laboratory hours below 70% leads to the restoration of the discipline

6. Specific skills acquired

Professional skills	**C1**. Make calculations, demonstrations and applications in order to solve specific engineering and management tasks, based on knowledge achieved from fundamental sciences and engineering sciences. **C4.** Elaborate and evaluate the technical, economical and financial flows (movements) at any business level, and manage the technical, economical and financial phenomena.
Transversal skills	**CT2.** Identify the roles and responsibilities of each member of a pluri-disciplinary team and apply efficient work and relational techniques inside the team.

7. The objectives of the discipline(resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	• Familiarization of students with the basic notions of systems theory with continuous or discrete time, in the field of time and in operational; • Familiarizing students with regulatory structures, system design, stability and performance.
7.2 Specific objectives	• The course aims to study systems with continuous or discrete time in the field of time, operational or frequency as well as control structures, analyzing performance, stability, design and tuning techniques. • The laboratory acquaints the students with practical aspects regarding the mathematical modeling of a physical process with continuous or discrete time and of the regulation methods, with the calculation of the performances, of the stability, of the design and tuning methods.

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
1: Introduction in Automatic Control Theory	Free exposure, with the presentation of the course with video projector, on the board or online	4h
2: Introduction to systems theory	Free exposure, with the presentation of the course with video projector, on the board or online	4h
3: Linear systems with continuous time	Free exposure, with the presentation of the course with video projector, on the board or online	6h
4. Dynamic systems with discrete time	Free exposure, with the presentation of the course with video projector, on the board or online	4h
5: Automation equipment	Free exposure, with the presentation of	4h

	the course with video projector, on the board or online	
6. Performance and design of automatic systems	Free exposure, with the presentation of the course with video projector, on the board or online	6h

Bibliography

1. **Laura Coroiu**, Eugen Ioan Gergely: "*Modelarea si simularea sistemelor*", curs, Editura Universităţii din Oradea, 2010.
2. Ioan Dumitrache, Automatica, vol. 1, Editura Academiei Române 2009
3.Toma Leonida Dragomir: *" Elemente de teoria sistemelor "*, vol.I, Editura Politehnica Timisoara 2004
4. Toma Leonida Dragomir: *" Elemente de teoria sistemelor "*, vol.II, Editura Politehnica Timisoara 2007
5. Dorf.,C.R , Bishop, H.R.:" *Modern Control Systems* ", Prentice-Hall, 1997
6. Karl J. Astrom, Bjorn Wittenmark: "*Computer Controlled Systems.Theory and design*" Third edition, Prentice Hall, Upper Saddle River, New Jersey 07458, 1997
7. Stefan Preitl, Radu-Emil Precup: " *Introducere in ingineria reglarii automate*",curs, Editura Politehnica Timisoara 2001

8.2 Academic Laboratory	Teaching methods	No. of hours/ Observations
Laboratory activity: 1. Presentation of the laboratory and works. 2. Introduction of physical systems models with continuous time and transformations between models using MATLAB. 3. Simulation of signals and processes using the MATLAB environment. MATLAB functions used in automation. Calculation of the time response of linear systems 4. Mathematical modeling and simulation of discrete time systems. Discretization of continuous systems. 5. Systems stability analysis of automatic systems by the distribution method pole-zeros, using MATLAB 6. Tracing the roots location and frequency characteristics using MATLAB. 7. Closing the situation at the laboratory.	The seminary can take place face to face or online, presentation with video projector, on the board or online .	2h/every 2 weeks laboratory

Bibliography

Bibliografie

1. Coroiu Laura, Modelare şi simulare, Îndrumător de laborator, Editura Universităţii din Oradea 2014, CD-ROM Edition, pg94, ISBN 978-606-10-1473-6.
2. Marin Ghinea, Virgiliu Fireteanu, *MATLAB calcul numeri~grafica~aplicatii*, Editura Teora, 1995, ISBN 973-601-275-1
3. Bara, A., - *Ingineria reglării automate,* Editura Universităţii din Oradea , 2012.

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline can be found in the curriculum of Control Systems in Engineering from other university centers that have accredited similar specializations (Technical University of Cluj-Napoca, University of Craiova, "Politehnica" University of Timisoara, Gh. Asachi University of Iasi, etc.) thus the knowledge of the basic notions ofAutomatic control theory is a requirement of employers in the field (Comau, FaistMekatronics, Celestica, GMAB, etc.).

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods The evaluation can be done face-to-face or	10.3 Percent from the final mark

		online	
10.4 Course	Minimum required conditions for passing the exam (mark 5): in accordance with the minimum performance standard it is necessary to know the fundamental notions required in the subjects, without presenting details on them For 10: knowledge of all subjects is required	**Writing examination** Students receive for solving a form with subjects of theory and an application.	70 %
10.5 Laboratory	Minimum required conditions for promotion (grade 6): knowledge of the purpose of the paper, the content and requirements of the experimental part; For 10: detailed knowledge of how to perform all laboratory work.	**Oral presentation** Following the presentation at the laboratory completed during the semester, each student receives a grade.	30%

10.6 Minimum performance standard:

Course: - Learning the notions of systems theory and working with mathematical models and information block schemes.

- Learning the notions of the theory of automatic regulation.
- Implementation of regulation algorithms; regulation performance analysis.
- Participation in at least half of the courses.

Laboratory:

- Ability to design and read an information block diagram;
- Ability to calculate the mathematical model based on the equations of the system or the information block scheme;
- Abilities to solve problems of automatic regulation, design, implementation and analysis;
- Participation in all laboratory work.

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject				**Electrical drive systems**			
2.2 Holder of the subject				**Prof. PhD eng. Helga Silaghi**			
2.3 Holder of the academic laboratory/project				**Lect. PhD eng. Claudiu Costea/ Lect. PhD eng. Claudiu Costea**			
2.4 Year of study	**III**	2.5 Semester	**6**	2.6 Type of the evaluation	**Ex**	2.7 Subject regime	**DD**

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

3.1 Number of hours per week	**6**	of which: 3.2 course	**2**	3.3 academic laboratory/project	**2/2**
3.4 Total of hours from the curriculum	**70**	Of which: 3.5 course	**28**	3.6 academic laboratory/project	**28/28**

Distribution of time	hours
Study using the manual, course support, bibliography and handwritten notes	22
Supplementary documentation using the library, on field-related electronic platforms and in field-related places	13
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	22
Tutorials	
Examinations	9
Other activities.	

3.7 Total of hours for individual study	**66**
3.9 Total of hours per semester	**150**
3.10 Number of credits	**6**

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses - The course can be held face to face or online
5.2.for the development of the academic laboratory/project	- Mandatory presence at all laboratories; - The laboratory/project can be carried out face to face or online - Students come with the observed laboratory works

	- A maximum of 4 works can be recovered during the semester (30%); - The frequency at laboratory hours below 70% leads to the restoration of the discipline

6. Specific skills acquired	
Professional skills	**C1.**Make calculations, demonstrations and applications in order to solve specific engineering and management tasks, based on knowledge achieved from fundamental sciences and engineering sciences. **C2**.Elaborate, interpret and analyze technical, economical and managerial documents. **C5.**Technical and technological design of processes belonging to electric, electronic and energy engineering systems, structures and industry, according to quality requirements
Transversal skills	**TC1.**Responsibly apply the principles, norms and values of professional ethics in order to achieve the goals and identify the objectives, the available resources, the steps to be done and time spent for finishing the works, the deadlines, and the risks involved. **TC2.**Identify the roles and responsibilities of each member of a pluri-disciplinary team and apply efficient work and relational techniques inside the team.

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	• The discipline has as objective the familiarization of the students with the field of electric drives. Theoretical and practical knowledge on the technique of electric drives is provided, as well as research, design and use of electric drive systems with DC and AC machines.
7.2 Specific objectives	• The course aims to present the theoretical elements of the technique of electric drives, electric drives with DC and AC machines • The laboratory familiarizes students with practical aspects of the operation of the electric drive system, the control methods of electrical actions with DC and AC machines, including modern control methods with programmed logic and computer control. • The project provides the necessary knowledge to the students to be able to design an electric drive in the field of lifting and transport equipment.

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
1.Subject of electrical drives 1.1.Introduction in electrical drives 1.2.Structure and construction of electrical drive systems	Free exposure, with the presentation of the course with video projector, on the board or online	 2h 2h
2.General problems of electrical drives technology 2.1.The object of the kinematics and dynamics of electrical drives. Motion equation 2.2.Reporting of couples, moments of inertia, strength and mass 2.3.Mechanical characteristics of electric machines and working mechanisms 2.4.Transmission of the movement from the electric machine to the working mechanism. Electromagnetic couplings	Free exposure, with the presentation of the course with video projector, on the board or online	 2h 2h 2h 2h

3.Electrical drives with DC machines 3.1.Electrical drives with DC machines 3.2. Drives with permanent magnets direct current machines 3.3.Reversible drives with DC machines	Free exposure, with the presentation of the course with video projector, on the board or online	4h 2h 2h
4.Electrical drives with asynchronous machines 4.1.General relationships and mechanical features for electrical drives with asynchronous machines 4.2.Methods of starting for electrical drives with asynchronous machines 4.3.Braking methods for electrical drives with asynchronous machines 4.4.Speed control for electrical drives with asynchronous machines	Free exposure, with the presentation of the course with video projector, on the board or online	2h 2h 2h 2h
Bibliography 1. SILAGHI H., SPOIALĂ V., SILAGHI M. – *Acţionări electrice*, Editura Mediamira , Oradea, 2009 2. SILAGHI, H., SPOIALĂ, VIORICA, *Acţionări electrice-probleme fundamentale şi noţiuni de proiectare*, Ed. Universităţii din Oradea, 2002 3. SILAGHI H., SILAGHI M. – *Sisteme de acţionări electrice cu maşini asincrone*, Editura Treira , Oradea, 2000 4. IANCU V., SPOIALĂ D., SPOIALĂ VIORICA, *Maşini electrice şi sisteme de acţionări electrice*, vol.II, Ed. Universităţii din Oradea, 2006 5. RICHARD CROWDER, *Electric drives and electromechanical systems*, Elsevier, Great Britain, 2006 6. VIORICA SPOIALĂ, HELGA SILAGHI, *Acţionări electrice speciale,* Editura Universităţii din Oradea, 2010		
8.2 Academic laboratory	Teaching methods	No. of hours/ Observations
1. Presentation of the laboratory, of the labor protection norms and of the conventional signs specific to the field of electric drives. 2. Methods and schemes for starting DC motors 3. Using the Simulink program to simulate DC motors with separate excitation drive 4. Methods and schemes for starting asynchronous motors 5. Presentation of the ASMA program used for computer simulation of asynchronous machine drives 6. Study of the component units of the computer-driven electric drive system and tracing the braking characteristics 7.Magnetic powder brake control unit operation mode 8. Changing the speed of drives with asynchronous machines by changing the frequency of the supply voltage 9. Closing the situation at the laboratory.	Students receive laboratory papers at least one week in advance, study them, inspect them, and take a theoretical test at the beginning of the laboratory. Then, the students carry out the practical part of the work under the guidance of the teacher	2h 4h 4h 4h 2h 4h 4h 2h 2h
Bibliography 1. Silaghi H.,SpoialĂ V.,Costea C. - *Acţionări electrice* , Îndrumar de laborator, Lito Universitatea din Oradea, 2008 2. Viorica Spoială, Helga Silaghi, Dragoş Spoială – Acţionări electrice. Indrumator de laborator. Universitatea din Oradea, ISBN 978-606-10-1432-3, Ediţie CD-ROM, 140 pag, 2014		
8.3 Academic project	Teaching methods	No. of hours/ Observations
Design of the lifting mechanism of a general purpose overhead crane	Students receive the project theme and design methodology and under the guidance of the teacher perform the project stages	14h
Bibliography 1. Silaghi Helga, Spoială Viorica, *Proiectarea acţionărilor electrice*, îndrumător de proiectare, Editura Universităţii din Oradea, 2009		

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline can be found in the curriculum of Automatics and Applied Informatics and other university centers that have accredited these specializations (Technical University of Cluj-Napoca, University of Craiova, "Politehnica" University of Timisoara, Gh. Asachi University of Iasi, etc.) and knowledge of the types of electric drives and their operation and design is a stringent requirement of employers in the field (Comau, Faist Mekatronics, Celestica, GMAB, etc.).

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods The evaluation can be done face-to-face or online	10.3 Percent from the final mark
10.4 Course	Minimum required conditions for passing the exam (mark 5): in accordance with the minimum performance standard it is necessary to know the fundamental notions required in the subjects, without presenting details on them For 10: thorough knowledge of all subjects is required	**Written exam** Students receive for solving each a form with 3 subjects of theory and an application.	60 %
10.5 Laboratory	Minimum required conditions for promotion (grade 5): in accordance with the minimum performance standard recognition of the stands used to carry out the laboratory works, without presenting details on them For 10: detailed knowledge of how to perform all laboratory work	**Test + practical application** At each laboratory students receive a test and a grade. Each student also receives a grade for laboratory work during the semester and for the laboratory work file. This results in an average for the laboratory.	20%
10.6 Project	Minimum required conditions for promotion (grade 6): going through the design stages, without deepening the calculations For 10: going through all the design stages, with the completion of the calculations and the electrical supply and control diagrams	**Oral presentation** Following the presentation of the project completed during the semester, each student receives a grade.	20%
10.6 Minimum performance standard: Course: Selection and independent use of learned methods and algorithms for known standard situations as			

well as completion of calculations (analytical and numerical) with physical quantities.
Laboratory: Development and implementation of algorithms and automation structures based on electrical drives, microcontrollers, signal processors, PLCs, embedded systems, etc. by using the principles of project management
The timely solution, in individual activities and group activities, in conditions of qualified assistance, of the problems that require the application of principles and rules respecting the norms of professional deontology.
Responsible assumption of specific tasks in multi-specialized teams and efficient communication at institutional level.
Elaboration and argumentative support of the application of a personal professional development plan.

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject	**Automation**						
2.2 Holder of the subject	**Lect. PhD eng. Diana Mesaros**						
2.3 Holder of the academic laboratory/project	**Lect. PhD eng. Diana Mesaros**						
2.4 Year of study	**III**	2.5 Semester	**6**	2.6 Type of the evaluation	**Ex**	2.7 Subject regime	**DS**

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

3.1 Number of hours per week	**3**	of which: 3.2 course	**2**	3.3 academic laboratory/project	**-/1**
3.4 Total of hours from the curriculum	**42**	Of which: 3.5 course	**28**	3.6 academic laboratory/project	**-/14**

Distribution of time	hours
Study using the manual, course support, bibliography and handwritten notes	33
Supplementary documentation using the library, on field-related electronic platforms and in field-related places	14
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	10
Tutorials	2
Examinations	3
Other activities.	

3.7 Total of hours for individual study	**33**
3.9 Total of hours per semester	**75**
3.10 Number of credits	**3**

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses - The course can be held face to face or online
5.2.for the development of the academic laboratory/project	- Mandatory presence at all laboratories; - The laboratory/project can be carried out face to face or online - Students come with the observed laboratory works - A maximum of 4 works can be recovered during the semester (30%); - The frequency at laboratory hours below 70% leads to the restoration of

	the discipline

6. Specific skills acquired	
Professional skills	**C1.**Make calculations, demonstrations and applications in order to solve specific automation and engineering tasks, based on knowledge achieved from fundamental sciences and engineering sciences. **C2**.Elaborate, interpret and analyze technical documents. **C5.**Technical and technological design of processes belonging to electric, electronic and energy engineering systems, structures and industry, according to quality requirements
Transversal skills	**TC1.**Responsibly apply the principles, norms and values of professional ethics in order to achieve the goals and identify the objectives, the available resources, the steps to be done and time spent for finishing the works, the deadlines, and the risks involved. **TC2.**Identify the roles and responsibilities of each member of a pluri-disciplinary team and apply efficient work and relational techniques inside the team.

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	• The discipline has as objective the familiarization of the students with the field of automation. Theoretical and practical knowledge of automated systems is provided, as well as research, design and use of programmable logic controllers.
7.2 Specific objectives	• The course aims to present the theoretical elements of automated control systems, analogical modelling and numerical simulation of automated processes. • The laboratory familiarizes students with practical aspects of design, implementation and testing automated control loops including modern control methods with programmed logic and computer control.

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
1. Introduction in automation 1.1. Graphical representation of automatic systems. 1.2. Schematic diagrams of automatic systems. 1.3. Components of automatic systems. 1.4. Functions of automatic systems. 1.5. Classification of automatic systems. 1.6. Problems with automatic systems.	Free exposure, with the presentation of the course with video projector, on the board or online	2h/week
2.Automation equipment 2.1. Elements of analog simulation of systems. 2.1.1. Active filter with operational amplifiers. 2.1.2. Performing mathematical operations using active filters with operational amplifiers 2.2. Low order dynamic systems. 2.2.1. Proportional transfer element. 2.2.2. Integrating transfer element. 2.2.3. Derivative transfer element of order 0. 2.2.4. Proportional filter with 1st order timing. 2.2.5. Derivative transfer element with 1st order timing. 2.3. Standard controllers 2.3.1. Proportional derivative controller with 1st order timing. 2.3.2. Proportional integrator controller.		

2.3.3. Derivative integrative proportional controller. Applications 2.4 Numerical controllers 2.5 Programmable controllers 2.6 Microcontrollers 2.7 Transducers and sensors		
3. Properties of automated systems 3.1 Stability of automated systems 3.2 Controllability of automatic systems 3.3 Performance indicators	Free exposure, with the presentation of the course with video projector, on the board or online	2h/week

Bibliography

1. T Coloşi, MI Abrudean, ML Unguresan, V Muresan, Numerical simulation of distributed parameter processes, Springer, 2013
2. D. Sas, *„Modelarea si simularea proceselor cu parametri distribuiti”*, Editura Galaxia Gutenberg, Cluj-Napoca, 2019, 98 pagini, ISBN: 978-973-141-804-9
3. T. Coloşi, M. L. Ungureşan, E. H. Dulf, R. C. Cordoş, “Introduction to Analogical Modeling and Numerical Simulation with (Mpdx) and Taylor Series Distributed Parameters Processes”, Editura Galaxia Gutenberg, Cluj-Napoca, Romania, 2009
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11. I. Dumitrache, *Ingineria reglării automate*, Ed. Politehnica Press, 2005.
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13. Eugen Ioan Gergely, Helga Silaghi, Viorica Spoiala, Laura Coroiu, Zoltan Tamas Nagy, *Automate programabile, Operare, programare, aplicatii*, Editura Universitatii din Oradea, Oradea 2009, ISBN 978-973-759-940-7, 265 pg.
14. Stefan Preitl, Radu-Emil Precup: *” Introducere in ingineria reglarii automate*”,curs, Editura Politehnica Timisoara 2001
15. Toma Leonida Dragomir: *” Elemente de teoria sistemelor ”*, vol.II, Editura Politehnica Timisoara 2007

8.2 Academic laboratory	Teaching methods	No. of hours/ Observations
1. Presentation of the laboratory, of the labor protection norms 2. Design of automation schemes for technical processes. 3. Automation of a heating system with heat exchanger with several control loops. 4. Study of standardized control algorithms with continuous action. Proportional transfer element. 5. Study of standardized control algorithms with continuous action.	Students receive laboratory papers at least one week in advance, study them, inspect them, and take a theoretical test at the beginning of	1h/week

Study of the PI controller. 6. Study of standardized control algorithms with continuous action. Study of the PID controller. 7. Closing the situation at the laboratory.	the laboratory. Then, the students carry out the practical part of the work under the guidance of the teacher	
Bibliography 3. D. Sas, *„Modelarea si simularea proceselor cu parametri distribuiti”*, Editura Galaxia Gutenberg, Cluj-Napoca, 2019, 98 pagini, ISBN: 978-973-141-804-9 4. J. Love , *„Proces Automation Handbook”*, Editura Springer, 2007 5. Coroiu Laura, *Modelare şi simulare*, Îndrumător de laborator 6. www.mathworks.com		
8.3 Academic project	Teaching methods	No. of hours/ Observations
-	-	-

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline can be found in the curriculum of Automatics and Applied Informatics and other university centers that have accredited these specializations (Technical University of Cluj-Napoca, University of Craiova, "Politehnica" University of Timisoara, Gh. Asachi University of Iasi, etc.) and knowledge of the types of electric drives and their operation and design is a stringent requirement of employers in the field (Comau, Faist Mekatronics, Celestica, GMAB, etc.).

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods The evaluation can be done face-to-face or online	10.3 Percent from the final mark
10.4 Course	Minimum required conditions for passing the exam (mark 5): in accordance with the minimum performance standard it is necessary to know the fundamental notions required in the subjects, without presenting details on them For 10: thorough knowledge of all subjects is required	**Written exam** Students receive for solving each a form with 3 subjects of theory and an application.	80 %
10.5 Laboratory	Minimum required conditions for promotion (grade 5): in accordance with the minimum performance standard recognition of the stands used to carry out the laboratory works, without presenting	**Test + practical application** At each laboratory students receive a test and a grade. Each student also receives a grade for laboratory work during the semester and for the laboratory	20%

	details on them For 10: detailed knowledge of how to perform all laboratory work	work file. This results in an average for the laboratory.	

10.6 Minimum performance standard:

Course:

Understanding automation components

Understanding the operation and use of different automation equipments

Participation to at least half of the courses

Laboratory:

Ability to design and read an automatic diagram

Ability to design and verify any automated process

Ability to implement standardized control algorithms in order to obtain the desired parameters

Participation to all laboratory work

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Datarelated to thesubject

2.1 Name of the subject		**Finance and credit**					
2.2 Holder of the subject		**LecturerRica Ivan, PhD Econ.**					
2.3 Holder of the academic laboratory/project		**Lecturer Rica Ivan, PhD Econ.**					
2.4 Year of study	**III**	2.5 Semester	**5**	2.6 Type of the evaluation	**Midterm**	2.7 Subject regime	**Compulsory**

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

3.1 Number of hours per week	**3**	of which: 3.2 course	**2**	3.3 academic laboratory/project	**1**
3.4 Total of hours in the curriculum	**42**	of which: 3.5 course	**28**	3.6 academiclaboratory/project	**14**
Distribution of time					
Study using the manual, course handbook/guide, bibliography and handwritten notes					15
Supplementary documentation work using the library, on field-related electronic platforms and in field-related places					4
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					10
Tutorials					
Examinations					4
Other activities.					
3.7 Total of hours for individual study	**33**				
3.9 Total of hours per semester	**75**				
3.10 Number of credits	**3**				

4. Pre-requisites(where applicable)

4.1 related to the curriculum	
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses; - The course can be held face to face or online.
5.2.for the development of the academic laboratory/project	- The seminar/laboratory/project can be held face to face or online.

6. Specific skills acquired	
Professional skills	**S2.** Elaboration and interpretation of technical, economic and managerial documentation **S4.** Elaboration and evaluation of business related technical, economic and financial flows, the management of technical, economic and financial phenomena.
Transversal skills	**TS 2.** Assigning roles and responsibilities in a multi-specialized decision-making team and assigning tasks, with the application of relationship techniques and efficient work within the team.

7. The objectives of the discipline(as resulting from the grid of the specific skills acquired)

7.1 The general objective of the subject	• Combining and selecting the computer aided concepts, theories and methods in the Engineering and Management fields and their use in the professional communication. • Using basic academic knowledge for the explanation of concepts regarding the design and implementation of some computer integrated Engineering and Management specific tasks and processes. • Application of principles and methods such as the analysis, synthesis and mathematical modelling of the economic and financial phenomena in the design of economic and financial flows specific to economic domain under qualified supervision. • Adequate use of standard criteria and methods for the finding, modelling, analysis and interpretation of the limits of IT software and concepts in the development of design and implementation systems for some specific activities in Engineering and Management. • Defining basic theories and methods regarding the economic concepts in the professional communication. • Using the basic knowledge for the explanation and interpretation of economic evaluation techniques and methods of a business in the fields of academic interest. • Elaboration of some professional projects regarding some Engineering and Management specific activities, based on the selection and use of principles, methods and software applications. • Training of students as tomorrowspecialists needed in the information society. • The training of engineers economists for multidisciplinary research; • Training students so that they can easily adapt to the fast pace changes taking place in technology and management in the nowadays economy; • Implementing and substantiating the notion of team by approaching some team projects.

7.2 Specific objectives	• The main objective is learning of public finances and business activity specific terminology, the basic connections, and the knowledge of financial mechanisms specific to the functioning of the entire economy. The aim of the course if that each student should develop his/her own knowledge in the financial field, to develop the ability to keep up with news and developments in the financial sector, as well as the processing of diverse information in the economic environment.

8. Contents

8.1 Course	Teaching methods	No. of hours/ Observations
Chapter 1. **Organization of budget records in Romania.** Peculiarities of the budget information system. Budgetary records tasks in leading the public budget execution. The scope of the budgetary records. Organizing the budget execution at the level of state bodies and institutions in charge with public budget execution. Credit release authorities: rights and obligations. Organizing budget records based on budget classification. Current and centralized budget records.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 2. **The budget execution accounting organisation and tasks at the level of local financial bodies.**Tasks of local financial bodies. Supporting documents and accounting records in the local budget execution records. The balance sheet of the local budget execution. The chart of accounts of the current records of the local budget execution.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 3. **Recordslocal budget funds and revenues**. Record of the local budget funds. Records of income. Records of unclarified receipts. The restitution order for the income surplus.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 4. **Records of local budget financing and expenditures.** Budgetary financing and its tasks. Budget financing characteristics and methods. Financing of state subordinatedlocal institutions. Records of settlements with local subordination authorizing officers. Records of settlements with local credit release authorities regarding the financing of institutions from the publicbudget. Records of local budget expenditures.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 5. **Records of mutual settlements between the budget and the results of local budgets execution.**Records of mutual settlements between budgets. Records of loans received and granted. Records of commercial credits.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 6. **The accounting records and tasks in the budgetary institutions.**Accounting records and tasks in state institutions.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 7. **Accounting organizationand tasks in state institutions.** Accounting organization and tasks in state institutions. Accounting records in state institutions. The balance sheet and the chart of accounts of the accounting records in state institutions. Duties of the head of the financial-accounting department.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**

Chapter 8. **Records of operations regarding the financing from the publicbudget.** Evidence of budget credits to state subordinated institutions. Funding specific recordsin the case ofstate subordinated local institutions. Records of interdepartmental financing settlements.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 9. **Records of cash operations, cash payer and actual budget expenditures**. Records of cash payments. Records of actual budget expenditures. Records of cash transactions. Records of letter of credit operations, limited purchase check and cash against documents.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 10. **Records of settlements**. Records of operations regarding the payment of remuneration and scholarships. Records of settlements on payments made to the publicbudget. Records of social security settlements. Records of settlements with debtors and creditors. Records of settlements with advance paymentbeneficiaries. Records of settlements in case ofdeficit. Records of settlements with parents for the maintenance of their children in preschool institutions.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 11.**The system of budgetary reports.** The importance of budgetary reporting. Classification of budget reports. Structure, preparation and presentation of reports on the execution of expenditure decisions of state institutions. Inventory of the assets of budgetary institutions. Annual closure of accounts in state institutions. The structure of the reports prepared by the village administrations. The structure of the reports prepared by the financial public agencies.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 12. **The fiscal system.** The fundamentals of the tax system and its place in the activity of the enterprise. Classification of economic agents. Fiscal system (elements and classification).	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter. 13 **The system of public financial resources.** Direct taxes, indirect taxes.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 14. **Public debt.**	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Bibliography: 1 Ioan Constantin Rada, Finante si credit, course handbook on electronic format - CD 2.Ioan Constantin Rada, Rica Ivan, Liliana Doina Măgdoiu, Finanţe şi credit, course handbook, Oradea University Press, 2010, on electronic format - CD		
8.2 Academic laboratory/seminar	Teaching methods	No. of hours/ Observations
1. ORGANIZATION OF THE BUDGETARY RECORD IN ROMANIA Credit release authorities: rights and obligations. Organizing budget records based on budget classification		**1h**
2. THE ROLE AND FUNCTIONS OF PUBLIC FINANCES		**1h**
3. ORGANIZATION OF THE PUBLIC FINANCE SYSTEM The role of the State in financing the economy; Representation of the national economy at macroeconomic level. National Accounts; Organizing public finances at the level of central and		**1h**

local public administrations in Romania.	Debates on case studies, with students' contribution exercises and problem solving	
4. EXPENDITURES IN THE PUBLIC FINANCE SYSTEM Public expenditures and budgetary expenditures; Classification of budget expenditures and factors influencing their evolution; Classification of public expenditures; Factors influencing the evolution of public spending and analysis methods.		**1h**
5. FINANCING PUBLIC SERVICES Public expenditures for social &cultural actions; Public expenditures for economic objectives & actions.		**1h**
6. RESOURCES OF THE PUBLIC FINANCE SYSTEM The financial resources of the national economy; The structure of public finance resources; Fiscal resources.		**1h**
7. INTERNAL AND EXTERNAL PUBLIC DEBT Common characteristics of internal debt. Internal public debt.		**1h**
8. EXTERNAL PUBLIC DEBT Measurement of the degree of indebtedness.		**1h**
9. BUDGETARY PROCESS AT CENTRAL AND LOCAL LEVEL The structure of the public budget system; Budgetary principles; The stages of the budget process at central and local level.		**1h**
10. METHODS AND TECHNIQUES FOR THE ELABORATION OF PUBLIC BUDGETS Operations in the stages of elaboration - execution - control - conclusion.		**1h**
11. ELABORATION OF THE DRAFT BUDGET Execution of cash accounts of the public budgethouse through the banking system and the treasury system.		**1h**
12. CONSOLIDATED GENERAL BUDGET Public budget; State-run social insurance budget.		**1h**
13. PUBLIC INSTITUTIONS BUDGET Local budgets; Budget strengthening operations.		**1h**
14. FISCAL POLICIES – BUDGETARY Economic growth policies used by public authorities currently; Taxation and fiscal policy; Correlation between public spending policy and taxation; Economic Interventionism theory in economic recovery.		**1h**

Bibliography

3. Ioan Constantin Rada, Rica Ivan, Liliana Doina Măgdoiu, Finanţe şi credit, course handbook, Oradea University Press, 2010, on electronic format - CD

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the study program

- The content of the academic discipline can be found in the curriculum of the Economic Engineering in electronic, engineering and energy fields of specialization in other university centers that accredited these specializations.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark/grade
10.4 Course	-In order for a student to obtain the pass mark (5)s/he is required to know the fundamental notions required in the study subjects, without presenting them in detail.	**Midterm evaluation** Each student receivesfor solving a quiz with 3 answer options per each question and practical applications (a total of 10 points).	70 %

	-In order for the student to obtain the maximum mark (10) s/he is required to make the proof of a thorough knowledge of all study subjects.	The evaluation can be held to face or online.	
10.5Laboratory			
10.6 Seminar	- In order for a student to obtain the pass mark (5) s/he is required to recognize the steps used in the making of the practical applications, without presenting them in detail; -In order for the student to obtain the maximum mark (10) s/he is required to make the proof of a thorough knowledge of all practical applications.	**Practical application** At each seminar students sit in a test and receive a grade. Each student also receives a grade for his/her activity at seminar throughout the semester. This results in an average grade for the seminar. The evaluation can be held face to face or online.	30%
10.7 Minimum performance standard:			
Course: -Elaboration of a professional project specific to the field of Engineering and Management using specific software systems and databases. - Designing economic-financial processes at business level, for a certain situation; - Development of projects that follow the management of the enterprise active in the electrical, electronic and energy fields			
Seminar: - Responsible making, in conditions of qualified supervision, of projects for solving some domain specific problems, with the correct evaluation of the workload, of the available resources, of the necessary completion time and of the risks, amid the application of deontological and ethical norms in the field, as well as of occupational safety and health norms.			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Datarelated to thesubject

2.1 Name of the subject	**Financial and economic analysis**						
2.2 Holder of the subject	**LecturerRica Ivan, PhD Econ.**						
2.3 Holder of the academic laboratory/project	**Lecturer Rica Ivan, PhD Econ.**						
2.4 Year of study	**III**	2.5 Semester	**6**	2.6 Type of the evaluation	**Midterm**	2.7 Subject regime	**Comp.**

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

3.1 Number of hours per week	**4**	of which: 3.2 course	**2**	3.3 academic laboratory/project	**2**
3.4 Total of hours in the curriculum	**56**	of which: 3.5 course	**28**	3.6 academiclaboratory/project	**28**

Distribution of time	hours
Study using the manual, course handbook/guide, bibliography and handwritten notes	20
Supplementary documentation work using the library, on field-related electronic platforms and in field-related places	10
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	10
Tutorials	
Examinations	4
Other activities.	

3.7 Total of hours for individual study	**44**
3.9 Total of hours per semester	**100**
3.10 Number of credits	**4**

4. Pre-requisites(where applicable)

4.1 related to the curriculum	
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses; - The course can be held face to face or online.
5.2.for the development of the academic laboratory/project	- The seminar/laboratory/projectcan be held face to face or online.

6. Specific skills acquired

Professional skills	**PS2.** Development and interpretation of technical, economic and managerial documentation. **PS4.** Development and evaluation of technical, economic and financial flows at business level, management of technical, economic and financial phenomena. **PS6.** Management and control of companies and study program specific processes: project and enterprise management in the electrical, electronic and energy field
Transversal skills	**TS2.**Identification of the roles and responsibilities of each member of a pluri-disciplinary team and the application of efficient work and relational techniques inside the team.

7. The objectives of the discipline(as resulting from the grid of the specific skills acquired)

7.1 The general objective of the subject	• Combining and selecting concepts, theories and methodsconcerning thecomputer-aided Engineering and Management, and operating thereof in professional communication. • Adequate use of standard criteria and methods for assessing uncertain and at risk-business assets of a company in order to evaluate the quality, worth and limitations of the economic and financial process; • Elaboration of projects for the forecasting of the economic-financial flows making use of field specific principles and methods to ensure the profitability of the business; • Application of principles and methods such asmathematical analysis, synthesis, and modelling in the case of economic and financial phenomena, for the design of economic and financial flows typical to the economic field under qualified supervision; • Training students as future specialists needed in the information society; • Preparing economist-engineers for multidisciplinary research; • Training students in such to allow them to adapt easily to the fast-pace changes taking place at the technological and managerial level in today's economy; • Implementing and substantiating the team notion by development of team projects.
7.2 Specific objectives	• Assessment of the status, performances and development perspectives of the enterprise by using analysis and synthesis methods as indispensable tools for research of economic-financial processes and phenomena. • Acquiring the analysis methodology, finding the correlations between the economic-financial processes and phenomena, the overall assessment of the enterprise activity and the diagnosis of its status and functioning as a system. • Interpretation of phenomena based implicitly or explicitly on a presentation system and on a model, and the identification of the structure thereof and of the constituent parts, and finding the causal relations between the components;finding the potential and opportunitiesof an enterprise in order to improve the consistency of important decision making for the viability and evolution of the enterprise.

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations

Chapter 1. Theoretical and methodological bases of economic-financial analysis: Content and conceptual approaches on economic-financial analysis. Typology of economic-financial analysis.	Free exposure, with the presentation of the course throughthe video projector andon the board	**2h**
Chapter 2. Stages of the economic and financial analysis process, and the factors that determine state changes of the processes and economic&financial phenomena. The system of indicators and equilibrium and efficiency correlations. Basic methods and techniques used in economic and financial analysis.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 3. Analysis of the production and salesactivity: analysis of the dynamic and static ratio between the indicators, analysis of the physical production, analysis of the realization of the company' manufacturing program on assortments and as a whole.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 4. Analysis of the production structure, analysis of the production quality and of its economic and financial implications, analysis of the turnover.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 5. Analysis of production costs: analysis of expenses related to enterprise revenues, analysis of operating expenses, analysis of expenses incurred per RON 1,000 turnover, analysis of variable expenses.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 6. Analysis of the dynamics and structure of variable expenditures, analysis of fixed expenditures, analysis methods in the case of the main categories of expenditures**.**	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 7. Profitability analysis: conceptual approaches regarding the profitability of the enterprise, profit analysis, profitability analysis	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 8. Analysis of the financial situation and of the assetsand liabilities of an enterprise: conceptual delimitations regarding the analysis of the company' financial situation, the assets and liabilities, and its objectives, the fundamentalsin the analysis of the company financial situation, and of its assets and liabilities.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 9. Analysis of human resources management, dynamics of the total staff by categories, analysis of staff stability, analysis of staff qualification and effective use thereof.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 10. Analysis of the management of fixed assets: analysis of the technical potential dynamics and structure, analysis of the use of the technical potential.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**

Chapter 11. Analysis of material resources management: analysis of the supply market, analysis of the implementation of the supply schedule, economic and financial indicators.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 12. Analysis of the cash flows in the balance sheet. Calculation of liquidity ratios by expressanalysis. Factorial analysis of liquidity ratios.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 13. Analysis of cash flow. General assessment of cash flow. Factor analysis of cash flow.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Chapter 14. Analysis of the consistency between the cash flow and the financial results.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
		28h

Bibliography

1.Bătrâncea Ioan, Căinap Ioan, Pop Fănuţa, Bunduchi Raluca, Achim Monica), et all *"Analiza economico-financiară"*, "1 Decembrie 1918" University lecture, Didactica Series, Alba-Iulia, pp. 75-121, 1999;

2. Bătrâncea Ioan (coord.), Pop Fănuţa, Bunduchi Raluca, Achim Monica), *"Analiză financiară pe bază de bilanţ"*, Editura Presa Universitară Clujeană/Cluj University Press Publishing House, 2001, Cluj-Napoca, pp. 60-120, 2001, ISBN 973-8095-09-3, 256 p.;

3.Ivan Rica, Analiza economico-financiară, participant handbook/guide available on CD.

8.2 Academic laboratory/seminar	Teaching methods	No. of hours/ Observations
1. Analysis of the general situation of the enterprise's activity on the basis of correlations between the main economic &financial indicators	Debates on case studies with studentcontributions, exercises and problem solving.	**2h**
2. Quantitative analysis methods	Debates on case studies with studentcontributions, exercises and problem solving.	**2h**
3. Factor analysis of turnover and added value	Debates on case studies with studentcontributions, exercises and problem solving.	**2h**
4. Factor analysis of the average annual labor productivity and the average profit per employee	Debates on case studies with studentcontributions, exercises and problem solving.	**2h**
5. Factor analysis of total expenses, variable expenses and fixed expenses incurred per RON 1,000 turnover	Debates on case studies with studentcontributions,	**2h**

	exercises and problem solving.	
6. Analysis of depreciation and interest related expenses incurred per RON 1,000 turnover	Debates on case studies with studentcontributions, exercises and problem solving.	**2h**
7. Structural and factor analysis of profit at enterprise level	Debates on case studies with studentcontributions, exercises and problem solving.	**2h**
8. Factor analysis of profitability rates	Debates on case studies with studentcontributions, exercises and problem solving.	**2h**
9. Analysis of the structure rates of the balance sheet assets and liabilities of the company	Debates on case studies with studentcontributions, exercises and problem solving.	**2h**
10. Analysis of the correlation between working capital, working capital needs and net treasury	Debates on case studies with studentcontributions, exercises and problem solving.	**2h**
11. Analysis of a company cash flowsolvency, as well as of itsfinancialbalancethrough the installment method	Debates on case studies with studentcontributions, exercises and problem solving.	**2h**
12. Factor analysis of the average turnover of current assets	Debates on case studies with studentcontributions, exercises and problem solving.	**2h**
13. Analysis of cash flow.	Debates on case studies with studentcontributions, exercises and problem solving.	**2h**
14. Analysis of the balance sheet.related cash flow	Debates on case studies with studentcontributions, exercises and problem solving.	**2h**
		28h

Bibliography

7. Silaghi H.,SpoialĂ V.,Costea C. - *Acţionărielectrice* , Îndrumar de laborator, Lito Universitateadin Oradea, 2008
8. VioricaSpoială, Helga Silaghi, DragoşSpoială – Acţionărielectrice. Indrumator de laborator. Universitateadin Oradea, ISBN 978-606-10-1432-3, Ediţie CD-ROM, 140 pag, 2014

8.3 Academic project	Teaching methods	No. of hours/ Observations
Design of the lifting mechanism of a general purpose overhead crane	Students receive the project theme and design methodology and under the guidance of the teacher perform the project stages	14h

Bibliography 1. Căinap Ioan, Bătrâncea Ioan, Pop Fănuţa, ŞteliacNela, *"Analiza productivităţii muncii în societăţile comerciale"*, Dacia PublishingHouse, Cluj-Napoca, 1997, ISBN 973-35-0703-2 160 p. 2. Bătrâncea Ioan (coord.), Pop Fănuţa, Bunduchi Raluca, Achim Monica), *"Analiză financiară pe bază de bilanţ"*, Editura Presa Universitară Clujeană/Cluj University Press PublishingHouse, 2001, Cluj-Napoca, pp. 60-120, 2001, ISBN 973-8095-09-3, 256 p.; 3. Ivan Rica, Analiza economico-financiară, participanthandbook/guideavailableon CD.		
8.3 Project	Teaching methods	No. of hours/ Observations

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the study program

- The content of the academic discipline can be found in the curriculum of the Economic Engineering specialization in the electrical, electronic and energetic field, and in other university centers that accredited these specializations.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark/grade
10.4 Course	-In order for a student to obtain the pass mark (5)s/he is required to know the fundamental notions required in the studysubjects, without presenting them in detail. -In order for the student to obtain the maximum mark (10)s/he is required to make the proof of a thorough knowledge of all study subjects.	**Midterm evaluation** Each student receives for solving a form with 3 theoretical subjects of theory andpractical applications (totalling 10 points). The evaluation can be heldface to face or online	70 %
10.5 Laboratory			
10.6 Seminar	- In order for a student to obtain the pass mark (5)s/he is required to recognize the steps used in the making of the practical applications, without presenting them in detail; -In order for the student to obtain the maximum mark (10)s/he is required to make the proof of a thorough knowledge of all practical applications.	**Practical application** Students sit in a test and are given a grade during each seminar. Each student also is granted a grade for his/her activity at seminar throughout the entire semester. It results an average mark for the seminar. The evaluation can be held face to face or online.	30%
10.7 Minimum performance standard: **Course:** – Development of a professional project specific to the Engineering and Management discipline using specific software systems and databases. – Designing economic-financial processes at business level, for a given situation; – Development of projects aiming and ensuring the management of the enterprise active in the electrical, electronic and energetic businesses.			

Seminar:

– Development, in a responsible manner and under qualified supervision, of projects conceived tosolve some of the domain specific problems, with the accurate evaluation of the workload, of available resourcesandof time necessary to complete the projects while considering therisks they entail, and observing the application ofprofessionaldeontology and ethical norms in the field, as well as the occupational safety and health rules.

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	Department of Control Systems Engineering and Management
1.4 Field of study	Engineering and management
1.5 Study cycle	Bachelor
1.6 Study program/Qualification	Economic Engineering in Electric, Electronic and Energetic Field

2. Data related to the subject

2.1 Name of the subject		**International Law**					
2.2 Holder of the subject		**Lect. PhD jr. Anca PĂCALĂ**					
2.3 Holder of the academic seminar/laboratory/project		**Lect. PhD jr. PĂCALĂ**					
2.4 Year of study	III	2.5 Semester	6	2.6 Type of the evaluation	Examination	2.7 Subject regime	DD

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

3.1 Number of hours per week	2	of which: 3.2 course	2	3.3 academic seminar/laboratory/project	-
3.4 Total of hours from the curriculum	28	Of which: 3.5 course	28	3.6 academic seminar/laboratory/project	-
Distribution of time					47h
Study using the manual, course support, bibliography and handwritten notes					28
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					16
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					
Tutorials					
Examinations					3
Other activities.					

3.7 Total of hours for individual study	**47**
3.9 Total of hours per semester	**75**
3.10 Number of credits	3

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses - The course can be held face to face or online
5.2.for the development of the academic laboratory/project	

6. Specific skills acquired

C3. Companies planning, programming and management, as well as associated logistic networks, and also, follow the production. **C6.** Management and control the companies and processes of the specific study program: project management and company management for electric, electronic and energy engineering field.
CT1. Responsibly apply the principles, norms and values of professional ethics in order to achieve the goals and identify the objectives, the available resources, the steps to be done and time spent for finishing the works, the deadlines and the risks involved. **CT2.** Identify the roles and responsibilities of each member of a pluri-disciplinary team and apply efficient work and relational techniques inside the team.

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	Familiarizing students with notions from unstudied fields, knowledge, understanding, explanation and interpretation of the main provisions contained in normative acts of major importance for any graduate of higher education and especially for those in the field of Engineering Sciences
7.2 Specific objectives	The course of international trade law aims to familiarize students with the fundamental notions related to international trade: regulation, participants in international trade relations, international trade arbitration. The research of these issues necessarily involves a multidisciplinary approach, international trade law being by its specificity a multidisciplinary matter, a field of connection and interference between institutions and concepts belonging to different segments of private law such as civil law, commercial law, private international law or even civil procedural law. The development of the science of international trade law becomes a priority for legal scientific research in Romania, and increasing the share of this subject as a study discipline becomes a priority for higher education.

8. 8. Contents

8.1.Course	Teaching methods	No. of hours/ Observations
International trade low. Concept. Specific	Free exposure, with the presentation of the course with video projector, on the board or online	2h
Legal report on international trade. Participants in the legal report on international trade. Content of the legal report on international trade. The object of the legal report on international trade. Sources of international trade law.	Free exposure, with the presentation of the course with video projector, on the board or online	4h
International trade arbitration. Concept; varieties. General features of international commercial arbitration. The legal nature of international commercial arbitration. Law applicable to international commercial arbitration. Arbitration Convention. International commercial arbitration in Romania	Free exposure, with the presentation of the course with video projector, on the board or online	4h
International trade contract in general. Concept; legal characters; classification. Elements of the	Free exposure, with the presentation of the course	4h

international trade contract. Form and language of the international trade contract. Law applicable to the international trade contract.	with video projector, on the board or online	
Formation of the international trade contract. Pre-contractual approaches. Offer to contract. Accepting the offer. Time to complete the international trade contract.	Free exposure, with the presentation of the course with video projector, on the board or online	6h
Content of the international trade contract. Clauses required in the international trade contract. Clauses that evoke strictly legal aspects regarding the contract. Insurance clauses designed to avoid or neutralize risks. Insurance clauses intended to counteract foreign exchange risks. Insurance clauses intended to counteract non-currency risks. Force majeure clause. Other clauses encountered in the international trade contract.	Free exposure, with the presentation of the course with video projector, on the board or online	4h
Effects of the international trade contract. Specific effects of synallagmatic contracts. Execution of international trade contracts.	Free exposure, with the presentation of the course with video projector, on the board or online	4h

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2. O. Căpăţână, B. Ştefănescu, „Tratat de dreptul comerţului internaţional”, Ed. Academiei, vol. I, 1985, vol.II, 1987.
3. Costin, Mircea N. Dreptul comerţului internaţional: vol. 1: Partea generală. Bucureşti: Lumina Lex, 1994.
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5. Mazilu, Dumitru. Dreptul comerţului internaţional: Partea generală: Curs. Bucureşti: Lumina Lex,1999.
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7. Sitaru, Dragoş Alexandru. Dreptul comerţului internaţional: Tratat: partea generală. Bucureşti: Lumina Lex, 2004.
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8.2 Academic seminar/laboratory/project	Teaching methods	No. of hours/ Observations

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline can be found in the curriculum of Economic Engineering in Electric, Electronic and Energetic Field and other university centers that have accredited these specializations (Technical University of Cluj-Napoca, "Politehnica" University of Timisoara, etc.) and knowledge of the types of law is a stringent requirement of employers in the field.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods The evaluation can be done face-to-face or online	10.3 Percent from the final mark
10.4 Course	Minimum required	**Oral examination**	100 %

	conditions for passing the exam (mark 5): in accordance with the minimum performance standard it is necessary to know the fundamental notions required in the subjects, without presenting details on them For 10: thorough knowledge of all subjects is required	Students receive for solving each a form with 2 subjects of theory and an application.	

10.6 Minimum performance standard:

Course: - knowledge of the essential notions in the field of international trade law – ability to reproduce the specific clauses of an international trade contract – ability to know and recognize the extent of one's rights and obligations as a contractor

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject			**Logistics management**				
2.2 Holder of the subject			**Prof. PhD eng. Gabriela Tonţ**				
2.3 Holder of the academic laboratory/project			**Lect. PhD eng. Kovedi Zoltan**				
2.4 Year of study	**III**	2.5 Semester	**6**	2.6 Type of the evaluation	**Vp**	2.7 Subject regime	**DD**

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

3.1 Number of hours per week	**3**	of which: 3.2 course	**2**	3.3 academic laboratory	**1**
3.4 Total of hours from the curriculum	**42**	Of which: 3.5 course	**28**	3.6 academic laboratory	**14**

Distribution of time	hours
Study using the manual, course support, bibliography and handwritten notes	38
Supplementary documentation using the library, on field-related electronic platforms and in field-related places	22
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	32
Tutorials	2
Examinations	4
Other activities.	

3.7 Total of hours for individual study	**33**
3.9 Total of hours per semester	**75**
3.10 Number of credits	**3**

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses - The course can be held face to face or online
5.2.for the development of the academic laboratory/project	- Mandatory presence at all laboratories; - The laboratory/project can be carried out face to face or online - Students come with the observed laboratory works - A maximum of 2 works can be recovered during the semester (30%); - The frequency at laboratory hours below 70% leads to the restoration of the discipline
6. Specific skills acquired	

Professional skills	**C1.**Make calculations, demonstrations and applications in order to solve specific engineering and management tasks, based on knowledge achieved from fundamental sciences and engineering sciences. **C3**.Planning, scheduling and management of enterprises, as well as associated logistics networks, as well as production monitoring
Transversal skills	**TC1.**Responsibly apply the principles, norms and values of professional ethics in order to achieve the goals and identify the objectives, the available resources, the steps to be done and time spent for finishing the works, the deadlines, and the risks involved. **TC2.**Identify the roles and responsibilities of each member of a pluri-disciplinary team and apply efficient work and relational techniques inside the team.

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	Deepening students' knowledge regarding the principles, basic theories of Logistics Management
7.2 Specific objectives	The course aims to form the discernment necessary for the objective assessment and retention by students of the issue of logistics management The laorator familiarizes students with practical aspects of logistics management at the business level

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
1. Content and components of logistics 1.1. The concept of logistics and the relationship between physical distribution and logistics 1.2. The driving factors of the logistic evolution 1.3. The mix of logistics activities	Free exposure, with the presentation of the course with video projector, on the board or online	2 h
2. Current issues in the production system 2.1JIT 2.2 Kaizen 2.3 Halonic systems 2.4 Neural systems	Free exposure, with the presentation of the course with video projector, on the board or online	4h
3. Production stocks 3.1. The notion, content and functions of production stocks 3.2. The principles that must be taken into account when forming stocks 3.3. Stock categories 3.4. Oversized stocks - negative economic causes and effects 3.5. Inventory optimization methods 3.6 Modern methods for tracking and analyzing production stocks: maximum-minimum method, ABC method	Free exposure, with the presentation of the course with video projector, on the board or online	6 h
4. Management of stock systems 4.1. Stocks and their functions 4.2. The costs of a stock system 4.3 Determining the size of the supply lot: the simple-ideal classic model; the classic model with finite supply cadence; the model when several types of products are processed on a machine;	Free exposure, with the presentation of the course with video projector, on the board or online	10 h

the optimal batch for products with limited demand season; the optimal lot in the presence of aggregate constraints; considerations on subdivision in multi-stage systems Production stocks		
5. Serial production management 5.1. Planning the necessary components 5.2. Manufacturing cycle 5.3. Manufacturing ordering	Free exposure, with the presentation of the course with video projector, on the board or online	4 h
6. Product distribution 6.1. Distribution - the basic component of product marketing 6.2. Distribution channels for production	Free exposure, with the presentation of the course with video projector, on the board or online	2 h
1. Gabriela Tont, Managementul logisticii, note de curs, 2016 2. Abrudan, I si Candea, D – Manual de inginerie economica. Ingineria si managementul sistemelor de productie, Ed Dacia, Cluj Napoca 2002. 3. Abrudan, I, Lungu, F, Sucala V- Proiectarea sistemelor de stocuri, Ed Dacia, Cluj Napoca, 2002		
8.2 Academic laboratory	Teaching methods	No. of hours/ Observations
1. Logistics management, specific issues of the discipline 2. Methods and supply costs - problems, case studies 3. Design of warehouses - problems, case studies 4. Location of warehouses - problems, case studies 5. Stocks and their functions - problems, case studies 6. Modern methods for tracking and analyzing stocks - problems, case studies 7. Distribution channels for production	Students receive laboratory papers at least one week in advance, study them, inspect them, and take a theoretical test at the beginning of the laboratory. Then, the students carry out the practical part of the work under the guidance of the teacher	2 h 2 h 2 h 2 h 2 h 2 h 2 h
Bibliography 1. Gabriela Tont, Managementul logisticii, note de curs, 2016 2. Abrudan, I si Candea, D – Manual de inginerie economica. Ingineria si managementul sistemelor de productie, Ed Dacia, Cluj Napoca 2002. 3. Abrudan, I, Lungu, F, Sucala V- Proiectarea sistemelor de stocuri, Ed Dacia, Cluj Napoca, 2002		

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline can be found in the curriculum of Economic engineering in the electrical, electronic and energy field and other university centers that have accredited

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods The evaluation can be done face-to-face or online	10.3 Percent from the final mark
10.4 Course	Minimum required conditions for passing the exam (mark 5): in	**Written exam** Students receive for solving each a form with	60 %

	accordance with the minimum performance standard it is necessary to know the fundamental notions required in the subjects, without presenting details on them For 10: thorough knowledge of all subjects is required	3 subjects of theory and an application.	
10.5 Laboratory	Minimum required conditions for promotion (grade 6): identification of the elements of the system under consideration; establishing functional links between the system and its components; the operating block scheme – system downtime is drawn up. For 10: the implementation of the logical reliability scheme; verification of compliance with the initial conditions in the reliability scheme (connection scheme);	**Test + practical application** At each laboratory students receive a test and a grade. Each student also receives a grade for laboratory work during the semester and for the laboratory work file. This results in an average for the laboratory.	40%
10.6 Minimum performance standard: Course: After completing the discipline students will be able to: Demonstration of the ability to understand and apply the studied theoretical concepts - Designing economic-financial processes specific to logistics management at business level, for a given situation - Elaboration of projects that aim at locating an investment objective - Participation in at least half of the courses. Laboratory: - Responsible realization, in conditions of qualified assistance, of projects for solving some problems specific to the field, with the correct evaluation of the workload, of the available resources, of the necessary completion time and of the risks, in conditions of application of deontological and ethical norms. professional in the field, as well as occupational safety and health. - Participation in all laboratory work.			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Datarelated to thesubject

2.1 Name of the subject		**Marketing**					
2.2 Holder of the subject		**LecturerRica Ivan, PhD Econ.**					
2.3 Holder of the academic laboratory/project		**Lecturer Rica Ivan, PhD Econ.**					
2.4 Year of study	**III**	2.5 Semester	**5**	2.6 Type of the evaluation	**Exam**	2.7 Subject regime	**Compulsory**

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

3.1 Number of hours per week	**4**	of which: 3.2 course	**2**	3.3 academic laboratory/project	**2**
3.4 Total of hours in the curriculum	**56**	of which: 3.5 course	**28**	3.6 academiclaboratory/project	**28**
Distribution of time					
Study using the manual, course handbook/guide, bibliography and handwritten notes					28
Supplementary documentation work using the library, on field-related electronic platforms and in field-related places					10
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					25
Tutorials					2
Examinations					4
Other activities.					

3.7 Total of hours for individual study	**69**
3.9 Total of hours per semester	**125**
3.10 Number of credits	**5**

4. Pre-requisites(where applicable)

4.1 related to the curriculum	Knowledge regarding of system the quality and reliability, management, mathematical statistics and probabilities.
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses; - The course can be held face to face or online.
5.2.for the development of the academic laboratory/project	- Mandatory attendance at all seminars; - Students attends the seminar with reference summary papers; - A maximum of two works can be recovered throughout the semester (30%);

	- A seminar attendance rate below 70% obliges the studentto resume the course; - The seminar/laboratory/project can be held face to face or online.

6. Specific skills acquired	
Professional skills	**S2.** Elaboration and interpretation of technical, economic and managerial documentation **S4.** Elaboration and evaluation of business related technical, economic and financial flows, the management of technical, economic and financial phenomena.
Transversal skills	**TS 2.** Assigning roles and responsibilities in a multi-specialized decision-making team and assigning tasks, with the application of relationship techniques and efficient work within the team.

7. The objectives of the discipline(as resulting from the grid of the specific skills acquired)

7.1 The general objective of the subject	• The course aims to present the marketing specific concepts, to making students familiar with the use of marketing research tools. The objective of the course is to make students aware of the needs of the buyer/ consumer/ user and to form a culture in the field of marketing in order to develop the students' capacity and skills necessary for the performance analysis of an organization.
7.2 Specific objectives	**Specific skills:** **1. Knowledge and understanding (knowledge and appropriate use of discipline-specific notions)** – Knowledge and understanding of fundamental concepts used in marketing; – Knowledge of theories and trends in marketing, especially of new developments; – Knowledge of marketing research methods; – Knowledge of the rules valid for marketing activity within organizations. **2. Explanation and interpretation (explanation and interpretation of some ideas, projects, processes, as well as of the theoretical and practical contents of the discipline)** – Understanding the markets and consumer behaviour; – From theory to practice through market research; – Making assumptions regarding the key elements in marketing; – Transfer of marketing principles and models in the current Romanian context; – Ability to argue one's own vision for implementing a marketing plan. **3. Instrumental and applicative skills (design, management and evaluation of specific practical activities; use of marketing research and practical methods, techniques and tools):** – Student should become aware of the importance of the processes in the field of

	marketing and in view of its social and professional success; – Student should be able to recommend the adaptation of certain strategies to the state of play on the market, to argue the need for push and pull strategies in a certain context; – Student should find and characterize the consumers of an organization; – Consumer segmentation; – Learning of the main elements in making commercial offers; – Development of marketing strategies; making of marketing plans for a certain organization, including specific projects. **4. Attitudinal skills (manifestation of a positive and responsible attitude towards the science).** – Building a correct perspective regarding the finality of the approach of marketing specialists within organizations; – Mastering professional ethics; • Approaching the activity from the perspective of marketing philosophy –the ownership of the marketing orientation of various organizations.

8. Contents

8.1 Course	Teaching methods	No. of hours/ Observations
1. Marketing framework and aspects. The notion of marketing. Marketing fundamentals. 1.1 The role of marketing as a managerial practice. Features of the marketing concept. 1.2 Scope of marketing. Trends in marketing concept. Analysis. Strategy. Tactics.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
2. The marketing environment and its analysis. 2.1. Marketing environment. 2.1.1. Marketing macro-environment. 2.1.3. Socio-cultural environment. 2.2. Economic environment. 2.2.1. The natural& technological environment. 2.2.2. The political-legislative environment. 2.3. Information environment. 2.4. The micro-environment of marketing. 2.4.1. The internal environment of the company. 2.4.2. The company and its nature. 2.5. The external microenvironment of the company.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
3. Basic characteristics of consumer behaviour 3.1 Behaviour of the individual consumer. 3.1.1. Decision making in when buying. 3.1.2. Types of purchasing situations. Shopping categories. Buyers' roles. Organizational consumer behaviour. Organizational culture. 3.2. Prerequisites for success in marketing.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**

4. Measuring the consumer's reaction to market specific processes. 4.1. The notion of elasticity. Income elasticity of demand. 4.2. The relationship between the demand in monetary expression and the quantitative demand. 4.3. Consequences of price elasticity and marginal costs on production and marketing. 4.4. The notion of product quality.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
5. Market analysis. 5.1. Functional approach. Market functions. 5.2. Marketing intermediaries. 5.3. Market performance analysis. 5.4. Marketing efficiency. Consumers and the market.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
6. Marketing research. 6.1. Typology of marketing research. 6.2. Marketing information system. 6.3. Criteria for information assessment. 6.4. The process of marketing research. Defining the problem. Situation analysis. Obtaining information on the specific issues. Data interpretation. Problem solving.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
7. Targeted marketing. The concept of targeted marketing (Analysis. Strategy. Tactics. Management).Opportunities and risks entailed by a situation. Finding out opportunities with the help of the needs hierarchy. 7.1. Market segmentation - a component of targeted marketing. Basic types of segmentation. Entering on a market segment. 7.2. Evaluated market segmentation techniques. Choosing the target market. How to position on micro-markets.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
8. Analysis of competitive behaviour. The importance ofanalysing the competition. 8.1. The structure and performance of the competition. The monopoly. The oligopoly. The Porter's five forces model. 8.2. Competitive strategies. Market leader strategies. Competition assessment. 8.3. Adopting competitive behaviour. Variants of competitive behaviourwith focus on the customer. Competitive behaviours of producers.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
9. Marketing strategy. Objectives. Action programs. Expected profits and expenses. Ways of control.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
10. Marketing strategy. 10.1. Generic strategies. Market share strategies. Product / market based strategies. Competition-based strategies. 10.2. Techniques for approaching marketing strategies. Boston Consulting Group (BCG) model. General Electric Model - Mc Kinsey. Royal Dutch-Shell (KDS) model.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
11. Forecasting the demand for consumer goods. 11.1. Consumer demand related variables. 11.2. Methods of forecasting the demand for consumer goods.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**

12. Marketing plan. 12.1. The characteristics and content of a marketing plan. Introductory presentation. Current market situation. 12.2. Analysis of the opportunities and problems that a company is facing with.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
13. Marketing research. 13.1. The scope of marketing research. The marketing research process. 13.2. Defining the marketing problem and the objectives of the marketing research. Elaboration of the marketing plan. 13.3. Marking research modalities. Research tools.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
Sampling. 14.1. Collecting information. Information analysis. Presentation of conclusions. 14.5. Use of marketing research. The supportsystem in decisions making in marketing.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
		28

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[1] Gabriela Tonţ − *Fiabilitatea sistemelor*, Oradea University Press, ISBN 973-9453-54-3, 215 pg., 2002;

[2] Kotler, Ph., *Managementul marketingului*, Teora Publishing House, Bucharest, 1997.

[3] Gabriela Tonţ − *Calitatea în electrotehnică*, ISBN 973- 613-544-6, Oradea University Press, 151 pg., 2004.

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[10] Balaure Virgil (coord.), Adăscăliţei Virgil, Bălan Carmen, Boboc Ştefan, Cătoiu Iacob, Olteanu Valerică, Pop Nicolae Alexandru, Teodorescu Nicolae, *Marketing*, Editura Uranus Publishing House, Bucharest, 2003.

[11] Gabriela Tonţ, Nicolina Maghiar, Marketing, course handbook, 2016

8.2 Academic laboratory/seminar	Teaching methods	No. of hours/ Observations
1. Analysis of environmental factors - discussions, tests. Target marketing. Market segmentation. Choice of market segments. Market positioning of a company.	Students receive the bibliography for the preparation of seminar works at least one week in advance in order to study it and take notes. Students solve specific problems	**4h**
2. Consumer analysis and consumer satisfaction - case study. Competitive strategies. Leaders' strategies. The strategies of the main competitor. Followers' strategies. Niche marketing.		**4h**
3. Product and price strategies. Product strategies. The product & the product mix. The brand. Strategies in various phases of aproduct life cycle.		**4h**
4. Pricing strategies. Objectives in setting the price. Pricing strategies. Adapting prices to the conditions of the marketing		**4h**

environment. The promotion mix. Communication in marketing. Elaboration of the promotion plan.	under the guidance and supervision of the professor/lecturer.	
5. The project of a promotion campaign - case study.		**4h**
6. Marketing in engineering.		**4h**
7. Organizing a marketing and communication department.		**4h**

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[3].Gabriela Tonţ, D.G. Tonţ − *Calitatea în electrotehnică*, laboratory, Oradea University Press, 90 pg., 2004.
[4] Gabriela Tonţ, Nicolina Maghiar, Marketing, course handbook, 2016

	Teaching method	Observations

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the study program

- The content of the academic discipline can be found in the curriculum of the Economic Engineering in electronic, engineering and energy fields of specialization in other university centers that accredited these specializations (Technical University of Cluj-Napoca, "Politehnica" University of Timisoara, etc.), and knowledge of marketing applied in engineering is a stringent requirement of employers in the field (Celestica, Faist Mekatronics, Comau, GMAB, etc.).

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark/grade
10.4 Course	-In order for a student to obtain the pass mark (5)s/he is required to know the fundamental notions required in the study subjects, without presenting them in detail. -In order for the student to obtain the maximum mark (10) s/he is required to make the proof of a thorough knowledge of all study subjects.	**Midterm evaluation** Students sit in four knowledge assessment tests during the semester containing questions and practical applications (with a maximum total score of 10 points) in the weeks 4, 8, 12, 14 of the seminar. The evaluation can be held to face or online.	70 %
10.6 Seminar	- In order for a student to obtain the pass mark (5) s/he is required to recognize the steps used in the making of the practical applications, without presenting them in detail; -In order for the student to obtain the maximum mark (10) s/he is required to make the proof of a thorough	**Practical application** Students sit in a test and are given a grade during each seminar. Each student also is granted a grade for his/her activity at seminar throughout the semester. It results an average mark for the seminar. The evaluation can be held face to face or online.	30%

	knowledge of all practical applications.		

10.7 Minimum performance standard:

-Course:

– *Knowledge* of the main theoretical notions used; understanding and developing marketer skills;
Understanding the marketing functioning mechanism;

- Explanation and interpretation (explanation and interpretation of some ideas, processes) explanation and interpretation (explanation and interpretation of some ideas, projects, processes, as well as of the theoretical and practical contents of the discipline). Understanding market trends and the ways consumers report to these trends.
- Understanding the competitive environment; understanding consumer behavior; finding market segments; designing the marketing strategy; elaboration of the marketing plan; developing the relationship with consumers; elaboration of promotion programs.
- Attendance of at least half of the courses.

Seminar:

- *Instrumental* - *application*, design, management and evaluation of specific practical activities:
Use of methods, techniques and tools for marketing research and application.
Acquiring the necessary tools for planning a marketing campaign.
Getting familiar with and application of documents and working tools needed in planning a campaign.
Attendance at all seminar/laboratoryclasses.

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Control systems engineering**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic field/ Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject		**Microprocessor Systems**					
2.2 Holder of the subject		**Lect. PhD eng.** Kovendi Zoltan					
2.3 Holder of the academic laboratory/project		**Lect. PhD eng.** Kovendi Zoltan					
2.4 Year of study	III	2.5 Semester	6	2.6 Type of the evaluation	VP	2.7 Subject regime	DD

(I) Impusă

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

3.1 Number of hours per week	4	of which: 3.2 course	2	3.3 seminar/laboratory/project	-/2/-
3.4 Total of hours from the curriculum	56	Of which: 3.5 course	28	3.6 seminar/laboratory/project	-/28/-
Distribution of time					44 hours
Study using the manual, course support, bibliography and handwritten notes					20
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					6
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					14
Tutorials					
Examinations					4
Other activities.					

3.7 Total of hours for individual study	**44**
3.9 Total of hours per semester	**100**
3.10 Number of credits	**4**

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditionari)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses - The course can be held face to face or online

5.2.for the development of the academic laboratory/project	- Mandatory presence at all laboratories; - The laboratory/project can be carried out face to face or online - Students come with the observed laboratory works - A maximum of 4 works can be recovered during the semester (30%); - The frequency at laboratory hours below 70% leads to the restoration of the discipline

6. Specific skills acquired	
Professional skills	**C1.** Using knowledge of mathematics, physics, measurement, technical graphics, mechanical engineering, chemical, electrical and electronic engineering in control systems engineering **C5.** Application development and implementation of algorithms and automatic management structures, using the principles of project management, programming environments and technologies based on microcontrollers, signal processors, programmable logic controllers, embedded systems
Transversal skills	

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ Assimilation by students of the necessary notions for the design and use of micrprocessor systems. In this sense the discipline approaches micrprocessor systems, hardware structures and their applications. The family of Intel microprocessors (I8086, Pentium I-IV), memory and interface circuits are shown. ▪ The laboratory works study the charactheristics and operation of microprocessor and support circuits with the experimentation of the operation and charactheristics of support circuits with the elaboration and running programs in Assembly language for a microsystem with 80C51 microcontroller
7.2 Specific objectives	▪ Creating the ability to design and use microprocessor systems ▪ Familiarizing students with the arhitecture of the microprocessor ▪ Identifying and exploiting the resources of a microprocessor system ▪ Highlighting the pecularities of communication in microprocesoor systems and input-output operations ▪ Creating the skills to design a hardware system witch microprocessos or microcontroller

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
Chapter 1. MICROPROCESSORS: 1.1. Introductory aspects; 1.2. Evolution and charactheristics of microprocessors.	Free exposure,with the presentation of the course with video projector, on the	2 hours

	board or online	
Chapter 2 2. MICROPROCESSOR I8086: 2.1. Configuration of the terminals. 2.2. Internal structura of the microprocessor I8086.	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 2. MICROPROCESSOR I8086 (continuation): 2.3. Internal registers of the microprocessor I8086.	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 2. MICROPROCESSOR I8086 (continuation): 2.4. Connecting the main memory in I8086 systems	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 2. MICROPROCESSOR I8086 (continuation): 2.5. Input and output operations in I8086 microsystems	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 3. MICROPROCESSOR INTEL PENTIUM, PENTIUM MMX, PENTIUM II, PENTIUM III, PENTIUM IV: 3.1. Microprocessor Intel Pentium.	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 3. MICROPROCESSOR INTEL PENTIUM, PENTIUM MMX, PENTIUM II, PENTIUM III, PENTIUM IV (continuation): 3.2. Microprocessor Intel Pentium MMX.	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 3. MICROPROCESSOR INTEL PENTIUM, PENTIUM MMX, PENTIUM II, PENTIUM III, PENTIUM IV (continuation): 3.3. Microprocesorul Intel Pentium II.	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 3. MICROPROCESSOR INTEL PENTIUM, PENTIUM MMX, PENTIUM II, PENTIUM III, PENTIUM IV (continuation): 3.4. Microprocessor Intel Pentium III. 3.5. Microprocessor Intel Pentium IV.	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 3. MICROPROCESSOR INTEL PENTIUM, PENTIUM MMX, PENTIUM II, PENTIUM III, PENTIUM IV (continuation): Microprocessor Intel Dual-Core, Quad-Core.	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 4. Motherboards: 4.1. Design modes; 4.2. Types of motherboards.	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 5. Main memory: 5.1. Primary and secondary storage systems; 5.2.	Free exposure,with	2 hours

ROM memory; 5.3. RAM memory; 5.4. Cache memory; 5.5 Memory circuit encapsulation techniques	the presentation of the course with video projector, on the board or online	
Chapter 6. Sets of chips and support circuits: 6.1. Chipsets; 6.2. Chipset functions; 6.3. System controller; 6.4. Controller for peripherial devices; 6.5. Memory controller	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 7. BUS Extensions 7.1. BUS functions ; 7.2. ISA şi EISA 7.3. VESA; 7.4. PCMCIA; 7.5. PCI.	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours

Bibliography

1. Gergely E., Sisteme cu microprocesoare, Note de curs, http://egergely.webhost.uoradea.ro/materiale.html .
2. Hennessy J.L., Patterson D.A., Computer Architecture. A Quantitative Approach, Elsevier, USA, 2007.
3. Mueller S., Zacker C., PC depanare şi modernizare, Editura Teora, 2007.
   Balch M., Complete digital design. A Comprehensive Guide to Digital Electronics and Computer System Architecture, McGraw-Hill, USA, 2003.
5. Gergely E., ş.a., Sisteme cu microprocesoare, partea I, Curs, Lito Universitatea din Oradea, 1999.

8.2 Academic laboratory	Teaching methods	No. of hours/ Observations
1. Presentation of the laboratory, of the labor protection norms and of the conventional signs.	Summary of the papers and practical demonstration using the equipments from the laboratory	2 ore
2. Notions of boolean algebra, representation and minimization of logical functions by analitical methods and Veith-Karnaugh diagrams	Summary of the papers and practical demonstration using the equipments from the laboratory	4 hours
3. Study of multiplexors	Summary of the papers and practical demonstration using the equipments from the laboratory	2 hours
4. Study of decoders and demultiplexors	Summary of the papers and practical demonstration using the equipments from the laboratory	2 hours
5. Study of bistabiles JK asynchronous, synchronously, master-slave and type T	Summary of the papers and practical demonstration using the equipments from the laboratory	2 hours
6. Study of synchronous and asynchronous counters	Summary of the papers and practical demonstration using the equipments from the laboratory	2 hours
7. Study of registers	Summary of the papers and practical demonstration using the equipments from the laboratory	2 hours
8. Description of the microcontroller INTEL 80C51.	Summary of the papers and practical demonstration using the equipments from the laboratory	2 hours
9. Studying the way of work with mon552mv.exe.	Summary of the papers and practical demonstration using the equipments from the laboratory	2 hours
10. Internal memory, registers with special functions (SFR) at microcontroller 80C51.	Summary of the papers and practical demonstration using the equipments from the laboratory	2 hours
11. Counters/Timers T0 and T1 of microcontrollers 80C51	Summary of the papers and practical demonstration using the equipments from the laboratory	4 hours
12. Closing the situation of the laboratory	Summary of the papers and practical demonstration using the equipments from the laboratory	2 hours

Bibliography
1. Gavriş M., ş.a. Sisteme cu microprocesoare, Îndrumător de laborator, Universitatea din Oradea, 1996
2. Nagy Z.T., Codoban A. Gergely E.I., Microcontrolere în automatizări, Îndrumător de laborator, Universitatea din Oradea, 2005.
3. Murdocca M.J., Heuring V. P., Principles of computer architecture, Prentice Hall, 2000.
4. Rosch W. L., Totul despre hardware, Editura Teora, 1999.

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline is in accordance with other university centers from the country and abroad. For a better adaptation to the requirements of the field of work, meetings were held both with representatives of the socio-economic environment and with professors with similar fields of interest

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	- Minimum requirements for passing the exam**(note 5)**: In accordance with the minimum performance standard **- For 10 grade:** - thorough knowledge of the structure of microprocessor systems - thorough knowledge of microprocessor arhitecture; - thorough knowledge of microsystems memory transfers - thorough knowledge of communication between hierarchical levels in microprocessor systems - thorough knowledge of input-output operations	The evaluation can be done face-to-face or online	66,66%
10.5 Laboratory	- Minimum requirements for passing the exam**(note 5)**: In accordance with the minimum performance standard **- For 10 grade:** - thorough knowledge of the structure of the Intel 80C51microcontroller - thorough knowledge of the internal memory and registers of the Intel 80C51 microcontroller - thorough knowledge of the counters/timers of the Intel 80C51 microcontroller - thorough knowledge of Intel 80C51 microcontroller programming	The evaluation can be done face-to-face or online	33,33%

10.6 Minimum performance standard:

Course:

- knowledge regarding the structure of microprocessor systems
- knowledge of microprocessor architecture
- knowledge regarding myrosystems memory transfers
- knowledge of input-output operations

Laboratory:

- knowledge regarding the structure of the INTEL 80C51microcontroller;
- knowledge of programming the INTEL 80C51 microcontroller

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject				**Quality and Reliability**			
2.2 Holder of the subject				**Prof. PhD eng. Gabriela Tonţ**			
2.3 Holder of the academic laboratory/project				**Prof. PhD eng. Gabriela Tonţ**			
2.4 Year of study	**III**	2.5 Semester	**5**	2.6 Type of the evaluation	**Vp**	2.7 Subject regime	**DD**

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

3.1 Number of hours per week	**4**	of which: 3.2 course	**2**	3.3 academic laboratory	**2**
3.4 Total of hours from the curriculum	**56**	Of which: 3.5 course	**28**	3.6 academic laboratory	**28**

Distribution of time	hours
Study using the manual, course support, bibliography and handwritten notes	18
Supplementary documentation using the library, on field-related electronic platforms and in field-related places	6
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	14
Tutorials	2
Examinations	4
Other activities.	

3.7 Total of hours for individual study	**44**
3.9 Total of hours per semester	**100**
3.10 Number of credits	4

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses - The course can be held face to face or online
5.2.for the development of the academic laboratory/project	- Mandatory presence at all laboratories; - The laboratory/project can be carried out face to face or online - Students come with the observed laboratory works - A maximum of 2 works can be recovered during the semester (30%); - The frequency at laboratory hours below 70% leads to the restoration of the discipline

6. Specific skills acquired	
Professional skills	**C1.**Make calculations, demonstrations and applications in order to solve specific engineering and management tasks, based on knowledge achieved from fundamental sciences and engineering sciences. **C5.** Technical and technological design of processes belonging to electric, electronic and energy engineering systems, structures and industry, according to quality requirements.
Transversal skills	**TC1.**Responsibly apply the principles, norms and values of professional ethics in order to achieve the goals and identify the objectives, the available resources, the steps to be done and time spent for finishing the works, the deadlines, and the risks involved. **TC2.**Identify the roles and responsibilities of each member of a pluri-disciplinary team and apply efficient work and relational techniques inside the team.

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	• Creating cognitive and functional skills to address the issues of predictive reliability, operational and operational safety (availability, maintenance, maintainability, security).
7.2 Specific objectives	• • Development of skills related to the elaboration of logical reliability schemes (connection schemes) for complex technical systems; • • Development of skills related to the analysis of the state of operation or defect of complex technical systems depending on the state of the components; • • Quality estimation based on statistically processed data. • • Based on the evaluation of the cost / quality ratio, the student will have at his disposal a new decision criterion on the variants regarding the configuration and reliability of the functionally possible schemes for a specified product, process or service.

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
1. Approaching reliability in systems theory. 1.1. Global modeling of systems reliability. 1.2. Applicability of the general model of a system to reliability studies. 1.3. The stochastic dependence between the variables that define the model	Free exposure, with the presentation of the course with video projector, on the board or online	2 h
2. Reliability indicators 2.1. For a proper description of the evolution of systems, a rigorous mathematical definition of the phenomenon of wear is required. 2.2. System wear modeling (IFR, DFR, IFRA, DFRA, NBU, NWU, NBUE, NWUE systems)	Free exposure, with the presentation of the course with video projector, on the board or online	2 h
3. Wear-free systems. Barlow Test - Campo	Free exposure, with the presentation of the course with video projector, on the board or online	2 h

3. Choosing the distribution law associated with the defect mechanisms. The association between a distribution law.. Consistent tests (Kolmogarov - Smirnov, probability networks, Hi-squared) and Lilefors test for normality check	Free exposure, with the presentation of the course with video projector, on the board or online	2 h
3.5. Verification of the consistency between theoretical law and experimental data from the perspective of informational statistics Continuous approximation of the law of distribution. Distribution laws	Free exposure, with the presentation of the course with video projector, on the board or online	2 h
7.Quality The notion of quality. Definition and acceptances Quality characteristics Quality Components The quality loop. Quality spiral Quality management	Free exposure, with the presentation of the course with video projector, on the board or online	2 h
8. Quality system Main concepts The need to implement a quality system Situations in which the quality system is implemented ISO standards series 9000: 1994 on quality systems Selection of the quality system model Quality system documents	Free exposure, with the presentation of the course with video projector, on the board or online	2 h
9. Quality manual - MQ System function procedures - PFS Working procedures / instructions-P / I-L Quality plans - PC Audit plans - PA quality records - IC	Free exposure, with the presentation of the course with video projector, on the board or online	2 h
10 ISO 9000 series standards ISO 9000: 2006 standard Vocabulary Fundamental principles of quality management systems ISO 9001: 2006 standard Characteristic features	Free exposure, with the presentation of the course with video projector, on the board or online	2 h
11. Certification Terminology (according to EN 45000 series standards) Areas of certification Certification of products or services Implications of affixing the CE marking Products requiring CE marking	Free exposure, with the presentation of the course with video projector, on the board or online	2 h
12. Costs related to quality Non-quality costs Structure of costs related to quality, to the manufacturer The structure of costs related to quality, to the beneficiary		
13. Methods, techniques and tools of analysis and evaluation used to improve quality Quality index method Histogram method Pareto diagram Dementia method (penalty for defects)	Free exposure, with the presentation of the course with video projector, on the board or online	2 h

Direct comparative method		
14. TQM Terminology Total quality Management through total quality	Free exposure, with the presentation of the course with video projector, on the board or online	2 h

Bibliography

[1]. Panaite, V., Munteanu, R., Control statistic şi fiabilitate, Bucureşti, Ed. Didactică şi Pedagogică, 1982;
[2]. Cătuneanu V.M., Mihalache A., Bazele fiabilităţii, Bucureşti, Ed. Tehnică, 1983
[3]. Gabriela Tonţ Fiabilitatea sistemelor, Ed. Universităţii din Oradea, 2002;
[4]. Panaite, V, Popescu M., Calitatea produselor şi fiabilitate, Bucureşti, Matrix Rom, 2003;
[5]. Mihoc Gh., Muja A., Diatcu E., Bazele matematicii ale teoriei fiabilităţii, Cluj-Napoca, Ed. Dacia, 1976. Panaite, V., Munteanu, R., Control statistic şi fiabilitate, Bucureşti, Ed. Didactică şi Pedagogică, 1982.

8.2 Academic laboratory	Teaching methods	No. of hours/ Observations
L.1. Processing and interpretation of statistical data obtained from experiments L.2. Determination of the life of insulation systems used in the construction of electrical equipment; L.3. Determination of the reliability of complex electrical systems using the MARKOV chain method; L.4. Measurement control. Making the control sheet L.5. Attribute control. Making the control sheet L.6. Dimensional control using statistical calculation L.7. Ability analysis. Maintaining the accuracy of measuring and control equipment	Students receive laboratory papers at least one week in advance, study them, inspect them, and take a theoretical test at the beginning of the laboratory. Then, the students carry out the practical part of the work under the guidance of the teacher	4 h 4 h 4 h 4 h 4 h 4 h 4 h

Bibliography

[1]. Panaite, V, Popescu M., Calitatea produselor şi fiabilitate, Bucureşti, Matrix Rom, 2003;
[2]. Mihoc Gh., Muja A., Diatcu E., Bazele matematicii ale teoriei fiabilităţii, Cluj-Napoca, Ed. Dacia, 1976.
[3]. Gabriela Tonţ, D.G. Tonţ, Indrunator de fiabilitate, Ed. Universităţii din Oradea, 2016.

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline can be found in the curriculum of Economic engineering in the electrical, electronic and energy field and other university centers that have accredited these specializations (Technical University of Cluj-Napoca, University of Craiova, "Politehnica" University of Timisoara, Gh. Asachi University of Iasi, etc.) and knowledge of the types of electric drives and their operation and design is a stringent requirement of employers in the field (Comau, Faist Mekatronics, Celestica, GMAB, etc.).

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods The evaluation can be done face-to-face or online	10.3 Percent from the final mark
10.4 Course	Minimum required conditions for passing the exam (mark 5): in accordance with the minimum performance	**Written exam** Students receive for solving each a form with 3 subjects of theory and an application.	60 %

	standard it is necessary to know the fundamental notions required in the subjects, without presenting details on them For 10: thorough knowledge of all subjects is required		
10.5 Laboratory	Minimum required conditions for promotion (grade 6): identification of the elements of the system under consideration; establishing functional links between the system and its components; the operating block scheme – system downtime is drawn up. For 10: the implementation of the logical reliability scheme; verification of compliance with the initial conditions in the reliability scheme (connection scheme);	**Test + practical application** At each laboratory students receive a test and a grade. Each student also receives a grade for laboratory work during the semester and for the laboratory work file. This results in an average for the laboratory.	40%
10.6 Minimum performance standard: Course: After completing the discipline students will be able to: - to carry out the block scheme on the basis of the system configuration; - to compile and analyse a logical scheme of reliability; to use statistical indicators for the calculation of forecast reliability indicators for the achievement of different applications. Laboratory: the operating block scheme – system failure is drawn up, the implementation of the logical reliability scheme; verification of compliance with the initial conditions in the reliability scheme (connection scheme); knowledge for note 10 calculate the system reliability and maintenance indicators; The timely solution, in individual activities and group activities, in conditions of qualified assistance, of the problems that require the application of principles and rules respecting the norms of professional deontology. Responsible assumption of specific tasks in multi-specialized teams and efficient communication at institutional level. Elaboration and argumentative support of the application of a personal professional development plan.			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject				**BASICS OF PROJECT MANAGEMENT**			
2.2 Holder of the subject				**Assoc.prof. PhD eng.ec. Liliana Doina Măgdoiu**			
2.3 Holder of the academic seminar/laboratory/project				**Assoc.prof. PhD eng.ec. Liliana Doina Măgdoiu**			
2.4 Year of study	**IV**	2.5 Semester	**8**	2.6 Type of the evaluation	**Ex**	2.7 Subject regime	**SD**

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

3.1 Number of hours per week	**5**	of which: 3.2 course	**3**	3.3 academic seminar/laboratory/project	**2**
3.4 Total of hours from the curriculum	**70**	Of which: 3.5 course	**42**	3.6 academic seminar/laboratory/project	**28**
Distribution of time					59h
Study using the manual, course support, bibliography and handwritten notes					28
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					7
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					14
Tutorials					2
Examinations					4
Other activities.					

3.7 Total of hours for individual study	**55**
3.9 Total of hours per semester	**125**
3.10 Number of credits	**5**

4. Pre-requisites (where applicable)

4.1 related to the curriculum	
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- attending at least 50% of the course - the course can be held face to face or online
5.2.for the development of the academic seminary/laboratory/project	- mandatory presence at all project hours;

6. Specific skills acquired

Professional skills	C2.Elaboration and interpretation of technical, economic and managerial documentation C3.Planning, scheduling and management of enterprises, as well as associated logistics networks, as well as production monitoring C5.Technical and technological design of the processes regarding the structures and systems in the electrical, electronic and energetic field in quality conditions, technical and technological design of the processes in the electrical, electronic and energetic industry, in given quality conditions C6. Management and control of companies and processes specific to the study program: project and enterprise management in the electrical, electronic and energy field
Transversal skills	CT2. Identify roles and responsibilities in a multi-specialized team decision-making and assigning tasks, with the application of relationship techniques and efficient work within the team

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ Familiarizing students with problems related to project management
7.2 Specific objectives	Construction of the project proposal, Managerial evaluation of the project, Reporting project results, Writing the technical report, Establishment of intellectual property capital in scientific research activity, Case studies.

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
Chapter 1. Construction of the project proposal	Free exposure, with the presentation on-line	6h
Chapter 2. Managerial evaluation of the project	Free exposure, with the presentation on-line	6 h
Chapter 3. Reporting project results	Free exposure, with the presentation on-line	8 h
Chapter 4. Writing the technical report	Free exposure, with the presentation on-line	8 h
Chapter 5. Research results and intellectual property	Free exposure, with the presentation on-line	6 h
Chapter 6. Establishing the intellectual property capital in the scientific research activity.	Free exposure, with the presentation on-line	8 h
Total		42 h
Bibliography		

1.Laura Coroiu, Nicolina Maghiar, *Managementul proiectelor,* curs în format electronic, 2010;
2. Nicolina Maghiar, *Managementul proiectelor,* curs pentru uzul studentilor, 2011;
2.D. Isoc, *Managementul proiectelor de cercetare- Proiecte cu finanţare publică naţională şi internaţională. Capitalizarea şi gestiunea proprietăţii intelectuale. Ghid practic.* Editura Risoprint Cluj Napoca 2007;
3. Mariana Mocanu, Carmen Schuster, *Managementul proiectelor Ed a II-a,* Colecţia afaceri, Editura All Beck, Bucureşti, 2004;
4.O. Nicolescu, E. Burduş,… *Ghidul managerului eficient, Vol 1,* Editura Tehnică Bucureşti 1993;
5.J.L. Koorey, D.B. Medley, *Management Information Systems*, South-Western Publishing Co. Cincinnati,Ohio, 1986;
6.K.C.Laudon, J.Price Laudon, *Management Information Systems*, A Contemporary Perspective, Macmillan Publishing Company, 1988.

8.2 Academic seminar/laboratory/project	Teaching methods	No. of hours/ Observations
Case Study. The techniques and tools of the project manager in describing the activities of an implementation plan Elaboration of the project proposal Design of the technical component Writing the technical report Managerial evaluation of the project Reporting project results Supporting the project and concluding the situation.	Students receive homework for the seminar papers or choose their homework at least a week in advance, study, design the papers and present them at the seminar. Appreciations and comments are made under the guidance of the teacher.	4 h 4 h 4 h 4 h 4 h 4 h 4 h
Total:		28 h
Bibliography 1. Nicolina Maghiar, *Managementul proiectelor,* curs pentru uzul studentilor, 2011;; 2. Lonnie Pacelli, *Consilierul managerului de proiect*, Meteor Press 2007, ISBN 978-973-728-215-6		

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline is found in the curricula of other university centers that have accredited similar specializations. On the other hand, the problem of finding appropriate managerial concepts for solving problems in conditions of transformation and reform is a stringent requirement of today's changing society for both employees and employers.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	- for grade 5 it is necessary to know the fundamental notions required in the subjects, without presenting details on them - for grade 10, a thorough knowledge of all subjects is required	**Written exam** Students receive pre-arranged topics for solving(10p)	60%

10.5 Project	-for note 6, briefly going through the design stages -for grade 10, going through all the design stages, with the completion of the calculations	**Project evaluation** **Oral support** Following the presentation of the project completed during the semester, each student receives a grade.	40%
10.6 Minimum performance standard: Course: - Solving and explaining problems of medium complexity, associated with the discipline of project management. Project: - Elaboration of projects aimed at the management of the enterprise in the electrical field.			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	Department of Control Systems Engineering and Management
1.4 Field of study	Engineering and management
1.5 Study cycle	Bachelor
1.6 Study program/Qualification	Economic Engineering in Electric, Electronic and Energetic Field

2. Data related to the subject

2.1 Name of the subject	**Business Law**						
2.2 Holder of the subject	**Lect. PhD jr. Anca PĂCALĂ**						
2.3 Holder of the academic seminar/laboratory/project	**Lect. PhD jr. PĂCALĂ**						
2.4 Year of study	IV	2.5 Semester	7	2.6 Type of the evaluation	Continuous Assessment	2.7 Subject regime	DD

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

3.1 Number of hours per week	3	of which: 3.2 course	2	3.3 academic seminar/laboratory/project	1
3.4 Total of hours from the curriculum	42	Of which: 3.5 course	28	3.6 academic seminar/laboratory/project	14

Distribution of time	58h
Study using the manual, course support, bibliography and handwritten notes	28
Supplementary documentation using the library, on field-related electronic platforms and in field-related places	10
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	14
Tutorials	3
Examinations	3
Other activities.	

3.7 Total of hours for individual study	**58**
3.9 Total of hours per semester	**100**
3.10 Number of credits	4

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses - The course can be held face to face or online
5.2.for the development of the academic laboratory/project	- Mandatory presence at least 70% of the academic seminar; - The academic seminar can be held face to face or online - The frequency at academic seminar hours below 70% leads to the restoration of the discipline

6. Specific skills acquired
C2. Elaborate, interpret and analyze technical, economical and managerial documents. **C3.** Companies planning, programming and management, as well as associated logistic networks, and also, follow the production. **C5.** Project management and enterprise of electrical, electronic and energy marketing and economic agreements.
CT1. Responsibly apply the principles, norms and values of professional ethics in order to achieve the goals and identify the objectives, the available resources, the steps to be done and time spent for finishing the works, the deadlines and the risks involved. **CT2.** Identify the roles and responsibilities of each member of a pluri-disciplinary team and apply efficient work and relational techniques inside the team.

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	Familiarizing students with notions from unstudied fields, knowledge, understanding, explanation and interpretation of the main provisions contained in normative acts of major importance for any graduate of higher education and especially for those in the field of Engineering Sciences
7.2 Specific objectives	• The course presents the theories, the ideas regarding the theoretical bases of starting a business whose purpose remains to obtain profit. We aim, in particular, to form the discernment necessary for the objective appreciation and retention by students of the issue of business law. • The seminar acquaints the students with the terminology specific to the discipline, helping them to understand and interpret the provisions of the normative acts incident to the field of studies.

8. 8. Contents

8.1.Course	Teaching methods	No. of hours/ Observations
Introductory notions on business law. Definition. Object. Evolution.	Free exposure, with the presentation of the course with video projector, on the board or online	2h
Trade activity. The facts of trade. Business law topics. Acquisition and termination of the quality of trader	Free exposure, with the presentation of the course with video projector, on the board or online	2h
Commercial company - Definition, types of commercial companies. Establishment of companies: consensual stage, legal stage, advertising stage, registration and fiscal registration.	Free exposure, with the presentation of the course with video projector, on the board or online	4h
Management and control of the company's activity. Legal personality of the company. General Assembly. The administrators of the company. Dissolution and liquidation of the company: General causes of dissolution; Special causes of dissolution.	Free exposure, with the presentation of the course with video projector, on the board or online	6h
Notes of specificity of partnerships. Specificity notes of S.N.C. Specificity notes of S.C.S.	Free exposure, with the presentation of the course with video projector, on the board or online	2h

Specificity notes of capital companies. Specific notes of S.A. Specificity notes of S.C.A	Free exposure, with the presentation of the course with video projector, on the board or online	4h
General meeting of shareholders. Convening the general assembly. The limits of the power of the general meeting of shareholders. Management systems.	Free exposure, with the presentation of the course with video projector, on the board or online	4h
Specificity notes of SRL	Free exposure, with the presentation of the course with video projector, on the board or online	2h
Actions- definition, general characters, types. Obligations- definition, general characters, issuance procedure	Free exposure, with the presentation of the course with video projector, on the board or online	2h

Bibliography

1. Anca Păcală, Elemente de drept comercial. Ed Univ din Oradea, Oradea, 2002
2. S.D. CĂRPENARU – Trata de drept comercial, Ed. Universul juridic, Bucureşti, 2009
3. Alexandru ŢICLEA, Societăţile comerciale de la A la Z – Editura „Şansa", Bucureşti, 1990
4. Fr.DEAK, S.D. CĂRPENARU, Contracte civile şi comerciale, Bucureşti, 1994
5. Vasile PATULEA, Corneliu TURUIANU: Curs de drept comercial român, Editura ALL BECK, Bucureşti, 1999
6. Ion TURCU – Tratat de insolvenţă, Editura C.H. Beck, Bucureşti, 2006
7. Stanciu D. CĂRPENARU, Vasile NEMEŞ, ş.a. – Noua Lege a insolvenţei – Legea nr. 85/2004, comentarii pe articole, Editura Hamangiu, 2006, Bucureşti
8. Ioan ADAM, Condruţ Nicolae SAVU – Legea procedurii insolvenţei, Comentarii şi explicaţii, Editura C.H. Beck, Bucureşti, 2006
9. Codul civil roman
10. Legea 31/1990
11. Legea 85/2014

8.2 Academic seminar/laboratory/project	Teaching methods	No. of hours/ Observations
Introductory notions on business law. Definition. Object. Evolution. Trade activity. The facts of trade. Business law topics. Acquisition and termination of the quality of trader Definition, types of commercial companies. Establishment of companies. Legal personality of the company. The administrators of the company. Dissolution and liquidation of the company. Specificity notes of S.N.C. Specificity notes of S.C.S. Specific notes of S.A. Specificity notes of S.C.A The limits of the power of the general meeting of shareholders. Management systems. Specificity notes of SRL	Students receive academic seminar papers at least one week in advance, study them and take a theoretical test at the beginning of the academic seminar. Then, the students solves cases under the guidance of the teacher.	2 h 2 h 2 h 2 h 2 h 2 h 2 h

Bibliography

1 Legea 31/1990
2. Legea 85/2006
3. Codul civil roman
4. Anca Păcală, Elemente de drept comercial, Ed Universităţii din Oradea, Oradea, 2002

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline can be found in the curriculum of Economic Engineering in Electric, Electronic and Energetic Field and other university centers that have accredited these specializations (Technical University of Cluj-Napoca, "Politehnica" University of Timisoara, etc.) and knowledge of the types of law is a stringent requirement of employers in the field.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods The evaluation can be done face-to-face or online	10.3 Percent from the final mark
10.4 Course	Minimum required conditions for passing the exam (mark 5): in accordance with the minimum performance standard it is necessary to know the fundamental notions required in the subjects, without presenting details on them For 10: thorough knowledge of all subjects is required	**Oral examination** Students receive for solving each a form with 2 subjects of theory and an application.	60 %
10.5 Academic seminar	Minimum required conditions for promotion (grade 5): in accordance with the minimum performance standard recognition of the stands used to carry out the academic seminar works, without presenting details on them For 10: detailed knowledge of how to perform all academic seminar work.	**Test + practical application** At each academic seminar students receive a test and a grade. Each student also receives a grade for academic seminar work during the semester.	40%
10.6 Minimum performance standard: Course: - knowledge of the basic notions specific to business law; -ability to interpret the normative acts; Academic seminar: - ability to explain terms used in the field of law -ability to solve practical cases;			

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Control systems engineering**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic field/ Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject			**DIGITAL SYSTEMS**				
2.2 Holder of the subject			**Lect. PhD eng.** Kovendi Zoltan				
2.3 Holder of the academic laboratory/project			**Lect. PhD eng.** Kovendi Zoltan				
2.4 Year of study	IV	2.5 Semester	8	2.6 Type of the evaluation	VP	2.7 Subject regime	DD

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

3.1 3.1 Number of hours per week	2	of which:3.2course	2	3.3 seminar/laboratory/project	-/-/-
3.4 Total of hours from the curriculum	28	of which: 3.5 course	28	3.6 seminar/laboratory/project	-/-/-
Distribution of time					22 hours
Study using the manual, course support, bibliography and handwritten notes					8
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					2
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					6
Tutorials					2
Examinations					4
Other activities.....					
3.7 Total of hours for individual study	**22**				
3.9 Total of hours per semester	**50**				
3.10 Number of credits	**2**				

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditioners) electric machines, analog and digital electronics, electrical and electronic measurements
4.2 de related to skills	Use of conventional voltage sources and measuring devices, identification of connections in electrical control and power diagrams of motors

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses - The course can be held face to face or online
5.2.for the development of the academic laboratory/project	- Mandatory presence at all laboratories; - The laboratory/project can be carried out face to face or online - Students come with the observed laboratory works - A maximum of 2 works can be recovered during the semester (30%);

	- The frequency at laboratory hours below 70% leads to the restoration of the discipline

6. Specific skills acquired	
Professional skills	**C3.** Planning, scheduling and management of enterprises, as well as associated logistics networks, as well as production monitoring **C5.** The technical and technological design of the processes regarding the structures and systems in the electrical, electronic and energetic field in quality conditions, the technical and technological design of the processes in the electrical,electronic and energetic industry in given quality conditions
Transversal skills	

The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ Assimilation by the students of the notions necessary for the design and use of finite state machine. In this sense variants of their hardware and software realization will be presented. There is presented the general theory, the sequential cicrcuits that implement them, the realization of the management by states of an industrial process involving electric machines. It presents the way of realizing finite state machine through the program, in the graphic programming variant, as well as notions about the interface of a computer with data acquisition board. Laboratory works studies the programming and operating charctheristics of electric motor systems using the Labview graphics application development environment, PCI-MIO-16E-4 data acquisition boards and electroc motor assemblies.
7.2 Specific objectives	▪ Creating the ability tu use and design state machines ▪ Familiarization of students with methods of hardware realization of state machines in different variants ▪ Identyfing the possibilities offered by data acquisition boards in program management of processes involving electric machines and their correlation with the needs of given application ▪ Following the correctness of the realization of a sequential circuit that implements a state automatic through switch type stimulus and LED vizalization ▪ Use of programs that implement state machines for driving electrically operated systems.

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
Chapter 1. State machine : 1.1. General properties of sequential circuits (combinational circuit and sequential circuit; determination of equations for wiring diagram with logic gates; block-diagram models for synchronous and asynchronous sequential circuits)	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 1. State machine : 1.2. description of the behaviour of sequential circuit; the mathetimatical model of sequential circuit, reprezentation of Mealy type automata through state diagrams and tranzition tabel	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours

Chapter 1. State machine : 1.2. description of the behaviour of a sequential circuit; representation of Moore type machine by state diagrams and by transition table	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 1. State machine: 1.3 transforming the Moore model into the Mealy model and vica versa	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 2. Synthesis of sequential circuits 2.1. Synthesis of asynchronous sequential circuits	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 2. Synthesis of sequential circuits. 2.2. Synthesis of synchronous sequential circuits with flip-flops and logic gates	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 2. Synthesis of sequential circuits. 2.3. Synthesis of synchronous sequential circuits with decoders	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 2. Synthesis of sequential circuits. 2.4. Synthesis of synchronous sequential circuits with counters and multiplexors	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 2. Synthesis of sequential circuits. 2.5. Synthesis of synchronous sequential circuits with programmable fixed memories	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 3. State machine implementation through program . 3.1 Introducing the LABVIEW graphical application development environment	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 3. State machine implementation through program: 3.2. Command and function pallets. Data terminals and commands of indicators. Nodes and structures on the block diagram usable for state machines	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours
Chapter 3. State machine implementation through program 3.3. Software development method	Free exposure,with the presentation of the course with video projector, on the board or online	2 ore
Chapter 3. State machine implementation through program. 3.4. Virtual instrument design techniques	Free exposure,with the presentation of the course with video	2 hours

	projector, on the board or online	
Chapter 3. State machine implementation through program. 3.4. Virtual instrument design techniques – continuation : state machine techinque	Free exposure,with the presentation of the course with video projector, on the board or online	2 hours

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6. 1. Toma Hentea, Automatizări industriale discrete, curs litografiat, IPTV Timişoara, 1981
7. 2. Pop Vasile, Analiza şi sinteza dispozitivelor logice, curs litografiat, Vol i,II, Facultatea de Electotehnică, IPTV Timişoara, 1986
8. 3. Muntean I., Sinteza automatelor finite, ET, Bucureşti, 1997
9. 4. Gavriş M., Analiza şi sinteza sistemelor numerice, curs litografiat, Universitatea Oradea, 1998Gergely E., ş.a., Sisteme cu microprocesoare, partea I, Curs, Lito Universitatea din Oradea, 1999.
10. Manualele de utilizare ale LabVIEW 8.5.1
11. D.Tonţ, Sisteme digitale, notiţe de curs, 2012
12. D. Tonţ, Sisteme de achiziţie şi prelucrare a datelor , ISBN 973-613-070-3, Univ. Oradea, p.222, 2002.

8.2 Seminar/laboratory	Teaching methods	Nr. Of hours / Observations

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline is in accordance with other university centers from the country and abroad. For a better adaptation to the requirements of the field of work, meetings were held both with representatives of the socio-economic environment and with professors with similar fields of interest.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	- - Minimum requirements for passing the exam**(note 5)**: In accordance with the minimum performance standard **- For 10 grade:** - thorough knowledge of the theory of state machine - thorough knowledge of the design of electrical diagrams for hardware of state machines; - thorough knowledge of creating virtual tools in LabVIEW graphical application - thorough knowledge of state-of-the-art technology in LabVIEW - thorough knowledge of input-output operations	The evaluation can be done face-to-face or online	100,00%

10.8 Minimum performance standard:

Course:

- knowledge about state machines;
- knowledge regarding the realization of electrical diagrams for hardware implementation
- knowledge of LabVIEW environment (virtual tools, their components, available palettes)
- knowledge of While,For,Case structures in Labview

Laboratory :

- knowledge regarding the realization of a virtual instrument without structures(loops)
- knowledge of the use of test panels for data acquisition boards

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Datarelated to thesubject

2.1 Name of the subject		**Organizational behavior**					
2.2 Holder of the subject		**LecturerRica Ivan, PhD Econ.**					
2.3 Holder of the academic laboratory/project		**Lecturer Rica Ivan, PhD Econ.**					
2.4 Year of study	**IV**	2.5 Semester	**7**	2.6 Type of the evaluation	**Midterm**	2.7 Subject regime	**Field subject**

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

3.1 Number of hours per week	**4**	of which: 3.2 course	**2**	3.3 academic laboratory/project	**2**
3.4 Total of hours in the curriculum	**56**	of which: 3.5 course	**28**	3.6 academiclaboratory/project	**28**

Distribution of time	56 hours
Study using the manual, course handbook/guide, bibliography and handwritten notes	28
Supplementary documentation work using the library, on field-related electronic platforms and in field-related places	8
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	14
Tutorials	2
Examinations	4
Other activities.	

3.7 Total of hours for individual study	**56**
3.9 Total of hours per semester	**100**
3.10 Number of credits	**4**

4. Pre-requisites(where applicable)

4.1 related to the curriculum	Student should be familiar with management, marketing, mathematical statistics and probabilities subjects
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses; - The course can be held face to face or online.
5.2.for the development of the academic laboratory/project	- Mandatory presence at all laboratories/seminars; - A maximum of two (2)laboratory works can be recovered during the semester (30%);

	- A seminar/laboratory attendance below 70% means the student has to resume the entire course - The seminar/laboratory/projectcan be held face to face or online.

6. Specific skills acquired	
Professional skills	• Planning, scheduling and management of enterprises, as well as associated logistics networks, as well as production monitoring; • Elaboration and interpretation of technical, economic and managerial documentation; • Elaboration and evaluation of technical, economic and financial flows of a business, management of technical, economic and financial related phenomena
Transversal skills	• Responsible integration within a working team, with the ownership of clear tasks that involve teamwork. • Assigning roles and responsibilities in a multidisciplinary team and application of effective relationship and work techniques within the team.

7. The objectives of the discipline(as resulting from the grid of the specific skills acquired)

7.1 The general objective of the subject	• Learning the subject specific concepts in a normative, descriptive and applicative context, and understanding the basic mechanisms of the functioning of the organizations, and the role thereof within the society.
7.2 Specific objectives	• Operating with the relevant theories, concepts and models of organizational behavior domain and using the acquired knowledge in a critical manner; • Finding the behavioral frameworks according to which the human resources processes and activities are designed and conducted; • Finding and analyzing leadership styles in real organizational situations; • Finding and operating with those behaviors that prove the psychological adequacy between the employee and the post; • Knowledge and understanding of behavior optimization mechanisms; • Finding the levels of manifestation of behavior within organizations; • Using the main paradigms and theories in organizational diagnoses.

8. Contents

8.1 Course	Teaching methods	No. of hours/ Observations
1. Basic concepts of organizational behavior (organizational society, organizational man)	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
2. Formal and informal structures in an organization: individual, group, department, organization. 2.1. Group or team in the organization	Free exposure, with the presentation of the course through the video projector and on the board	**2h**

3. Forms and structures of an organization. 3.1. Functional, divisional and matrix type organization	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
4. Institutional structures and networks. The formal and informal side of an organization 4.1. Applications in the field of organizational development.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
5. Leadership styles. 5.1. Autocratic 5.2. Democratic 5.3. Free-reign*(Laissez-faire)*	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
6. Motivation in the organization. 6.1. Applications in the field of organizational development	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
7. Organizational culture. Models and typologies in the culture of an organization. 7.1. Applications in the field of organizational development.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
8. Attitudes and behavior: the structure of attitudes. 8.1. Attitude functions, attitude change.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
9. Organizational behavior in modern approaches to organization.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
10. Defining elements of socio-technical-economic organizations. 10.1 Functional typologies.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
11. The relationship between the individual and the socio-technical-economic organization. 11.1. Integration relations. 11.2. Collaborative relations.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
12. Socio-technical-economic organizations - characteristics. 12.1. Organizational behavior in socio-technical-economic systems	Free exposure, with the presentation of the course through the video projector and on the board	**2h**

13. The model of the social individual, the model of the self-actualized individual, the model of the complex individual.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**
14. Organizational behavior in modern approaches to organization.	Free exposure, with the presentation of the course through the video projector and on the board	**2h**

Bibliography

[1] Gabriela Tonţ − *Fiabilitatea sistemelor*, Oradea University Press, ISBN 973-9453-54-3, 215 pg., 2002;
[2] Gabriela Tonţ − *Calitatea în electrotehnică*, ISBN 973- 613-544-6, Oradea University Press, 151 pg., 2004.
[3] Gabriela Tonţ, D.G. Tonţ − *Calitatea în electrotehnică*, laboratory, Oradea University Press, 90 pg., 2004.
[4] Păunescu,M., *Organizare şi câmpuri organizaţionale*, PoliromPublishingHouse, Iaşi, 2006;
[5] Preda, M., *Comportament organizaţional. Teorii, exerciţiişi studii de caz*, Polirom PublishingHouse, Iaşi, 2006;
[6] Vlăsceanu, M., *Organizaţiişi comportament organizaţional*, Polirom PublishingHouse, Iaşi, 2003.

8.2 Academic laboratory/seminar	Teaching methods	No. of hours/ Observations
1. Introduction to the world of organizations: brainstorming, workshop.	Students receive the bibliography for the preparation of seminar works at least one week in advance in order to study it and take notes. Students solve specific problems under the guidance and supervision of the professor/lecturer.	**4h**
2. Organizational stakeholders: individual, group, department, organization: debate, workshop.		**4h**
3. Forms and structures: functional, divisional and matrix type organization: text analysis, SWOT.		**4h**
4. The formal and informal side of the organization - role play.		**4h**
5. Leadership and motivation styles - autocratic, democratic, free-reign*(Laissez-faire)* (exercise), test (XY).		**4h**
6. Organizational culture: analysis of the Handy test.		**4h**
7. Organizational communication: communication exercises. Completion of students' academic records at seminar.		**4h**
		28h

Bibliography

9. Gabriela Tonţ − *Fiabilitatea sistemelor*, Oradea University Press, ISBN 973-9453-54-3, 215 pg., 2002;
10. Gabriela Tonţ, D.G. Tonţ − *Calitatea în electrotehnică*, ISBN 973- 613-544-6, Oradea University Press, 151pg., 2004.
11. Gabriela Tonţ, D.G. Tonţ − *Calitatea în electrotehnică*, laboratory, Oradea University Press, 90 pg., 2004.
12. Păunescu,M., *Organizare şi câmpuri organizaţionale*, PoliromPublishingHouse, Iaşi, 2006.

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the study program

- The content of the academic discipline can be found in the curriculum of the Economic Engineering in electronic, engineering and energy fields of specialization in other university centers that accredited these specializations.(Technical University of Cluj-Napoca, "Politehnica"University of Timisoara, etc.), and knowledge of marketing applied in engineering is a stringent requirement of employers in this field (Celestica, FaistMekatronics, Comau, GMAB,

etc.).

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark/grade
10.4 Course	-In order for a student to obtain the pass mark (5)s/he is required to know the fundamental notions required in the study subjects, without presenting them in detail. -In order for the student to obtain the maximum mark (10)s/he is required to make the proof of a thorough knowledge of all study subjects.	**Midterm evaluation** Students sit infour knowledge assessment tests during the semester containing questions and practical applications (with a maximum total score of 10 points) in the weeks 4, 8, 12, 14 of the seminar. The evaluation can be heldface to face or online	70 %
10.6 Seminar	- In order for a student to obtain the pass mark (5)s/he is required to solve all the problems submitted at seminar, without presenting them in detail; -In order for the student to obtain the maximum mark (10) s/he is required to solve all the problems submitted at seminar, with a detail presentation.	**Practical application** Students sit in a test and are given a grade during each seminar. Each student also is granted a grade for his/her activity at seminar throughout the semester. It results an average mark for the seminar. The evaluation can be held face to face or online.	30%

10.7 Minimum performance standard:

Course:

- Correct definition of the basic concepts of each topic, recognition of the main theories and paradigms and the main research methods.
- Student should get familiar with the various approaches, paradigms and relevant theories in dealing with any topic of the academic subject. Student should be able to analyze, compare and interpret the different central concepts of the academic subject.
- Student should be able to analyze, compare and interpret texts of some relevant authors in the field of study.

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject			**Product Life Cycle Management**				
2.2 Holder of the subject			**Lect.. PhD eng. Marius Romocea**				
2.3 Holder of the academic laboratory/project			**Lect. PhD eng. Marius Romocea**				
2.4 Year of study	**IV**	2.5 Semester	**8**	2.6 Type of the evaluation	**Ex**	2.7 Subject regime	**SD**

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

3.1 Number of hours per week	**4**	of which: 3.2 course	**2**	3.3 academic laboratory/project	**2**
3.4 Total of hours from the curriculum	**56**	Of which: 3.5 course	**28**	3.6 academic laboratory/project	**28**

Distribution of time	hours
Study using the manual, course support, bibliography and handwritten notes	44
Supplementary documentation using the library, on field-related electronic platforms and in field-related places	20
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	14
Tutorials	2
Examinations	4
Other activities.	

3.7 Total of hours for individual study	**44**
3.9 Total of hours per semester	**100**
3.10 Number of credits	**4**

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Attendance at least 50% of the courses - The course can be held face to face or online
5.2.for the development of	- Mandatory presence at all laboratories;

the academic laboratory/project	- The laboratory/project can be carried out face to face or online - Students come with the observed laboratory works - A maximum of 4 works can be recovered during the semester (30%); - The frequency at laboratory hours below 70% leads to the restoration of the discipline

6. Specific skills acquired	
Professional skills	Planning, scheduling and management of enterprises, as well as associated logistics networks, as well as production monitoring Leadership and control of companies and processes specific to the study program: project and enterprise management in the electrical, electronic and energy field
Transversal skills	identification of continuous training opportunities and efficient use, for one's own development, of information sources and of communication resources and assisted professional training (Internet portals, specialized software applications, databases, online courses, etc.) both in Romanian, as well as in a language of international circulation

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	The discipline aims to achieve an understanding of both the structured framework for the management of innovation and technical creation and the methods of design and systematic development that form this framework. The discipline also seeks to provide the means for a deep understanding of the whole process of developing a new product, as it should take place within a modern company producing goods.
7.2 Specific objectives	The theme of the course was oriented towards acquiring the necessary knowledge to approach the processes of technical creation as well as the most important stages of the development of new products to be manufactured in large series, engineering design problems without neglecting the company's strategy or management of activities that form the chain. development of a new productDuring the seminar, the aim was to acquire the theoretical concepts and to transfer in the applicative plan the theoretical knowledge acquired during the course.

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
Chapter I. The product design process. 1.1. Stages of the design process.1.2. Product life cycle.1.3. Basic rules for systematic design	Free exposure, with the presentation of the course with video projector, on the board or online	2h
Head. II. Company strategy. 2.1. Key measures for product development efficiency. 2.2. Product development strategies 2.3. Company planning. 2.4. Implementing the product development strategy. 2.5. Toolkit for analyzing the company's situation	Free exposure, with the presentation of the course with video projector, on the board or online	2h
	Free exposure,	

Chapter III. Identifying consumer needs. 3.1. Types of consumer needs . 3.2. Collection and processing of data on consumer needs	with the presentation of the course with video projector, on the board or online	2h
Head. IV. Product planning - Specifying the opportunity. 4.1. Product planning process. 4.2. Studying and analyzing opportunities. 4.3. Product triggers. 4.4. Analysis of competing products. 4.5. Study of market needs. 4.6. Choosing a product opportunity	Free exposure, with the presentation of the course with video projector, on the board or online	2h
Head. V. Principles of new product development. 5.1. The success and failure of new products 5.2.Risk management. 5.3. Quality targets. 5.4. Key concepts of new product development .	Free exposure, with the presentation of the course with video projector, on the board or online	2h
CH.VI. Creativity - the heart of the design process. 6.1. The mechanisms and importance of creativity. 6.2. Idea generation procedures. 6.3. Key concepts of creative thinking. 6.4. evaluation	Free exposure, with the presentation of the course with video projector, on the board or online	2h
Head. VII.. Design specification. 7.1. Establishing the target specification.7.2. Fixing the final specification.	Free exposure, with the presentation of the course with video projector, on the board or online	2h
Chapter VIII. Functional product modeling. 8.1. The basics of functional modeling.8.2. Establishing the functionality of the system	Free exposure, with the presentation of the course with video projector, on the board or online	2h
Head. IX. Conceptual design.9.1. Product load analysis. 9.2. Analysis of product functions. 9.3. Life cycle analysis. 9.4. The practice of generating concepts. 9.5. The concept of the classification tree.	Free exposure, with the presentation of the course with video projector, on the board or online	2h
Head. X. Selecting the concept. 10.1. Concept selection.10.2. The benefits of structured concept selection methods. 10.3. Presentation of the methodology	Free exposure, with the presentation of the course with video projector, on the board or online	2h

Head. XI. Product architecture. 11.1. Types of architectures. 11.2. Types of modularity. 11.3. Modular design	Free exposure, with the presentation of the course with video projector, on the board or online	2h
Head. XII. Product styling.12.1. The problem of visual simplicity.12.2. Determinants of style. 12.3. The attractiveness and style of the product.12.4. Product semantics.12.5. The symbolism of products.12.6. Style planning	Free exposure, with the presentation of the course with video projector, on the board or online	2h
Head. XIII. Concept testing.13.1. Defining objectives in testing the concept. 13.2. Description of the concept. 13.3. Interpretation and analysis of results	Free exposure, with the presentation of the course with video projector, on the board or online	2h
Head. XIV. Incorporation design, detailing and prototyping.14.1. Embedded design steps. 14.2. Incorporation testing. 14.3. Principles for prototype development. 14.4. Analysis of failure modes and effects	Free exposure, with the presentation of the course with video projector, on the board or online	2h

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2. Munteanu, R. - *Introducere în Ingineria Calității, Editura Mediamira, Cluj Napoca,2002*
3. Popescu D.M. - *Principiile formării în product design*,, Editura Utpress, Cluj Napoca, 2007
4. Wright M. – *Evoluția tehnologiei,* Editura Aquila Oradea,1993
5. M.Romocea - *Managementul ciclului de viata al produsului, notiţe de curs,* 2014

8.2 Academic laboratory	Teaching methods	No. of hours/ Observations
1.The stages of the product design process. Case Study 2.Product development strategies. Case Study. 3.Identifying consumer needs. Case Study 4.Product planning. Case Study 5.Creativity - the heart of the design process. Case Study 6.Conceptual design. Case Study 7.Incorporation design, detailing and prototyping. Case Study	During the laboratory classes, the aim was to acquire the theoretical concepts and to transfer in the applicative plan the theoretical knowledge acquired during the	4h 4h 4h 4h 4h 4h 4h

	course.	
8.3 Academic project	Teaching methods	No. of hours/ Observations
Bibliography Ioan Blebea, Corina Dobocan – Proiectarea produselor de la teorie la practică. Editura Utpress,Cluj Napoca,2007		

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

The content of the discipline is found in the curriculum of Engineering and Management and other university centers that have accredited these specializations ("Politehnica" University of Timisoara, Polytechnic University of Bucharest, etc.), and deep understanding of the entire process of developing a new product, is a stringent requirement of employers in the field (Plexus, Celestica, etc.)

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods The evaluation can be done face-to-face or online	10.3 Percent from the final mark
10.4 Course	Minimum required conditions for passing the exam (mark 5): in accordance with the minimum performance standard it is necessary to know the fundamental notions required in the subjects, without presenting details on them For 10: thorough knowledge of all subjects is required	**Written exam** Students receive for solving each a form with 3 subjects of theory and an application.	70%
10.5 Laboratory	Minimum required conditions for promotion (grade 5): in accordance with the minimum performance standard recognition of the stands used to carry out the laboratory works, without presenting details on them For 10: detailed knowledge of how to perform all laboratory work	**Test + practical application** At each laboratory students receive a test and a grade. Each student also receives a grade for laboratory work during the semester and for the laboratory work file. This results in an average for the laboratory.	30%
10.6 Project			
10.6 Minimum performance standard:			

Course

1.Learning the basic concepts of the product design process.
2.Developing technical creativity in the service of economic progress.
3.Understanding the importance of company management after a long-term strategy.
4.Understanding the importance of the interdependence between the product, its components and marketing.
5.Knowing the types of consumer needs.
6.Knowledge of the steps to follow in the product planning process.
7.Learning the key concepts of new product development.
8.Understanding the factors that can ensure the success of new products on the market.
9.Knowing the relationship of consumer needs with the design specification.
10. Understanding the need for functional modeling in the creative process.
11.Understanding the role of conceptual design in the development of a new product.
12.Understanding the importance of the stage of selecting concepts in the process of developing a new product

Laboratory:

1.Knowledge of the stages of the design process and the informational links between them
2.Implementing the product development strategy
3.Collection and processing of data on consumer needs
14Knowledge of idea generation procedures
4..Understanding the importance of setting the right goals in product development

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technolog**
1.3 Department	Control Systems Engineering and Management
1.4 Field of study	Engineering and management
1.5 Study cycle	Bachelor (1st cycle)
1.6 Study program/Qualification	Economic Engineering in Electric, Electronic and Energetic Fiel Bachelor of Engineering

2. Data related to the subject

2.1 Name of the subject				**QUALITY MANAGEMENT**			
2.2 Holder of the subject				**Assoc.prof. PhD eng.ec. Liliana Doina Măgdoiu**			
2.3 Holder of the academic seminar/laboratory/project				**Assoc.prof. PhD eng.ec. Liliana Doina Măgdoiu**			
2.4 Year of study	**IV**	2.5 Semester	**7**	2.6 Type of the evaluation	**Ex**	2.7 Subject regime	

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

3.1 Number of hours per week	**4**	of which: 3.2 course	**2**	3.3 academic seminar/laboratory/project	**2**
3.4 Total of hours from the curriculum	**56**	Of which: 3.5 course	**28**	3.6 academic seminar/laboratory/project	**28**
Distribution of time					69h
Study using the manual, course support, bibliography and handwritten notes					28
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					12
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					23
Tutorials					2
Examinations					4
Other activities.					
3.7 Total of hours for individual study	**44**				
3.9 Total of hours per semester	**100**				
3.10 Number of credits	**4**				

4. Pre-requisites (where applicable)

4.1 related to the curriculum	Knowledge of the courses: General Management, Managerial Communication
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- attending at least 50% of the course - the course can be held face to face or online
5.2.for the development of the academic seminary/laboratory/project	- mandatory presence at all seminar hours; - students come with observed seminar papers - a maximum of 3 seminars can be recovered during the semester (30% - attendance at seminar hours below 70% leads to the restoration of the discipline
6. Specific skills acquired	

Professional skills	**C1.** Make calculations, demonstrations and applications in order to solve specific engineering and management tasks, based on knowledge achieved from fundamental sciences and engineering sciences **C3.** Companies planning, programming and management, as well as associated logistic networks, and also, follow the production **C4.**Elaboration and evaluation of technical, economic and financial flows at business level, management of technical, economic and financial phenomenon
Transversal skills	**TC2**.Identifying the roles and responsibilities in a multidisciplinary team and applying effective relationship and work techniques within the team

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ Familiarizing students with theories on quality management
7.2 Specific objectives	▪ The course aims to form the discernment necessary for the objective assessme and retention by students of the issue of quality management ▪ The seminar familiarizes students with practical aspects of quality manageme at business level

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
Chapter 1. Concepts	Free exposure, with the presentation on-line	2 h
Chapter 2. Personalities and standards	Free exposure, with the presentation on-line	2 h
Chapter 3. Principles, methods and tools	Free exposure, with the presentation on-line	2 h
Chapter 4. Approaching management structures	Free exposure, with the presentation on-line	2 h
Chapter 5. Customer satisfaction	Free exposure, with the presentation on-line	2 h
Chapter 6. The role of employees	Free exposure, with the presentation on-line	2 h
Chapter 7. Continuous improvement	Free exposure, with the presentation on-line	2 h

Chapter 8. Relationships with suppliers	Free exposure, with the presentation on-line	2 h
Chapter 9. Quality management systems	Free exposure, with the presentation on-line	2 h
Chapter 10. Quality management systems	Free exposure, with the presentation on-line	2 h
Chapter 11. Application of quality standards	Free exposure, with the presentation on-line	2 h
Chapter 12. Product realization and warranty	Free exposure, with the presentation on-line	2 h
Chapter 13. Efficient maintenance	Free exposure, with the presentation on-line	2 h
Chapter 14. Audit	Free exposure, with the presentation on-line	2 h
Total		28 h

Bibliography

1. Rada, Ioan Constantin, **Economie**, Ed. Anotimp, 2002

2. Rada, Ioan Constantin; Rada, Ioana Carmen, **Economie. Caiet de lucrări**, Ed. Anotimp & Adsumus, 2002

3. Rada, Ioan Constantin; Bodog, Simona;Rada, Ioana Carmen; Lăzurean, Elena Nicoleta, **Economie generală, Marketing industrial (note de curs)**, Ed. Universităţii Oradea, 2006

4. Rada, Ioan Constantin; Bodog, Simona;Rada, Ioana Carmen; Lăzurean, Elena Nicoleta, **Economie generală, Marketing industrial (aplicaţii pentru seminar)**, Ed. Universităţii Oradea, 2006

5. Rada**,** Ioan Constantin, **Economie generală I**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2009,CD-ROM

6. Rada**,** Ioan Constantin, **Economie generală II**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2009,CD-ROM

7. Rada, Ioan Constantin, **Microeconomie. Idei moderne. Vol. I**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2007

8. Rada, Ioan Constantin, **Microeconomie. Idei moderne. Vol. II**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2008

9. Rada, Ioan Constantin; Rica, Ivan; Măgdoiu**,** Liliana Doina, **Finanţe şi credit (note de curs)**, Editura Universităţii din Oradea, 2011, CD-ROM

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11. Nagy, Ştefan; Rada, Ioan Constantin, **Sisteme avansate de producţie (note de curs)**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2008, CD-ROM

12. Nagy, Ştefan; Rada,Ioan Constantin, **Sisteme avansate de producţie (aplicaţii)**, Editura Asociaţiei „Societatea Inginerilor de Petrol şi Gaze", Bucureşti, 2008, CD-ROM

8.2 Academic seminar/laboratory/project	Teaching methods	No. of hours/ Observations
1. Report: ISO 9001: 2008, Quality management systems.	Students receive	2 h

requirement 2. Report: ISO 9004: 2000, Quality management systems. Guidelines for improving performance 3. Report: ISO 19011: 2002, Guidelines for auditing quality management systems and management environment 4. Report: Customer orientation 5. Paper: Fundamental principles of systems quality management 6. Report: Complete identification of system processes quality management. Making the process map 7. Report: Customer satisfaction 8. Report: Internal audit 9. Report: Corrective action 10.Report: Preventive action 11. Report: Non-compliant product control 12. Paper: Document control 13. Report: Control of records 14. Paper: Continuous improvement of the efficiency of the system quality management	homework for the seminar papers or choose their homework at least a week in advance, study, design the papers and present them at the seminar. Appreciations and comments are made under the guidance of the teacher.	2 h 2 h 2 h 2 h 2 h 2 h 2 h 2 h 2 h 2 h 2 h 2 h 2 h 2 h
Total		28 h
Bibliography It is the one indicated for the course		

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the discipline is found in the curriculum of Economic engineering specialization in electrical, electronic and energy field from other university centers that have accredited these specializations ("Politehnica" University of Timisoara, Technical University of Cluj-Napoca, Gh. Asachi Iasi, etc.), and knowledge the main types of processes and economic phenomena at microeconomic level, the theoretical elements of microeconomics and practical aspects regarding the economic-financial flows at business level, the management of economic and financial phenomenon is a stringent requirement of any employer in the field (Faist Mekatronics, Celestica, Comau, GMAB etc).

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from t final mark
10.4 Course	- for grade 5 it is necessary to know the fundamental notions required in the subjects, without presenting details on them - for grade 10, a thorough knowledge of all subjects is required	Written exam Students receive pre-arranged topics for solving	70%
10.5 Seminar	- for note 5, it is necessary to know the structure of the paper and one or two notions from the paper - for grade 10, the detailed knowledge of the issue and its support during the seminar	At each seminar, the students prepare a report, which can be collective, which they support and which is submitted to the debates during the seminars. Each student also receives a grade for the	30%

		seminar activity during the semester	

10.6 Minimum performance standard:

Course: - Elaboration of a professional project specific to the field of Engineering and Management using specific software systems and databases,

- Designing economic-financial processes at business level, for a given situation
- Elaboration of projects aimed at quality management in the electrical, electronic and energy fields,
- Participation in at least half of the courses.

Seminar: - Responsible realization, in conditions of qualified assistance, of projects for solving some problems specific to the field, with the correct assessment of the workload, of the available resources, of the necessary completion time and of the risks, in conditions of application of the deontological norms and of professional ethics in the field, as well as of safety and health at work.

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	DEPARTMENT OF ELECTRICAL ENGINEERING
1.4 Field of study	ELECTRICAL ENGINEERING
1.5 Study cycle	Bachelor (1st cycle)
1.6 Study program/Qualification	Economic engineering on electrical, electronic and energy/ Bachelor of Engineering

2. Data related to the subject

2.1 Name of the subject			**TECHNOLOGICAL METHODS AND PROCESSES**				
2.2 Holder of the subject			**Conf.dr.ing. BANDICI LIVIA**				
2.3 Holder of the academic seminar / laboratory / project			**Şef.lucr.dr.ing. GAL TEOFIL - Laboratory**				
2.4 Year of study	I	2.5 Semester	1	2.6 Type of the evaluation	VP	2.7 Subject regime	DD

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

3.1 Number of hours per week	42	of which: 3.2 course	2	3.3 academic seminar/laboratory/project	1
3.4 Total of hours from the curriculum	42	Of which: 3.5 course	2	3.6 academic seminar/laboratory/project	1

Distribution of time	hours
Study using the manual, course support, bibliography and handwritten notes	10
Supplementary documentation using the library, on field-related electronic platforms and in field-related places	10
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	7
Tutorials	3
Examinations	3
Other activities.	-

3.7 Total of hours for individual study	**33**
3.9 Total of hours per semester	**75**
3.10 Number of credits	3

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	Video projector, computer; - The course can be held face to face or online; - Attendance: at least 50% of the courses.
5.2.for the development of the academic seminary/laboratory/project	- The laboratory can be held face to face or online; - The equipment related to the laboratory class; - Preparation of the report (synthesis material);

	- Carrying out all laboratory works; - The recovery of one missed laboratory is allowed; - Attendance at laboratory classes: less than 70% leads to the restoration of the discipline.
6. Specific skills acquired	
Professional skills	**C4. Using measurement techniques for electrical and non-electrical quantities and data acquisition systems in electromechanical systems** **C5. Automation of electromechanical processes** **C6. Operating, maintenance, service, system integration activities**

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ Students acquire the concepts regarding technological methods and procedures, methods of analysis and synthesis of their structure; ▪ Applying general and specialized technical knowledge to solve the logistic problems specific to the field of electrical engineering
7.2 Specific objectives	▪ Design and use of schemes, structural and functional diagrams, graphic representations and technical documents specific to the field of electrical engineering

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
1. Basic concepts of technological methods and processes 1.1. Production process 1.2. Technological process	Projector. Intercalated student contributions are requested on subject-specific topics. Some courses take place by teaching subjects and student debates.	2
1.3. Technological flow 1.4. Quality technical control 1.5. Choosing the optimal process version 1.6. Elements of technical norming in the technological process	Idem	2
1.7. Precision of part and product processing. Tolerances and adjustments 1.8. Dimensions, deviations and tolerances	Idem	2
2. Material properties 2.1. Properties of materials and tests 2.2. Physical properties 2.3. Electrical properties 2.4. Magnetic properties 2.5. Mechanical properties and tests	Idem	2
2.6. Chemical properties 2.7. Electrical properties of insulating materials 2.8. Physical-chemical properties of insulating materials 2.9. Aluminium properties 2.10. Copper properties	Idem	2
3. Materials used in industry 3.1. Materials used in machine building 3.2. Metals and alloys used in electrical engineering 3.3. Electrical insulating materials used in electrical engineering 3.3.1. Gaseous electro-insulating materials 3.3.2. Liquid electro-insulating materials	Idem	2
3.3.3. Solid organic insulating materials 3.3.4. Solid inorganic insulating materials	Idem	2
4. Methods and processes of cold machining	Idem	2

4.1. Methods and processes for splitting machining 4.1.1. Turning 4.1.2. Milling 4.1.3. Drilling		
4.1.4. Planning 4.1.5.Polishing 4.1.6.Rectification 4.1.7. Other processing methods 4.2. Methods and processes for processing materials by cutting and cold plastic deformation 4.2.1. Cutting 4.2.2. Shaping 4.2.3. Continuous deformation	Idem	2
4.2.4. Bending 4.2.5. Drawing 4.2.6. Special processing of sheets 4.3. Unconventional technologies 4.3.1. Electrical discharge machining processing	Idem	2
5. Innovative technologies in material processing 5.1. Plasma cutting technology 5.2 Friction rotation with rotating element 5.3. 2D and 3D Laser Testing 5.4. Non-destructive processing of materials 5.5. Laser processing by shock 5.6. Innovative pressing processing 5.7. Method of heating ingots using superconducting magnets	Idem	2
5.8. Nanotechnology 5.9. Water jet cutting 5.10. Pipe welding technology in a hyperbaric environment 5.11. Bionanotechnology 5.12. Technology of material processing by solidification with phase change surface control 5.13. Graphene	Idem	2
6. Corrosion and corrosion protection of metals and alloys 6.1 Corrosion of metals 6.1.2. Chemical corrosion 6.1.3. Electrochemical corrosion	Idem	2
6.2. Corrosion protection of metals and alloys	Idem	2
Bibliography 1) Șt. Nagy, **Livia Bandici** - „*Metode și procedee tehnologice*", Editura Universităţii din Oradea, 2017, ISBN 978-606-10-1888-8. 2) V. Petre - "*Tehnologie Electromecanica – Îndrumar de laborator*", UPB, 2001. 3) F. Anghel, M.O. Popescu - "*Tehnologii Electromecanice*", UPB, 2001. 4) F. Anghel, I. Bestea - "*Tehnologii Electromecanice – Aplicaţii practice*", UPB, 2003. 5) T. Tudorache – "M*etode si procedee tehnologice",* UPB, 2003. 6) L. Balteș – "*Ştiinţa si ingineria materialelor*", Reprografia Universităţii "Transilvania"Braşov, 2004. 7) G. Oprea – "*Chimie fizică. Teorie şi aplicaţii",* Editura Risoprint, Cluj Napoca, 2005, ISBN 973-656-909-8. 8) D. Hoble, Livia Bandici, Șt. Nagy - „*Sisteme performante de procesare electrotermică a materialelor*", Editura Universităţii din Oradea, 2012, (ISBN 978-606-10-0767-7). 9) **Livia Bandici**, D. Hoble, Șt. Nagy – „*Tehnologii inovative în procesarea materialelor*", Editura Universităţii din Oradea, 2011, (ISBN 978-606-10-0472-0). 10) **Livia Bandici**, Dorel Hoble, Stefan Nagy – "*Tehnologii inovative în procesarea materialelor"*. Editura Universităţii din Oradea, 2011, pag. 224, ISBN 978-606-10-0472-0.		
8.2 Laboratory	Teaching methods	No. of hours/ Observations
1. Presentation of the paper, instructions on the work safety rules, processing of the experimental data	- Presentation of the paper (synthesis material); - Test on the theoretical knowledge	2

	aquired during the laboratory; - Interpretation of the results.	
2. Standardization in the machine industry and in electrical engineering	Idem	2
3. Metals and alloys used in the electrotechnical industry	Idem	2
4. Cold treatment technologies	Idem	2
5 Heat treatment technologies	Idem	2
6. The use of MACH4	Idem	2
7. Closing the laboratory situation.	- presenting and handing out the laboratory papers; - the recovery of one missed laboratory is allowed.	2

Bibliography

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3) F. Anghel, M.O. Popescu - "*Tehnologii Electromecanice*", UPB, 2001.

4) F. Anghel, I. Bestea - "*Tehnologii Electromecanice – Aplicaţii practice*", UPB, 2003.

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9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

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10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	Minimum required conditions for passing the exam (mark 5): in accordance with the minimum performance standard	The evaluation can be done face to face or online.	50 % from 0,5 VP_F;
10.5 Laboratory	Minimum required conditions for promotion (grade 5): in accordance with the minimum performance standard		
Note components: Final Periodic Verification (VPF), Laboratory (LF) Grade calculation formula: VP Grade = 0.5VPF + 0.5LF; LF = 0.450L + 0.05R; VPF = (VPI + VPII) / 2;			
10.6 Minimum performance standard: Carrying out works under coordination, in order to solve some problems specific to the field, with the correct evaluation of the workload, the available resources, the necessary completion time and the risks, in conditions of application of the norms of safety and health at work; Adequate use of basic knowledge of technological methods and processes used in the machine building and electrical engineering industries.			

Completion date:
29.08.2022

Date of endorsement in the department:
01.09.2022

Date of endorsement in the Faculty Board:

23.09.2022

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	Department of Control Systems Engineering and Management
1.4 Field of study	Engineering and Management
1.5 Study cycle	Bachelor (1st cycle)
1.6 Study program/Qualification	Economic Engineering in Electric, Electronic and Energetic Field / Bachelor of Engineering

2. Data related to the subject

2.1 Name of the subject		Numerical Methods					
2.2 Holder of the subject		Lecturer PhD eng. **Novac Cornelia Mihaela**					
2.3 Holder of the academic seminar/laboratory/project		Lecturer PhD eng. **Novac Cornelia Mihaela**					
2.4 Year of study	2	2.5 Semester	3	2.6 Type of the evaluation	Vp - Continuous Assessment	2.7 Subject regime	DF

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

3.1 Number of hours per week		of which: 3.2 course		3.3 academic laboratory	2
3.4 Total of hours from the curriculum	56	Of which: 3.5 course	28	3.6 academic laboratory	28
Distribution of time					44 hours
Study using the manual, course support, bibliography and handwritten notes					20
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					10
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					10
Tutorials					
Examinations					4
Other activities.					

3.7 Total of hours for individual study	**44**
3.9 Total of hours per semester	**100**
3.10 Number of credits	4

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions) - Computer skills, linear algebra and mathematical analysis
4.2 related to skills	-

5. Conditions (where applicable)

5.1. for the development of the course	- The course room has to be provided with a video-projector - The course can be carried out face to face or online

5.2.for the development of the academic seminary/laboratory/project	- Personal computers with dedicated software programs (Matlab); - Students presence to all laboratory hours is compulsory - The laboratory hours can be carried out face to face or online

6. Specific skills acquired	
Professional skills	C1. Make calculations, demonstrations and applications in order to solve specific engineering and management tasks, based on knowledge achieved from fundamental sciences and engineering sciences.
Transversal skills	

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	The discipline "Numerical methods" aims to familiarize students with the features of the basic principles of numerical methods; the practical interpretation of the formulas from the methods presented with the help of a calculation system and the realization of some calculation programs with applications in engineering, written in the Matlab programming language.
7.2 Specific objectives	After completing the discipline "Numerical methods", students acquire the following skills: □ Knowledge and adequate use of notions specific to numerical calculation; □ Understanding the content and essence of laboratory work; □ Application of numerical methods in engineering problems; □ Using the Matlab programming language for numerical calculation in engineering; □ Choosing the numerical method appropriate to each type of problem; □ Solving with the help of a calculation system the more complex engineering problems, for which the analytical solutions do not exist, or are unsatisfactory. □ Acquiring the ability to use what they have learned in this discipline in the case of a rigorous and abstract approach to practical problems that may arise in further research (master's, doctorate)

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
1.Matlab programming fundamentals	Interactive lecture + video projector / Online	2
2. Introduction in Matlab programming.	Interactive lecture + video projector / Online	4
3. Errors in numerical calculation	Interactive lecture + video projector / Online	2
4. Numerical methods to solve algebric linear systems equations. Exact methods.	Interactive lecture + video projector / Online	2
5. Numerical methods to solve algebric linear systems equations. Iterative methods.	Interactive lecture + video projector / Online	2
6. Numerical methods to solve nonlinear equations	Interactive lecture + video projector / Online	2
7. Interpolation	Interactive lecture + video projector / Online	4
8. Functions approximation	Interactive lecture + video projector / Online	2
9.Numerical integration	Interactive lecture + video projector / Online	2

10.Numerical derivation	Interactive lecture + video projector / Online	2
11.Numerical methods to solve differential equations	Interactive lecture + video projector / Online	4
Bibliography 1. Mihaela Novac-" Metode numerice", Editura Universităţii din Oradea, 2005. 2. Mihaela Novac, O. Novac - "Metode numerice utilizând Matlab", Editura Universităţii din Oradea, 2003. 3. Mihaela Novac - "Metode numerice îndrumător de laborator", Editura Universităţii din Oradea, 2012. 4. M. Ghinea, V. Fireţeanu, - " Matlab calculul numeric-grafică-aplicaţii.", Editura Teora, 1997. 5. I.A Viorel,D. M. Ivan – "Metode numerice cu aplicaţii în ingineria electrică", Editura Universităţii din Oradea, 2000.		
8.2 Laboratory	Teaching methods	No. of hours/ Observations
1. Using the Matlab programming environment	Application programs using Matlab	2
2. Build function files in Matlab	Application programs using Matlab	2
3. Using the Matlab graphics environment. Building 2D and 3D graphics.	Application programs using Matlab	2
4. Programs for solving algebric linear systems equations. Exact methods.	Application programs using Matlab	4
5. Programs for solving algebric linear systems equations. Iterative methods	Application programs using Matlab	2
6. Matlab programs for polynomial interpolation	Application programs using Matlab	2
7. Functions approximation. Matlab programs for linear regression and polynomial regression.	Application programs using Matlab	4
8. Matlab programs for solving nonlinear equations	Application programs using Matlab	2
9. Matlab programs for solving numerical derivation	Application programs using Matlab	2
10. Matlab programs for solving numerical integration	Application programs using Matlab	2
11. Matlab programs for solving differential equations	Application programs using Matlab	2
12. Evaluation of laboratory activity.		2
Bibliography 1. Mihaela Novac-" Metode numerice utilizând Matlab pt. ingineri", Editura Universităţii din Oradea, 2014 2. Mihaela Novac-" Metode numerice", Editura Universităţii din Oradea, 2005. 3. Mihaela Novac, O. Novac - "Metode numerice utilizând Matlab", Editura Universităţii din Oradea, 2003. 4. Mihaela Novac - "Metode numerice îndrumător de laborator", Editura Universităţii din Oradea, 2012. 5. M. Ghinea, V. Fireţeanu, - " Matlab calculul numeric-grafică-aplicaţii.", Editura Teora, 1997. 6. I.A Viorel,D. M. Ivan – "Metode numerice cu aplicaţii în ingineria electrică", Editura Universităţii din Oradea, 2000.		

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the subject is in accordance with the one in other national or international universities. In order to provide a better accomodation to the labour market requirements, there have been organized meetings both with representatives of the socio-economic environment and with academic staff with similar professional interest fields.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	- Knowledge and proper use of notions specific to numerical calculation;	Continuous Assessment, practical computer applications / Online assessment (Online questionnaire)	70 %
10.6 Laboratory	- Realization of all laboratory applications	Practical application	30 %
10.8 Minimum performance standard: -			

Completion date:
29.08.2022

Date of endorsement in the department:
1.09.2022

Date of endorsement in the Faculty Board:
23.09.2022

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Control Systems Engineering and Management**
1.4 Field of study	**Engineering and Management**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**ECONOMIC ENGINEERING IN ELECTRIC, ELECTRONIC AND ENERGETIC FIELD / Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject			**ELECTRIC AND ELECTRONIC MEASUREMENTS I**				
2.2 Holder of the subject			Prof. univ. dr. ing. habil. IOAN MIRCEA GORDAN				
2.3 Holder of the academic seminar/laboratory/project			Asist. univ. dr. ing. MARIUS CODREAN				
2.4 Year of study	II	2.5 Semester	3	2.6 Type of the evaluation	EX.	2.7 Subject regime	FD

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

3.1 Number of hours per week	3	of which: 3.2 course	2	3.3 academic laboratory	1
3.4 Total of hours from the curriculum	42	Of which: 3.5 course	28	3.6 academic laboratory	14
Distribution of time					33 hours
Study using the manual, course support, bibliography and handwritten notes					10
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					7
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					9
Tutorials					-
Examinations					7
Other activities.					-

3.7 Total of hours for individual study	**33**
3.9 Total of hours per semester	**75**
3.10 Number of credits	**3**

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	video projector presentation
5.2.for the development of the academic seminary/laboratory/project	The existence of the apparatus and equipment necessary for the development in optimal conditions of the works provided in the discipline file. Providing students with the laboratory guide in printed or electronic format.
6. Specific skills acquired	

Professional skills	▪ **C1. Make calculations, demonstrations and applications in order to solve specific engineering and management tasks, based on knowledge achieved from fundamental sciences and engineering sciences.** - Adequate identification, definition and selection, in professional communication, of basic concepts, theories and methods in fundamental sciences and engineering. - The use of basic knowledge from fundamental and engineering disciplines to explain and interpret theoretical results, theorems, phenomena or processes specific to the field of Engineering and Management. - Application of theorems, principles and fundamental methods for calculations and for solving well-defined problems, specific to the field of Engineering and Management, in conditions of qualified assistance. - The adequate use of fundamental evaluation criteria and methods, for the identification, modeling, analysis and qualitative and quantitative appreciation of some characteristic phenomena, processes and theories, as well as to process and interpret the results of specific processes in the field of engineering and management. - Elaboration of professional models and projects by selecting and using established principles, methods and solutions from the fundamental and engineering disciplines of the field of engineering and management. ▪ **C5. Technical and technological design of processes belonging to electric, electronic and energy engineering systems, structures and industry, according to quality requirements.** - Identification, selection of terminology, concepts and methods in the technical and technological design of processes in the electrical, electronic and energy industries. - Using basic knowledge to explain and interpret problems that occur in the technical and technological design of electrical, electronic and energy processes in compliance with quality conditions. - Application of basic principles and methods for technical and technological design specific to electrical, electronic and energy processes under conditions of qualified assistance. - Appropriate use of standard evaluation criteria and methods to assess the quality, advantages and limitations of technical and technological projects associated with electrical, electronic and energy processes. - Elaboration of technical and technological projects related to the processes of activities in the electrical, electronic and energetic field, by using established methods and principles.
Transversal skills	

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ The course is taught to second year *Economic engineering in electric, electronic and energetic field* students. The course addresses notions that will allow future graduates to have a rich background on the use of techniques for measuring electrical and non-electrical quantities and data acquisition systems in electromechanical systems.
7.2 Specific objectives	▪ Explaining and interpreting the phenomena presented in the field and specialty disciplines, using the basic knowledge of mathematics, physics, chemistry ▪ Application of general scientific rules and methods for solving problems specific to electrical engineering ▪ Explanation and interpretation of the operating modes of static, electromechanical converters, ▪ of electrical and electromechanical equipment ▪ Identification of electromechanical systems according to their composition mathematical modeling, as well as their kinematic and dynamic description ▪ Adequate description of the basic concepts and principles of electrical engineering measurement and data acquisition techniques ▪ Explanation of the means and methods of measurement, as well as the operation of instruments, devices and installations for measuring various technical quantities ▪ Application of the basic principles of measurement technique and data acquisition for determining electrical and non-electrical quantities in electromechanical systems. ▪ Appropriate use of measuring devices and data acquisition systems for performance evaluation and monitoring of electromechanical systems. ▪ Design of electromechanical installations including measuring devices and digital data acquisition systems. ▪ Developing a positive attitude towards the activities of assimilating new professional knowledge and information, cultivating and promoting a scientific environment focused on values, forming a positive and responsible professional behavior.

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
Chapter I INTRODUCTION 1.1. The object of the science of measurement 1.2. Classification of measurable quantities 1.3. The legal system of units of measurement 1.4. Standards	Interactive lecture; exposure; video projector presentation	2 hours
Chapter II ELECTRICAL METHODS AND MEASURES. METROLOGICAL CHARACTERISTICS 3.1. The measurement process 3.2. Classification of electrical measurement methods 3.3. Hierarchy of electrical measurement methods 3.4. Definition of electrical measuring instruments 3.5. Functional diagrams of electrical measuring instruments 3.6. Metrological characteristics of electrical measuring instruments	Interactive lecture; exposure; video projector presentation	4 hours
Chapter III MEASUREMENT ERRORS 2.1. Classification of measurement errors 2.2. Estimation of random errors 2.3. Estimation of systematic errors 2.4. Estimation of total errors for indirect measurement methods 2.5. Processing and presentation of measurement results 2.6. Informational interpretation of measurement errors	Interactive lecture; exposure; video projector presentation	4 hours
Chapter IV MEASURING MEANS IN DYNAMIC REGIME 4.1. Overview 4.2. Typical behaviors of measuring instruments	Interactive lecture; exposure; video projector presentation	4 hours
Chapter V ANALOGUE MEASURING MEASURES 5.1. Principles of operation of electromechanical instruments 5.2. Constructive elements of electromechanical instruments	Interactive lecture; exposure; video projector presentation	6 hours
Chapter VI. PROCESSING OF ANALOG SIGNALS 6.1. shunt 6.2. Additional resistor 6.3. Voltage dividers 6.4. Measuring transformers 6.5. Measuring amplifiers	Interactive lecture; exposure; video projector presentation	4 hours
Chapter VII. DIGITAL MEASURERS 7.1. Working principle and characteristics of digital devices 7.2. Components of digital devices 7.3. Digital display devices	Interactive lecture; exposure; video projector presentation	4 hours

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1. Gordan M., - Măsurări electrice în electrotehnică, Ed. Universităţii din Oradea, 2003.
2. Gordan M., - Măsurări electrice şi sisteme de măsurare, Ed. Universităţii din Oradea, 2001.
3. Gordan M. – Măsurări electrice şi electronice, Ed. Universităţii din Oradea, 1999.
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5. Gordan M., - Echipamente de măsură şi control, Ed. Universităţii din Oradea, 2003.
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12. Ștefănescu C., Cupcea N., - Sisteme inteligente de măsurare și control, Ed. Albastră Cluj-Napoca 2002.
12. Gordan M. şi colab. - Măsurări electrice în electrotehnică – Îndrumător de laborator, Ed. Universităţii din Oradea, 2003.
13. Gordan M., Tomşe M., - Măsurări în energetică - Îndrumător de laborator, Lito. Univ. din Oradea, 1999.
14. Gordan M., Tomşe M., - Măsurări electrice şi electronice - Îndrumător de laborator, Lito Univ. din Oradea, 1997.

8.2 Academic seminar	Teaching methods	No. of hours/ Observations
8.3 Academic laboratory		

1. Presentation of the content and requirements required for the proper conduct of laboratory work. Estimation of measurement errors and interpretation of results.	Practical application. Discussions	2 hours
2. Metrological verification of indicator measuring instruments. Metrological verification of digital voltmeters.	Practical application. Discussions	2 hours
3. Measurement of voltages and currents.	Practical application. Discussions	2 hours
4. Checking the cathode ray oscilloscope.	Practical application. Discussions	2 hours
5. Real-time oscilloscope measurements.	Practical application. Discussions	2 hours
6. Measurement of resistances by volt - ammeter method. Measuring resistances with simple direct current bridge.	Practical application. Discussions	2 hours
7. Recovery of laboratories. Ending the school situation.	Practical application. Discussions	2 hours
8.4 Academic project	--	--

Bibliography

1. Gordan M., - Măsurări electrice în electrotehnică, Ed. Universităţii din Oradea, 2003.
2. Gordan M., - Măsurări electrice şi sisteme de măsurare, Ed. Universităţii din Oradea, 2001.
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8. E. Nicolau şi colectiv - Manualul inginerului electronist, E.T. Bucureşti 1980.
9. Tânovan I. G., Metrologie electrică şi instrumentaţie, Ed. Mediamira Cluj - Napoca 2003.
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12. Ştefănescu C., Cupcea N., - Sisteme inteligente de măsurare şi control, Ed. Albastră Cluj-Napoca 2002.
12. Gordan M. şi colab. - Măsurări electrice în electrotehnică – Îndrumător de laborator, Ed. Universităţii din Oradea, 2003.
13. Gordan M., Tomşe M., - Măsurări în energetică - Îndrumător de laborator, Lito. Univ. din Oradea, 1999.
14. Gordan M., Tomşe M., - Măsurări electrice şi electronice - Îndrumător de laborator, Lito Univ. din Oradea, 1997.
15. D. Belege, G. Gasparesc – Măsurări electrice și electronice. Aplicații practice, Ed. Politehnica Timișoara, 2019.

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

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10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	Active participation in developed discussions. Documented arguments. Providing relevant solutions to the issues under debate. Knowledge of the basics on all topics covered.	Oral, online or written assessment. Discussions. Argue.	70%
10.5 Academic seminar	--	--	--
10.6 Laboratory	Written test marked with a minimum of 5. Practical realization of all the requirements imposed by the laboratory work. Well-documented arguments. Reading the required bibliography.	Written test. Practical test. Online test. Discussions. Argue.	30%
10.7 Project	--	--	--

10.8 Minimum performance standard: - obtaining a grade of 5 in each laboratory test; participation and fulfillment of all requirements imposed by each laboratory work; obtaining a grade of 5 in the course tests, as an arithmetic mean of the grades obtained in this type of activity. Knowledge of the basics on all the topics taught.

Completion date:	29.08.2022
Date of endorsement in the department:	01.09.2022
Date of endorsement in the Faculty Board:	23.09.2022

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	**Department of Electrical Engineering**
1.4 Field of study	**Electrical Engineering**
1.5 Study cycle	**Bachelor (1st cycle)**
1.6 Study program/Qualification	**ECONOMIC ENGINEERING IN ELECTRIC, ELECTRONIC AND ENERGETIC FIELD / Bachelor of Engineering**

2. Data related to the subject

2.1 Name of the subject				**ELECTRIC AND ELECTRONIC MEASUREMENTS II**			
2.2 Holder of the subject				Prof. univ. dr. ing. habil. IOAN MIRCEA GORDAN			
2.3 Holder of the academic seminar/laboratory/project				Şef lucrări dr. ing. RADU SEBEŞAN			
2.4 Year of study	II	2.5 Semester	4	2.6 Type of the evaluation	EX.	2.7 Subject regime	FD

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

3.1 Number of hours per week	3	of which: 3.2 course	2	3.3 academic laboratory	1
3.4 Total of hours from the curriculum	42	Of which: 3.5 course	28	3.6 academic laboratory	14
Distribution of time					33 hours
Study using the manual, course support, bibliography and handwritten notes					10
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					7
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					9
Tutorials					-
Examinations					7
Other activities.					-
3.7 Total of hours for individual study	**33**				
3.9 Total of hours per semester	**75**				
3.10 Number of credits	**3**				

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	video projector presentation
5.2.for the development of the academic seminary/laboratory/project	The existence of the apparatus and equipment necessary for the development in optimal conditions of the works provided in the discipline file. Providing students with the laboratory guide in printed or electronic format.
6. Specific skills acquired	

Professional skills	▪ **C1. Make calculations, demonstrations and applications in order to solve specific engineering and management tasks, based on knowledge achieved from fundamental sciences and engineering sciences.** - Adequate identification, definition and selection, in professional communication, of basic concepts, theories and methods in fundamental sciences and engineering. - The use of basic knowledge from fundamental and engineering disciplines to explain and interpret theoretical results, theorems, phenomena or processes specific to the field of Engineering and Management. - Application of theorems, principles and fundamental methods for calculations and for solving well-defined problems, specific to the field of Engineering and Management, in conditions of qualified assistance. - The adequate use of fundamental evaluation criteria and methods, for the identification, modeling, analysis and qualitative and quantitative appreciation of some characteristic phenomena, processes and theories, as well as to process and interpret the results of specific processes in the field of engineering and management. - Elaboration of professional models and projects by selecting and using established principles, methods and solutions from the fundamental and engineering disciplines of the field of engineering and management. ▪ **C5. Technical and technological design of processes belonging to electric, electronic and energy engineering systems, structures and industry, according to quality requirements.** - Identification, selection of terminology, concepts and methods in the technical and technological design of processes in the electrical, electronic and energy industries. - Using basic knowledge to explain and interpret problems that occur in the technical and technological design of electrical, electronic and energy processes in compliance with quality conditions. - Application of basic principles and methods for technical and technological design specific to electrical, electronic and energy processes under conditions of qualified assistance. - Appropriate use of standard evaluation criteria and methods to assess the quality, advantages and limitations of technical and technological projects associated with electrical, electronic and energy processes. - Elaboration of technical and technological projects related to the processes of activities in the electrical, electronic and energetic field, by using established methods and principles.
Transversal skills	

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ The course is taught to second year *Economic engineering in electric, electronic and energetic field* students. The course addresses notions that will allow future graduates to have a rich background on the use of techniques for measuring electrical and non-electrical quantities and data acquisition systems in electromechanical systems.
7.2 Specific objectives	▪ Explaining and interpreting the phenomena presented in the field and specialty disciplines, using the basic knowledge of mathematics, physics, chemistry ▪ Application of general scientific rules and methods for solving problems specific to electrical engineering ▪ Explanation and interpretation of the operating modes of static, electromechanical converters, ▪ of electrical and electromechanical equipment ▪ Identification of electromechanical systems according to their composition mathematical modeling, as well as their kinematic and dynamic description ▪ Adequate description of the basic concepts and principles of electrical engineering measurement and data acquisition techniques ▪ Explanation of the means and methods of measurement, as well as the operation of instruments, devices and installations for measuring various technical quantities ▪ Application of the basic principles of measurement technique and data acquisition for determining electrical and non-electrical quantities in electromechanical systems. ▪ Appropriate use of measuring devices and data acquisition systems for performance evaluation and monitoring of electromechanical systems. ▪ Design of electromechanical installations including measuring devices and digital data acquisition systems. ▪ Developing a positive attitude towards the activities of assimilating new professional knowledge and information, cultivating and promoting a scientific environment focused on values, forming a positive and responsible professional behavior.

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
Chapter VIII MEASUREMENT OF ELECTRIC CURRENT AND VOLTAGE 8.1. Current measurement. 8.2. Methods and means of measuring electrical voltage.	Interactive lecture; exposure; video projector presentation	6 hours
Chapter IX ELECTRICAL POWER MEASUREMENT 10.1. Introduction. 10.2. Power measurement in c. c. and c.a. single phase with electrodynamic wattmeter. 10.3. Active power measurement in polyphase circuits. 10.4. Reactive power measurement.	Interactive lecture; exposure; video projector presentation	4 hours
Chapter X MEASUREMENT OF ELECTRICAL ENERGY 11.1. Generalities. 11.2. Measurement of active energy in single-phase alternating current circuits. 11.3. Single phase induction meter. 11.4. Electronic meters for measuring energy.	Interactive lecture; exposure; video projector presentation	2 hours
Chapter XI MEASUREMENT OF ELECTRICAL ENERGY 11.1. Generalities. 11.2. Measurement of active energy in single-phase alternating current circuits. 11.3. Single phase induction meter. 11.4. Electronic meters for measuring energy.	Interactive lecture; exposure; video projector presentation	2 hours
Chapter XII ARCHITECTURE OF ANALOG DATA ACQUISITION AND GENERATION SYSTEMS [1] 12.1. Generalities. 12.2. Data acquisition systems (DAS). 12.3. Data generation systems (DGS). 12.4. Interface techniques.	Interactive lecture; exposure; video projector presentation	4 hours
Chapter XIII. ELECTRIC TRANSDUCERS 13.1. General considerations; 13.2. Resistive transducers; 13.3. Capacitive transducers; 13.4. Inductive transducers; 13.5. Induction transducers; 13.6. Thermoelectric transducers; 13.7. Galvanomagnetic transducers; 13.8. Photoelectric transducers; 13.9. Piezoelectric transducers.	Interactive lecture; exposure; video projector presentation	6 hours
Chapter XIV. CATHODIC OSCILLOSCOPE 14.1. Overview. 14.2. Real-time oscilloscope. 14.3. Special oscilloscopes.	Interactive lecture; exposure; video projector presentation	4 hours

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1. Gordan M., - Măsurări electrice în electrotehnică, Ed. Universităţii din Oradea, 2003.
2. Gordan M., - Măsurări electrice şi sisteme de măsurare, Ed. Universităţii din Oradea, 2001.
3. Gordan M. – Măsurări electrice şi electronice, Ed. Universităţii din Oradea, 1999.
4. Gordan M. – Măsurări electrice şi electronice – Culegere de probleme, Lito Univ. din Oradea, 1998.
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9. Tânovan I. G., Metrologie electrică şi instrumentaţie, Ed. Mediamira Cluj - Napoca 2003.
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12. Ştefănescu C., Cupcea N., - Sisteme inteligente de măsurare şi control, Ed. Albastră Cluj-Napoca 2002.

12. Gordan M. şi colab. - Măsurări electrice în electrotehnică – Îndrumător de laborator, Ed. Universităţii din Oradea, 2003. 13. Gordan M., Tomşe M., - Măsurări în energetică - Îndrumător de laborator, Lito. Univ. din Oradea, 1999. 14. Gordan M., Tomşe M., - Măsurări electrice şi electronice - Îndrumător de laborator, Lito Univ. din Oradea, 1997.		
8.2 Academic seminar	Teaching methods	No. of hours/ Observations
8.3 Academic laboratory		
1. Presentation of the content and requirements required for the proper conduct of laboratory work. Power measurement in c.c. circuits.	Practical application. Discussions	2 hours
2. Measurement of active power and determination of consumer characteristics in single-phase alternating current circuits. Measurement of active and reactive power in three-phase circuits. Active energy measurement	Practical application. Discussions	2 hours
3. Study of light emitting diodes. LED displays. Study of liquid crystal displays.	Practical application. Discussions	2 hours
4. The study of galvanomagnetic transducers. Thermoelectric transducers.	Practical application. Discussions	2 hours
5. Introduction to the LabView interface program. Realization of a simple virtual instrument device.	Practical application. Discussions	2 hours
6. Modern measuring systems I. Acquisition boards and virtual instruments. Acquisitions and data generation.	Practical application. Discussions	2 hours
7. Recovery of laboratories. Ending the school situation.	Practical application. Discussions	2 hours
8.4 Academic project	--	--

Bibliography

1. Gordan M., - Măsurări electrice în electrotehnică, Ed. Universităţii din Oradea, 2003.
2. Gordan M., - Măsurări electrice şi sisteme de măsurare, Ed. Universităţii din Oradea, 2001.
3. Gordan M. – Măsurări electrice şi electronice, Ed. Universităţii din Oradea, 1999.
4. Gordan M. – Măsurări electrice şi electronice – Culegere de probleme, Lito Univ. din Oradea, 1998.
5. Gordan M., - Echipamente de măsură şi control, Ed. Universităţii din Oradea, 2003.
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7. G. Ionescu - Măsurări și traductoare, E.D.P. București 1985.
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9. Tânovan I. G., Metrologie electrică şi instrumentaţie, Ed. Mediamira Cluj - Napoca 2003.
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11. Pop E., Stoica V., Naforniţa I., Petriu E., - Tehnici moderne de măsurare, Ed. Facla Timişoara 1983.
12. Ştefănescu C., Cupcea N., - Sisteme inteligente de măsurare şi control, Ed. Albastră Cluj-Napoca 2002.
12. Gordan M. şi colab. - Măsurări electrice în electrotehnică – Îndrumător de laborator, Ed. Universităţii din Oradea, 2003.
13. Gordan M., Tomşe M., - Măsurări în energetică - Îndrumător de laborator, Lito. Univ. din Oradea, 1999.
14. Gordan M., Tomşe M., - Măsurări electrice şi electronice - Îndrumător de laborator, Lito Univ. din Oradea, 1997.
15. D. Belege, G. Gasparesc – Măsurări electrice şi electronice. Aplicaţii practice, Ed. Politehnica Timişoara, 2019.

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

-

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	Active participation in developed discussions. Documented arguments. Providing relevant solutions to the issues under debate. Knowledge	Oral, online or written assessment.. Discussions. Argue.	70%

	of the basics on all topics covered.		
10.5 Academic seminar	--	--	--
10.6 Laboratory	Written test marked with a minimum of 5. Practical realization of all the requirements imposed by the laboratory work. Well-documented arguments. Reading the required bibliography.	Written test. Practical test. Online test. Discussions. Argue.	30%
10.7 Project	--	--	--
10.8 Minimum performance standard: - obtaining a grade of 5 in each laboratory test; participation and fulfillment of all requirements imposed by each laboratory work; obtaining a grade of 5 in the course tests, as an arithmetic mean of the grades obtained in this type of activity. Knowledge of the basics on all the topics taught.			

Completion date: 29.08.2022

Date of endorsement in the department: 01.09.2022

Date of endorsement in the Faculty Board: 23.09.2022

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	Automated Systems Engineering and Management
1.4 Field of study	Electrical engineering
1.5 Study cycle	Bachelor (1st cycle)
1.6 Study program/Qualification	ECONOMIC ENGINEERING IN THE ELECTRICAL, ELECTRONIC AND ENERGY FIELD / Bachelor of Engineering

2. Data related to the subject

2.1 Name of the subject		**Electrical equipments**					
2.2 Holder of the subject		Lecturer dr. ing. Stașac Claudia Olimpia					
2.3 Holder of the academic seminar/laboratory/project		Lecturer dr. ing. Stașac Claudia Olimpia					
2.4 Year of study	3	2.5 Semester	5	2.6 Type of the evaluation	Ex - Examination	2.7 Subject regime	Domain Discipline

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

3.1 Number of hours per week	4	of which: 3.2 course	2	3.3 academic seminar/laboratory/project	-/1/-
3.4 Total of hours from the curriculum	42	Of which: 3.5 course	28	3.6 academic seminar/laboratory/project	-/14/-
Distribution of time					56 hours
Study using the manual, course support, bibliography and handwritten notes					20
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					20
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					8
Tutorials					4
Examinations					4
Other activities.					
3.7 Total of hours for individual study	**56**				
3.9 Total of hours per semester	**104**				
3.10 Number of credits	4				

4. Pre-requisites (where applicable)

4.1 related to the curriculum	Electrotechnics, Electrical Technology
4.2 related to skills	Knowledge of electrical diagram symbols.

5. Conditions (where applicable)

5.1. for the development of the course	The course can be held face-to-face or online
5.2.for the development of the academic	the laboratory can be carried out face to face or online - Equipment related to laboratory hours - Preparation of the report, knowledge of the notions

seminary/laboratory/project	contained in the laboratory work to be performed (synthesis material); - Carrying out all laboratory work.
6. Specific skills acquired	
Professional skills	C1. Performing calculations, demonstrations and applications to solve specific tasks of engineering and management based on knowledge in science fundamental and engineering C5. Technical and technological design of processes regarding structures and systems in the electrical, electronic and energy fields under quality conditions, technical and technological design of processes in the electrical, electronic and energy industries, in given quality conditions
Transversal skills	· CT3. Identifying opportunities for continuous training and efficient use, for one's own development, of information sources and resources communication and assisted professional training (Internet portals, specialized software applications, databases, online courses, etc.) both in Romanian, as well as in a language of international circulation.

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ The Electrical Equipment course is designed to present modern interdisciplinary issues regarding the study of electrical equipment. Through the approached topic, the course is meant to allow students to acquire basic knowledge, in the first stage, on the main phenomena that occur in the operation of electrical appliances, and in the second stage of knowledge on the maintenance of electrical equipment . The course is also meant to facilitate students to develop skills and competencies in the issue of correct choice of equipment that is part of electrical installations.
7.2 Specific objectives	▪ The laboratory works are designed to provide future electromechanical engineers with practical skills in the study, maintenance of electrical appliances, construction, research, operation, repair and maintenance of electrothermal installations. The content of the seminar presented is based on the need to deepen the problems presented in the course. Students have the opportunity to identify electrical supply diagrams of electrical equipment, familiarity with modern means of measuring temperature, electrical parameters during the operation of electrical equipment. They will understand the complexity and usefulness and maintenance of these facilities and will treat them as such. Knowledge is useful in developing skills in addressing the specific problems faced by a specialist in electromechanics.

8. Contents*

8.1 Course	Teaching methods Teaching is done "online", or "face-to-face" depending on requirements	No. of hours/ Observations
1. The place and importance of electrical equipment in industrial installations	During the teaching, students' contributions on the specific topics of the course are requested. Some courses are conducted by teaching topics and debating them by students.	2

2. Clasification of the electrical devices	idem	2
3. Electrical contact	idem	2
4. Calculation of resistance and heating of contacts	idem	2
5. Thermal effects in electrical equipments	idem	2
6. Electromagnet as a component of electrical apparatus	idem	2
9. Relays and triggers. Operating characteristics. Constructive types.	idem	2
10 .. Intermediate, current and time relays. Their role, construction and typical patterns of use	idem	2
11. Contactors. Their role, construction and typical patterns of use	idem	2
12. Low voltage circuit breakers. Principles of electric arc extinguishing	idem	2
13. Medium and high voltage circuit breakers. Separators. Role, constructive types	idem	2
14. Modern trends in the construction of electrical equipment	idem	2

Bibliography

[1]. C. Stasac, D. Hoble – Electric devices. Fundamentals and applications - University of Oradea Publishing House - 2022

[2]. D. Hoble, C. Staşac - Electrical Apparatus and Equipment - University of Oradea Publishing House - 2004

[3] D. Hoble, C. Cheregi - Electrical Installations - University of Oradea Publishing House - 2004

[4] I. Hortopan - Electrical appliances - EDP 1996

[5] T.Maghiar, D.Hoble, L.Bandici - Installations and use of electricity - University of Oradea Publishing House - 2000

[6] D.Hoble - Electrical appliances: Practical applications - Oradea University Publishing House - 2002

[7] T. Maghiar D. Hoble .S. Paşca, M.Popa - - Installations and use of electricity Laboratory guide - University of Oradea - 1998

8.2 Laboratory	Teaching methods	No. of hours/ Observations
1. Electrical contacts. The influence of the pressing force.	Presentation to the students of the prepared report (synthesis material). The laboratory guide can be found in printed format in the Laboratory, and in the University Library, the students having permanent access to the didactic materials. - Test regarding the theoretical knowledge related to the seminar -	2

	Carrying out experimental determinations - Interpretation of the obtained results.	
2. The electromagnet. Construction. Operation.	idem	2
3. The electromagnet. The influence of the air gap. Coil cage.	idem	2
4. Fuses. Automatic fuses.	idem	2
5. Relays and triggers.	idem	2
6. Electrical contactors.	idem	2
7. Realization of a complex scheme on the existing modules in the laboratory. Practical realization.	idem	2
	idem	2

Bibliography

[1]. D. Hoble, C. Staşac - Electrical Apparatus and Equipment - University of Oradea Publishing House – 2004
[2] D. Hoble, C. Cheregi - Electrical Installations - University of Oradea Publishing House - 2004
[3] I. Hortopan - Electrical appliances - EDP 1996
[4] T.Maghiar, D.Hoble, L.Bandici - Installations and use of electricity - University of Oradea Publishing House - 2000
[5] D.Hoble - Electrical appliances: Practical applications - Oradea University Publishing House - 2002
[6] T. Maghiar D. Hoble .S. Paşca, M.Popa - - Installations and use of electricity Laboratory guide - University of Oradea – 1998
[7] *** Catalogs of existing laboratory equipment.

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the subject is in accordance with the one in other national or international universities. In order to provide a better accomodation to the labour market requirements, there have been organized meetings both with representatives of the socio-economic environment and with academic staff with similar professional interest fields.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	-- For grade 5: all subjects must be treated to minimum standards; For grades> 5 all subjects must be treated to standards imposed by the grading scale;	Written examination	75 %
10.6 Laboratory	-- In the last laboratory session the students will present the works performed, respectively the results obtained.	Knowledge assessment test	25 %
10.8 Minimum performance standard: - Carrying out works under the coordination of a teacher, to solve specific problems of the study of electrical equipment and maintenance, maintenance and diagnosis of electrical equipment with the correct assessment of workload, available resources, time required and risks, in conditions of application of occupational safety and health regulations. Principle of operation and maintenance diagnosis, composition of electrical equipment.			

Completion date	Course owner's signature	Signature of the laboratory owner
29.08.2022		
	Lecturer. dr. ing. STAȘAC CLAUDIA OLIMPIA	Lecturer dr. ing. STAȘAC CLAUDIA OLIMPIA

Date of endorsement in the
Electrical Engineering department:

01.09.2022 Prof.univ. dr. ing.inf.habil. Hathazi Francisc Ioan

Date of endorsement in the
Automated Systems Engineering and
Management department**:**

Prof. univ. dr. ing. Helga Silaghi

22.09.2022

Date of endorsement in the Faculty Board:
23.09.2022 Prof.univ.dr.ing.habil. Mircea Gordan

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	Automated Systems Engineering and Management
1.4 Field of study	Electrical engineering
1.5 Study cycle	Bachelor (1st cycle)
1.6 Study program/Qualification	ECONOMIC ENGINEERING IN THE ELECTRICAL, ELECTRONIC AND ENERGY FIELD / Bachelor of Engineering

2. Data related to the subject

2.1 Name of the subject		**Electrotechnic materials**					
2.2 Holder of the subject		Lecturer dr.ing. Stașac Claudia Olimpia					
2.3 Holder of the academic seminar/laboratory/project		Lecturer dr.ing. Stașac Claudia Olimpia					
2.4 Year of study	2	2.5 Semester	6	2.6 Type of the evaluation	Ex - Examination	2.7 Subject regime	Domain Discipline

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

3.1 Number of hours per week	4	of which: 3.2 course	2	3.3 academic seminar/laboratory/project	-/2/-
3.4 Total of hours from the curriculum	56	Of which: 3.5 course	28	3.6 academic seminar/laboratory/project	-/28/-
Distribution of time					19hours
Study using the manual, course support, bibliography and handwritten notes					10
Supplementary documentation using the library, on field-related electronic platforms and in field-related places					2
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays					5
Tutorials					-
Examinations					2
Other activities.					-
3.7 Total of hours for individual study	**19**				
3.9 Total of hours per semester	**75**				
3.10 Number of credits	3				

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions) -Electromagnetic field theory, Physics, Mathematics
4.2 related to skills	-Knowledge of electrical symbols, electrical diagrams, use of measuring devices, properties of materials.

5. Conditions (where applicable)

5.1. for the development of the course	The course can be conducted face-to-face or online -Videoprojector, Online Teaching Equipment
5.2.for the development of the academic	Seminar/laboratory/project can be conducted face-to-face or online - Equipment related to the conduct of laboratory hours

seminary/laboratory/project	- Preparation of the report, knowledge of the notions contained in the laboratory work to be carried out (synthesis material); - Performing all the laboratory work.

6. Specific skills acquired	
Professional skills	C1. Performing calculations, demonstrations and applications to solve specific tasks of engineering and management based on knowledge in science fundamental and engineering. C2. Elaboration and interpretation of technical, economic and managerial documentation C5. Technical and technological design of processes regarding structures and systems in the electrical, electronic and energy fields under quality conditions, technical and technological design of processes in the electrical, electronic and energy industries, in given quality conditions.
Transversal skills	

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	▪ The Course of Electrotechnical Materials is designed for the purpose of presenting modern interdisciplinary problems regarding the study of electrical materials. Through the topic addressed, the course is meant to allow students to acquire basic knowledge, in the first stage, about the main phenomena that occur in the study of electrical materials.The course is also intended to facilitate students the development of basic theories and methods of physics, chemistry, suitable for the field of electrical engineering. During the course, the aim is to attract students to discussions on the issues presented so that they have an active participation
7.2 Specific objectives	▪ The laboratory work is designed to provide future engineers in the field of electrical systems. Description of basic concepts, theories and methods of physics, chemistry, suitable for the field of electrical engineering.In the first part of the class time, students are appropriated, by questions, discussions, or tests, of the theoretical notions necessary for laboratory activity, after which, under the supervision of the teacher, the experimental determinations are carried out. During the laboratory class time, discussions are held with the students, who aim to establish the knowledge, and the practical skills of carrying out the assembly schemes, the correct reading of the sizes pursued, and the method of evaluating them.

8. Contents*

8.1 Course	Teaching methods Teaching is done "online", or "face-to-face" according to requirements	No. of hours/ Observations
1.Anorganic and organic chemistry. Chemical bonds..	During teaching, student contributions are requested on course-specific topics. Some courses are conducted by teaching the subjects and debating them by students.	2
2. Crystalline corps. Defects of crystalline networks	Idem	2

3 Energy bands of the electron in crystal	Idem	2
4. Electrical conduction of metals	Idem	2
5. Electrical conduction of semiconductors	Idem	2
6. Electrical polarization	Idem	2
8. Technical and technological properties of electrotechnical materials	Idem	2
9. Conductive materials. Metals	Idem	2
10 Semiconductor materials	Idem	2
11. Gaseous and liquid electro-insulating materials	Idem	2
12. Solid electro-insulating materials	Idem	2
13 Magnetic materials	Idem	2
14. Magnetic liquids	Idem	2

Bibliography

[1]. Claudia Olimpia Staşac, D.A. Hoble – Materials for Electrotechnical and Electronics – University of Oradea Publishing House 2020 ISBN 978-606-10-2092-8
[2]. D.A. Hoble – Materials for Electrical and Electronic Engineering – University of Oradea Publishing House 2013 ISBN 978-606-10-1171-1
[3]. D. Hoble – Electrotechnical Materials – University of Oradea Publishing House 2004 ISBN 973-613-579-9
[4] D. Hoble - Electrotechnical Materials -Laboratory Advisor- U.O.-1998
[5] Rodica Helera – Materiale pentru componente electronice- Ed. MatrixRom Bucureşti 2003
[6] A.Ifrim ş.a. - Materiale electrotehnice E.D.P. - 1982

8.2 Laboratory	Teaching methods	No. of hours/ Observations
1.Work protection rules specific to electrical equipment. Getting the basics of the study of electrical materials.	During the first hour of the laboratory will be presented by the teacher coordinator of the laboratory work of the notions related to the protection of work specific to electrical materials.	2
2. The crystalline structure.	Presentation by students of the report prepared (synthesis material). The laboratory guide is available in printed format within the Laboratory and at the University Library, with students having constant access to teaching materials. - Test on theoretical knowledge related to the laboratory - Performing	2

	experimetal determinations - Interpretation of the results obtained.	
3. Study of volume resistivity.	idem	2
4. Study of surface resistivity	idem	2
5. Study of materials for contacts	idem	2
6. Dynamic study of brushes for electric machines	idem	2
7. Determination of dielectric rigidity in electro-insulating oils	idem	2
8. Determination of dielectric rigidity in solid dielectrics	idem	2
9. Determination of dielectric rigidity in gaseous dielectrics	idem	2
10. Study of viscosity of liquid dielectrics	idem	2
11. Study of Hygroscopicity.	idem	2
12. Determination of the characteristic of varistors.	idem	2
13. Study of the influence of temperature on photovoltaic cells.	idem	2
14 Evaluation of laboratory activity. End of the situation	14 Evaluation Teaching of laboratories and their support; Remaining lab recovery.	2

Bibliography
[1] D.A. Hoble – Applications in the study of electrical materials - University of Oradea Publishing House 2017 ISBN 978-606-10-1879-6
[2]. D. Hoble – Electrotechnical Materials – University of Oradea Publishing House 2004 ISBN 973-613-579-9
[3] D. Hoble - Electrotechnical Materials -Laboratory Advisor- U.O.-1998
[4] Rodica Hella – Electronic Component Materials- Ed. MatrixRom Bucharest 2003
[5] Petre Notingher - Electrotechnical Materials. Uses. Ed. Politahnica Press - 2005

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

- The content of the subject is in accordance with the one in other national or international universities. In order to provide a better accomodation to the labour market requirements, there have been organized meetings both with representatives of the socio-economic environment and with academic staff with similar professional interest fields.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	-- For note 5: all subjects must be treated to minimum standards; -For grades >5 all subjects must be treated proportionally according to the scoring scale.	Written, oral or on-line examination	75 %
10.6 Laboratory	-- All laboratory work must be carried out, which is a condition to enter the exam.	Knowledge assessment test	25 %
10.8 Minimum performance standard: Performing work under the coordination of a teacher, to solve problems specific to the study of electrical equipment and maintenance, maintenance and diagnosis of electrical equipment with the correct			

evaluation of workload, available resources, time of completion and risks, under conditions of application of occupational safety and health rules. After the promotion of the discipline, the student must have the ability to understand the mechanisms of the main phenomena that take place at the level of the structure of electrotechnical materials, their main properties, so that he can choose the right meter in the various practical engineering applications.

Completion date 29.08.2022

Course owner's signature

Lecturer. dr. ing. STAȘAC CLAUDIA OLIMPIA

Signature of the laboratory owner

Lecturer dr. ing. STAȘAC CLAUDIA OLIMPIA

Date of endorsement in the Electrical Engineering department:

01.09.2022

Prof.univ. dr. ing.inf.habil. Hathazi Francisc Ioan

Date of endorsement in the Automated Systems Engineering and Management department**:**

Prof. univ. dr. ing. Helga Silaghi

22.09.2022

Date of endorsement in the Faculty Board:
23.09.2022

Prof.univ.dr.ing.habil. Mircea Gordan

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	Department of Electrical Engineering
1.4 Field of study	Electrical engineering
1.5 Study cycle	Bachelor (1st cycle)
1.6 Study program/Qualification	Electrical Systems / Bachelor of Engineering

2. Datarelated to thesubject

2.1 Name of the subject	ENERGY SOURCES						
2.2 Holder of the subject	Assoc. prof. PANTEA MIRCEA DĂNUȚ						
2.3 Holder of the academic seminar/laboratory/project	Assoc. prof. PANTEA MIRCEA DĂNUȚ						
2.4 Year of study	**4**	2.5 Semester	**7**	2.6 Type of the evaluation	Ex	2.7 Subject regime	Specialized Discipline

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

3.1 Number of hours per week	**4**	of which: 2.2 course		3.3 academic seminar/laboratory/project	**-/2/-**
3.4 Total of hours from the curriculum	**56**	Of which: 3.5 course	**28**	3.6 academic seminar/laboratory/project	**-/28/-**

Distribution of time	44 hours
Study using the manual, course support, bibliography and handwritten notes	14
Supplementary documentation using the library, on field-related electronic platforms and in field-related places	16
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	8
Tutorials	-
Examinations	6
Other activities.	

3.7 Total of hours for individual study	**44**
3.9 Total of hours per semester	**100**
3.10 Number of credits	4

4. Pre-requisites(where applicable)

4.1 related to the curriculum	Basic knowledge of mathematics, physics, chemistry specific to the field of electrical engineering
4.2 related to skills	Extensive knowledge of chemistry and physics, but also of electricity

5. Conditions (where applicable)

5.1. for the development of the course	video projector, laptop, blackboard.
5.2.for the development of the academic seminary/laboratory/project	Mandatory presence at all laboratories;

6. Specific skills acquired	
Professional skills	- C1. Proper implementation of specific fundamental knowledge of mathematics, physics, chemistry, in the field of electrical engineering - C2. Use of fundamental concepts of computer science and information technology - C3. Use of fundamental knowledge of electrotechnics - C4. Design of electrical systems and their components
Transversal skills	

7. The objectives of the discipline(resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	The course "New energy sources" aims to present energy phenomena in terms of applications in technology and is addressed to students in the engineering department, both in electrical engineering. Being a fundamental specialized discipline, its object is to present in a unitary framework, natural phenomena and resources as well as some applications in this field, necessary for knowing how to design and apply them.
7.2 Specific objectives	In addition to the skills offered by the laboratory sessions in the electrical field, they also offer the possibility to evaluate the errors in the experimental determinations performed, but also a better collaboration with colleagues in team work.

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
Course I. Introduction and presentation of objectives	Video projector, slides Interactive blackboard teaching	2
Course II Solar energy		2
Course III Solar cells		
Course IV. Wind energy		2
Course V. Development of wind engineering		2
Course VI. Wind turbines. Basic principles		2
Course VII. The energy of the seas and oceans		2
Course VIII. Geothermal energy		2
Course IX. Geothermal systems		2
Course X. Hydrogen		2
Course XI. Fuel cells		2
Course XII. Thermoelectric conversion		2
Course XIII. Nuclear power		2
Course XIV. The current stage of installation of nuclear power plants		2

Bibliography

1. Mircea Pantea, New sources of renewable energy Volume 1 ISBN: 978-973-759-580-5, ISBN Vol 1. 978-973-759-581-2, 2008
2. Hall D. O., House J., Biomass as a Modern Fuel, ISES World Congress, Budapest, 1993
3. Ursu I., Physics and technology of nuclear materials, RSR Academy Publishing House, Bucharest, 1982
4. Buta A., General energy and energy conversion, “Traian Vuia” Polytechnic Institute of Timişoara, Faculty of Electrical Engineering, 1982
5. Nitu, V., ş. a., General energy and energy conversion, Didactic and Pedagogical Publishing House, Bucharest, 1980
6. Tomescu F. M., Energy conversion and sources, Bucharest Polytechnic Institute, 1975

8.2 Laboratory	Teaching methods	No. of hours/ Observations

1. Speed regulation and tracing of operating characteristics (both current - voltage and current - resistance) to 6 12 V motors powered by a 1.5 W solar panel, and filtering the supply voltage	Laboratory presentation	4
2. Light-dependent resistance	Based on the report prepared by the students, after a discussion with the teacher on the paper, we proceed to identify the stand, the components necessary for the work, after which the students make the assembly of the practical part of the paper and only together with the teacher make inexhaustible determinations. At the end, the results obtained face to face are interpreted	4
3. Photodiode		6
4. The phototransistor		4
5. Heating of domestic hot water with the help of solar panels from the laboratory equipment.		2
6. Materials available for LED devices		4
7. Conversion of wind energy into electricity. Valslr PP-H HTM.DN 110. EN1451	Students take tests from all laboratory work.	4

Bibliography

1. Mircea Pantea, New sources of renewable energy Volume 1 ISBN: 978-973-759-580-5, ISBN Vol 1. 978-973-759-581-2, 2008
2. Buta A., General energy and energy conversion, "Traian Vuia" Polytechnic Institute of Timişoara, Faculty of Electrical Engineering, 1982
3. Tomescu F. M., Energy Conversion and Sources, Bucharest Polytechnic Institute, 1975
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9. http://www.lpelectric.ro/en/index_en.html
10. www.panosolare.com
11. www.naturenergy.ro
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13. http://re.jrc.ec.europa.eu/pvgis/apps3/pvest.php

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

The content of the discipline is adapted and satisfies the requirements imposed on the labor market, being agreed by the social partners, professional associations and employers in the field related to the bachelor program. The content of the discipline is found in the curriculum of the ELECTROMECHANICS specialization and from other university centers in Romania that have accredited this specialization, so the knowledge of the basic notions is a stringent requirement of the employers in the field.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	-	Written examination	70 %
10.6 Laboratory	-	Knowledge assessment test	30 %
10.8 Minimum performance standard: offers the formation of skills in the energy field and highlights both the phenomena and methods of conversion of solar, wind, nuclear, geothermal, etc. a. in electricity.			

	Signature of the course holder	Signature of the laboratory project holder
Completion date: 29.08.2022	Ş.l.dr.ing. Pantea Mircea mirceadanutpantea@gmail.com	Ş.l.dr.ing. Pantea Mircea
Date of endorsement in the department: 01.09.2022	Signature of the department director Prof.univ.dr.ing.inf. Francisc - Ioan HATHAZI francisc.hathazi@gmail.com Signature of the Dean Prof.univ.dr.ing. Mircea Ioan GORDAN mgordan@uoradea.ro	
Date of endorsement in the Faculty Board: 23.09.2022	Signature of the Dean Prof.univ.dr.ing. Mircea Ioan GORDAN mgordan@uoradea.ro	

SUBJECT DESCRIPTION

1. Data related to the study program

1.1 Higher education institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**Faculty of Electrical Engineering and Information Technology**
1.3 Department	DEPARTMENT OF ELECTRICAL ENGINEERING
1.4 Field of study	ELECTRICAL ENGINEERING
1.5 Study cycle	Bachelor (1st cycle)
1.6 Study program/Qualification	Economic engineering on electrical, electronic and energy Bachelor of Engineering

2. Data related to the subject

2.1 Name of the subject		**ELECTROTHERMICS**					
2.2 Holder of the subject		**Conf.dr.ing. BANDICI LIVIA**					
2.3 Holder of the academic seminar / laboratory / project		**Şef.lucr.dr.ing. GAL TEOFIL – Laboratory**					
2.4 Year of study	IV	2.5 Semester	7	2.6 Type of the evaluation	Ex	2.7 Subject regime	DS

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

3.1 Number of hours per week	3	of which: 3.2 course	2	3.3 academic seminar/laboratory/project	1
3.4 Total of hours from the curriculum	42	Of which: 3.5 course	28	3.6 academic seminar/laboratory/project	14

Distribution of time	hours
Study using the manual, course support, bibliography and handwritten notes	5
Supplementary documentation using the library, on field-related electronic platforms and in field-related places	5
Preparing academic seminaries/laboratories/ themes/ reports/ portfolios and essays	-
Tutorials	1
Examinations	3
Other activities.	-

3.7 Total of hours for individual study	**14**
3.9 Total of hours per semester	**56**
3.10 Number of credits	2

4. Pre-requisites (where applicable)

4.1 related to the curriculum	(Conditions)
4.2 related to skills	

5. Conditions (where applicable)

5.1. for the development of the course	- Video projector, computer; - The course can be held face to face or online; - Attendance: at least 50% of the courses.
5.2.for the development of the academic seminary/laboratory/project	- The laboratory can be held face to face or online; - The equipment related to the laboratory class; - Preparation of the report (synthesis material);

	- Carrying out all laboratory works; - The recovery of one missed laboratory is allowed; - Attendance at laboratory classes: less than 70% leads to the restoration of the discipline.
6. Specific skills acquired	
Professional skills	**C.3. Appropriate application of energy conversion knowledge, electromagnetic and mechanical phenomena specific to static, electromechanical converters, electrical equipments and electromechanical drives**

7. The objectives of the discipline (resulting from the grid of the specific competences acquired)

7.1 The general objective of the subject	The course "Electrothermics" aims to familiarize students with the study and utility of electrothermal equipment. Being a specialized discipline, its object is to present in a uniform framework the electrothermal equipment for the conversion of electric energy into heat, especially those specific to the industrial field. Students have the opportunity to familiarize themselves with various electrothermal installations, to acquire practical skills regarding the building, sizing and operating of electrothermal installations, with the possibility to execute, maintain, exploit and repair them.
7.2 Specific objectives	The laboratory is designed to provide future electromechanical engineers with practical skills in designing, building, researching, operating, repairing and maintaining electrothermal installations. The contents of the presented laboratory works are based on the need to deepen the problems presented in the course. Students have the possibility of identifying electrical circuits for electrothermal installations, to familiarize themselves with modern means of temperature measurement, of electrical parameters during electrothermal processes. They will understand the complexity and usefulness of these facilities and treat them as such. Knowledge is useful in forming skills to address specific issues faced by a specialist in the field of electromechanics.

8. Contents*

8.1 Course	Teaching methods	No. of hours/ Observations
I. General problems with electrothermal installations	Projector. Intercalated student contributions are requested on subject-specific topics. Platforma e-learning a University of Oradea (https://e.uoradea.ro). Some courses take place by teaching subjects and student debates.	2
II. Materials used in the construction of electrothermal equipment 2.1. Refractory materials 2.2. Heat insulating materials 2.3. Resistive materials 2.4. Materials for electrodes of electric arc furnaces **III. Heat transfer in electrothermal equipment** 3.1. Thermal conduction. 3.2. Thermal convection. 3.3. Thermal radiation. 3.4. Means for measuring temperature	Idem	2
IV. Electrical heating heaters 4.1. Classification of heating systems with electrical resistance 4.2. Heaters	Idem	2

4.3. Main features of electrical resistance heating systems 4.3.1. Constitutive elements 4.4.1. Discontinuous direct-heating systems. 4.4.2. Continuous direct-heating systems		
4.4.3. Direct heating ovens 4.4.3.1. Furnaces for grafting and for production of carborundum 4.4.3.2. Glass melting furnaces 4.4.3.3. Furnaces for the extraction and refining of aluminum 4.4.3.4. Installations for direct water heating	Idem	2
4.5. Installations with electrical resistance with indirect heating 4.6. Laboratory electric furnaces	Idem	2
4.7. Home appliances 4.8. Infrared heating	Idem	2
V. Electric arc furnaces 5.1. Classification and areas of use 5.2. The electric arc 5.3. Electric arc furnaces with direct action for steel melting	Idem	2
5.4. Electric arc furnaces power at continuous voltage 5.5. Electric arc and resistance furnaces. 5.6. Vacuum melting electric arc furnaces 5.7. Flow layer melting furnaces 5.8. Plasma heating installations	Idem	2
VI. Electromagnetic induction heating 6.1. The principle of heating by electromagnetic induction 6.2. The penetration of the electromagnetic field and the power transmitted to the piece. The influence of material characteristics on penetration depth	Idem	2
6.3. Electrical parameters of the inductor-body system 6.4. Energy indicators of electromagnetic induction heating 6.5. Electrical equipment for electromagnetic induction heating	Idem	2
6.6. Applications of electromagnetic induction heating 6.6.1. Melting pot induction furnaces for metals 6.6.2. Channel induction furnace for melting metals	Idem	2
6.6.3. Deep heating by electromagnetic induction 6.6.4. Cross-flow heating 6.6.5. Surfacing 6.6.6. Special applications of induction heating	Idem	2
VII. Heating of dielectric materials 7.1. General notions on dielectric heating	Idem	2
7.2. Capacitive heating	Idem	2

Bibliography

[1]. Livia Bandici. *Electrotermie. Teorie şi aplicaţii.* Editura Universităţii din Oradea, 2016.
[2]. Livia Bandici, *Electrotermie*. Editura Universităţii din Oradea, 2004.
[3]. Livia Bandici, D. Hoble. *Electrotermie. Îndrumător de laborator*. Editura Universităţii din Oradea, 2000.
[4]. Livia Bandici, *Electrotermie – Aplicaţii*. Editura Universităţii din Oradea, 2003.
[5]. D. Comşa, *Instalaţii electrotermice industriale*. Editura Tehnică Bucureşti, 1986.
[6]. N. Golovanov, I. Şora, ş.a. – *Electrotermie şi Electrotehnologii*. Vol. I. Editura Tehnică, Bucureşti, 1997
[7]. A.E. Sluhoţki, S.E. Râşkin – *Inductoare pentru încălzirea electrică*. Editura Tehnică Bucureşti, 1983.
[8]. V. Firețeanu, *Electrotermie*. Culegere de aplicaţii. Editura Politehnică Bucureşti, 1991
[9]. V. Firețeanu, *Procesarea electromagnetică a materialelor*. Editura Politehnică Bucureşti, 1995.
[10]. Şora, V.Conta, D.Popovici, *Utilizări ale energiei electrice*. Editura Facla, 1983.
[11]. M. Ungureanu, M. Chindriş, I. Lungu, *Utilizări ale energiei electrice.* Editura Didactică şi Pedagogică Bucureşti, 1999.

8.2 Laboratory	Teaching methods	No. of hours/ Observations
1. Work safety standards specific to electrothermal installations. Transmission of heat. Theoretical Applications.	In the first hour of the laboratory, the coordinating teacher will present the laboratory works, the notions related to work	2

	safety, specific to electrothermal installations. In the second part of the laboratory, a theoretical application on the transmission of heat will be made.	
2. Means of temperature measurement. Experimental determinations. Study of the instantaneous water heating system. Experimental determinations.	Presentation of the written report (synthesis material) by the students; Test on the theoretical knowledge aquired during the laboratory. Interpretation of the results.	2
3. Study on the resistor furnace with indirect heating used for heat treatments. Experimental determinations.	Idem	2
4. Study on the infrared heating installation. Experimental determinations.	Idem	2
5. Study on the channel induction furnace. Experimental determinations.	Idem	2
6. Study on the induction heating installation for surface hardening of metals. Experimental determinations.	Idem	2
7. Assessment of the knowledge acquired during the laboratory classes.	- presenting and handing out the laboratory papers; - the recovery of one missed laboratory is allowed.	2

Bibliography

[1]. Livia Bandici, D. Hoble. *Electrotermie. Studii teoretice şi aplicative.* Editura Universităţii din Oradea, 2009.
[2]. Livia Bandici, *Electrotermie*. Editura Universităţii din Oradea, 2004.
[3]. Livia Bandici, D. Hoble. *Electrotermie. Îndrumător de laborator*. Editura Universităţii din Oradea, 2000.
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[5]. D. Comşa, *Instalaţii electrotermice industriale*. Editura Tehnică Bucureşti, 1986.
[6]. N. Golovanov, I. Șora, ș.a. – *Electrotermie şi Electrotehnologii*. Vol. I. Editura Tehnică, Bucureşti, 1997.

9. Corroboration of the discipline content with the expectations of the representatives of epistemological community, professional associations and representative employers in the field related to the program

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10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percent from the final mark
10.4 Course	Minimum required conditions for passing the exam (mark 5): in accordance with the minimum performance standard For grades> 5 all subjects must be treated to maximum standards		

10.5 Laboratory	Minimum required conditions for promotion (grade 5): in accordance with the minimum performance standard		
10.6 Minimum performance standard: Design of components of a low complexity electrical system. Solving problems specific to electrothermal installations, with the correct evaluation of the workload, of the available resources, of the necessary completion time and of the risks, in conditions of application of the norms of safety and health at work. Principle of operation and composition of electrothermal installations.			

Completion date:
29.08.2022

Date of endorsement in the department:
01.09.2022

Date of endorsement in the Faculty Board:

23.09.2022