COURSE OUTLINE

1. Data about the study programme

1.1 Higher education institution	**Transilvania University of Brașov**
1.2 Faculty	Silviculture and Forest Engineering
1.3 Department	Interdisciplinary Doctoral School
1.4 Field of study[1)]	PhD
1.5 Study level[2)]	PhD
1.6 Study programme/ Qualification	Engineering Sciences

2. Data about the course

2.1 Name of course			Dissemination of Research Results					
2.2 Course convenor			Prof. Dr. Alexandru Lucian Curtu					
2.3 Seminar/ laboratory/ project convenor			Prof. Dr. Alexandru Lucian Curtu					
2.4 Study year	I	2.5 Semester	I	2.6 Evaluation type	E	2.7 Course status	Content[3)]	SC
							Attendance type[4)]	CPC

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

3.1 Number of hours per week	2	out of which: 3.2 lecture	1	3.3 seminar/ laboratory/ project	1
3.4 Total number of hours in the curriculum	12	out of which: 3.5 lecture	6	3.6 seminar/ laboratory/ project	6

Time allocation	hours
Study of textbooks, course support, bibliography and notes	40
Additional documentation in libraries, specialized electronic platforms, and field research	56
Preparation of seminars/ laboratories/ projects, homework, papers, portfolios, and essays	34
Tutorial	4
Examinations	2
Other activities	2

3.7 Total number of individual study hours	138
3.8 Total number per semester	150
3.9 Number of credits[5)]	5

4. Prerequisites (if applicable)

4.1 curriculum-related	•
4.2 competences-related	•

5. Conditions (if applicable)

5.1 for course development	• Standard lecture room
5.2 for seminar/ laboratory/ project development	• Standard seminar room

6. Specific competences

Professional competences	• Understand how to structure information and how to write scientific articles • Apply principles of effective public communication in presenting research results
Transversal competences	• Develop and employ critical thinking skills in analysing and evaluating scientific information • Manage time resources efficiently to meet academic and professional objectives

7. Course objectives (resulting from the specific competences to be acquired)

7.1 General course objective	• To develop their skills in disseminating the results of their doctoral research in written texts (scientific articles) and via oral presentations
7.2 Specific objectives	• To develop their skills in article writing • To develop their skills in presenting their research results

8. Content

8.1 Lecture	Teaching methods	No. of hours	Remarks
Guidelines for writing research articles. Article sections: overview, content, order of creation	interactive	4	
Aspects of oral communication in research: conference presentations (from planning to delivery)	interactive	2	
Bibliography Bates College (2004-2017) Department of Biology, How to Write a Paper in Scientific Journal Style and Format, http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWtoc.html. Curtu AL (2025) Lecture notes (available on the e-learning platform). Elzinga C *Guidelines for Writing Scientific Papers, 185-192,* https://msu.edu/course/lbs/158h/manual/paper.pdf. Harley CD, Hixon MA, Levin LA (2004) Scientific writing and publishing - a guide for students. *Bulletin of the Ecological Society of America* **78**. Norris, C.B. 2022, Academic Writing in English, University of Helsinki			
8.2 Seminar/ laboratory/ project	Teaching-learning methods	No. of hours	Remarks
Presentation on Background to the study, Research objectives and Plan for dissemination	discussion	6	
Bibliography Bates College (2004-2017) Department of Biology, How to Write a Paper in Scientific Journal Style and Format, http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWtoc.html Curtu AL (2025) Instructions for the assignment (available on the e-learning platform) Elzinga C *Guidelines for Writing Scientific Papers, 185-192,* https://msu.edu/course/lbs/158h/manual/paper.pdf. Harley CD, Hixon MA, Levin LA (2004) Scientific writing and publishing - a guide for students. *Bulletin of the Ecological Society of America* **78**. Norris, C.B. 2022, Academic Writing in English, University of Helsinki			

9. Correlation of course content with the demands of the labour market (epistemic communities, professional associations, potential employers)

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of the final grade
10.4 Lecture	Video file on the e-learning platform	Incorporation of the feedback received during seminar	50%
10.5 Seminar/ laboratory/ project	Presentation during seminar	Structure, content and delivery of the presentation	50%
10.6 Minimal performance standard			
• Presentation of the Background to the study, Research objectives and Plan for dissemination			

This Course Outline was approved by the Council of the Interdisciplinary Doctoral School (SDI) on 18 November 2025 and approved by the Council for Doctoral Studies (CSUD) on 19 November 2025.

Prof. Dr. Eng. Cătălin ALEXANDRU Director of CSUD	Prof. dr. Mona Brigitte ARHIRE Director of SDI
Prof. Dr. Alexandru Lucian CURTU Lecture convenor	Prof. Dr. Prof. Dr. Alexandru Lucian CURTU Seminar/ laboratory/ project convenor

Note:

1) Field of study – select one of the following options: BA/MA/PhD. (to be filled in according to the forceful classification list for study programmes);

2) Study level – choose from among: BA/MA/PhD.;

3) Course status (content) – for the BA level, select one of the following options: FC (fundamental course) / DC (course in the study domain)/ SC (speciality course)/ CC (complementary course); for the MA level, select one of the following options: PC (proficiency course)/ SC (synthesis course)/ AC (advanced course)

4) Course status (attendance type) – select one of the following options: CPC (compulsory course)/ EC (elective course)/ NCPC (non-compulsory course);

5) One credit is the equivalent of 25 – 30 study hours (teaching activities and individual study).

COURSE OUTLINE

1. Data about the study programme

1.1 Higher education institution	Transilvania University of Brașov
1.2 Faculty	
1.3 Department	Interdisciplinary Doctoral School
1.4 Field of study[1)]	
1.5 Study level[2)]	PhD
1.6 Study programme/ Qualification	

2. Data about the course

2.1 Name of course			Acquisition and Processing of Experimental Data					
2.2 Course convenor			Assoc. Prof. Dr. Marius VOLMER					
2.3 Seminar/ laboratory/ project convenor			Assoc. Prof. Dr. Marius VOLMER					
2.4 Study year	I	2.5 Semester	I	2.6 Evaluation type	E1	2.7 Course status	Content[3)]	DC
							Attendance type[4)]	EC

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

3.1 Number of hours per week	2	out of which: 3.2 lecture	1	3.3 seminar/ laboratory/ project	1
3.4 Total number of hours in the curriculum	12	out of which: 3.5 lecture	6	3.6 seminar/ laboratory/ project	6

Time allocation	hours
Study of textbooks, course support, bibliography and notes	40
Additional documentation in libraries, specialized electronic platforms, and field research	45
Preparation of seminars/ laboratories/ projects, homework, papers, portfolios, and essays	28
Tutorial	2
Examinations	4
Other activities	

3.7 Total number of individual study hours	119
3.8 Total number per semester	125
3.9 Number of credits[5)]	5

4. Prerequisites (if applicable)

4.1 curriculum-related	• -
4.2 competences-related	• -

5. Conditions (if applicable)

5.1 for course development	• Classroom with video projector and internet connection
5.2 for seminar/ laboratory/ project development	• Classroom with video projector and internet connection

6. Specific competences

Professional competences	• Appropriate application of acquired knowledge for the design and implementation of scientific experiments necessary for doctoral training. • Applying the knowledge acquired in the process of writing scientific reports/articles
Transversal competences	• Performing complex professional tasks under conditions of autonomy and professional independence • Learning teamwork and cooperation within epistemic networks

7. Course objectives (resulting from the specific competences to be acquired)

7.1 General course objective	• To familiarize the PhD student with modern data acquisition systems and processing methods.
7.2 Specific objectives	• Understanding the structure of a measurement chain adapted to research activity • Ensuring the ability to process and correctly interpret numerical data obtained from experiments within doctoral research

8. Content

8.1 Lecture	Teaching methods	No. of hours	Remarks
Acquisition and Processing of Experimental Data – Introductory aspects and motivation. Scientific method - body of techniques for investigating phenomena, acquiring new knowledge, and others. Examples. Experiment and measurement - selection of proper methods, instrumentation and consideration of experimental uncertainties. Examples of data acquisition for different types of physical quantities.	Interactive teaching materials, presented with video projector.	3	Teaching centered on PhD students with examples and practical applications
Experimental data processing. Experimental Errors and Uncertainties; Graphical representation of experimental data; Practical examples. Noise reduction methods. Hardware noise reduction, data averaging and digital signal processing (DSP). Fast Fourier Transform utilized for signal processing and noise reduction. Examples.	Interactive teaching materials, presented with video projector.	3	Teaching centered on PhD students with examples and practical applications

Bibliography

1. Marius Volmer, Course support on e-learning platform
2. Data Acquisition Handbook; A Reference For DAQ and Analog & Digital Signal Conditioning, 2004-2012 by Measurement Computing Corporation; http://www.mccdaq.com/pdfs/anpdf/data-acquisition-handbook.pdf
3. https://physweb.bgu.ac.il/COURSES/SignalNoise/data_aquisition_fundamental.pdf
4. http://courses.me.metu.edu.tr/courses/me410/tb/ME410-Week12.pdf

5. Web resources https://www.sigview.com/; https://sourceforge.net/projects/scidavis/			
8.2 Seminar/ laboratory/ project	Teaching-learning methods	No. of hours	Remarks
Selection of the experimental setup according to studying phenomena; presentation of some practical examples.	Interactive teaching materials and live presentations	2	Teaching centered on PhD students with examples and practical applications
Advanced methods of processing and graphical representation of experimental data – examples.	Interactive teaching, practical activities under the guidance of the teacher.	2	Teaching centered on PhD students with examples and practical applications
Identifying of project themes to be prepared.	Interactive teaching and debates on this subject.	2	Teaching centered on PhD students.
Bibliography 1 Resursa web. https://www.originlab.com/doc/User-Guide 2. Resure web https://www.sigview.com/; https://sourceforge.net/projects/scidavis/ 3. Marius Volmer, Documentation support on e-learning platform			

9. Correlation of course content with the demands of the labour market (epistemic communities, professional associations, potential employers)

The course provides the knowledge necessary to implement modern methods of investigation, acquisition and analysis of data in research activity.

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of the final grade
10.4 Lecture	Active involvement of the doctoral student through discussions based on the topics presented.	Ongoing evaluation	15 %
10.5 Seminar/ laboratory/ project	Active involvement of the PhD student during seminar classes.	Ongoing evaluation.	15 %
	Developing a project based on the topic addressed.	Examination based on presented project	70 %
10.6 Minimal performance standard			
• Mastery of the basic elementary notions of the discipline demonstrated through the projects presented.			

This Course Outline was approved by the Council of the Interdisciplinary Doctoral School (SDI) on 18 November 2025 and approved by the Council for Doctoral Studies (CSUD) on 19 November 2025.

Prof. Dr. Eng. Cătălin ALEXANDRU Director of CSUD	Prof. dr. Mona Brigitte ARHIRE Director of SDI

Assoc. Prof. Dr. Marius VOLMER Lecture convenor	Assoc. Prof. Dr. Marius VOLMER Seminar/ laboratory/ project convenor

Note:

1) Field of study – select one of the following options: BA/MA/PhD. (to be filled in according to the forceful classification list for study programmes);

2) Study level – choose from among: BA/MA/PhD.;

3) Course status (content) – for the BA level, select one of the following options: FC (fundamental course) / DC (course in the study domain)/ SC (speciality course)/ CC (complementary course); for the MA level, select one of the following options: PC (proficiency course)/ SC (synthesis course)/ AC (advanced course)

4) Course status (attendance type) – select one of the following options: CPC (compulsory course)/ EC (elective course)/ NCPC (non-compulsory course);

5) One credit is the equivalent of 25 – 30 study hours (teaching activities and individual study).

FIŞA DISCIPLINEI

1. Date despre program

1.1 Instituţia de învăţă superior	Universitatea Transilvania din Braşov
1.2 Facultatea	
1.3 Departamentul	Şcoala Doctorală Interdisciplinară
1.4 Domeniul de studii de doctorat[1)]	Ştiinţe inginereşti
1.5 Ciclul de studii[2]	DOCTORAT
1.6 Programul de studii/ Calificarea	Inginerie mecanică, Inginerie industrială, Inginerie electrică, Calculatoare şi tehnologia informaţiei, Inginerie electronică, telecomunicaţii şi tehnologii informaţionale, Ingineria materialelor, Ingineria sistemelor, Inginerie şi management, Silvicultură, Inginerie forestieră

2. Date despre disciplină

2.1 Denumirea disciplinei	Creativitate şi Inventică							
2.2 Titularul activităţilor de curs				Prof. dr. ing. Şerban BOBANCU				
2.3 Titularul activităţilor de seminar/ laborator/ proiect				Prof. dr. ing. Şerban BOBANCU				
2.4 Anul de studiu	1	2.5 Semestrul	1	2.6 Tipul de evaluare	E	2.7 Regimul disciplinei	Conţinut[3)]	DCA
							Obligativitate[3)]	DO

3. Timpul total estimat (ore pe semestru al activităţilor didactice)

3.1 Număr de ore pe săptămână (6 săptămâni)	2	din care: 3.2 curs	1	3.3 seminar/ laborator / proiect	1
3.4 Total ore din planul de învăţământ	12	din care: 3.5 curs	6	3.6 seminar/ laborator/ proiect	6

Distribuţia fondului de timp	ore
Studiul după manual, suport de curs, bibliografie şi notiţe	38
Documentare suplimentară în bibliotecă, pe platformele electronice de specialitate şi pe teren	36
Pregătire seminare/ laboratoare/ proiecte, teme, referate, portofolii şi eseuri	35
Tutoriat	2
Examinări	2
Alte activităţi.....	

3.7 Total ore de activitate a studentului	113
3.8 Total ore pe semestru	125
3.9 Numărul de credite[5)]	5

4. Precondiţii (acolo unde este cazul)

4.1 de curriculum	• Cursant în cadrul Şcolii Doctorale
4.2 de competenţe	•

5. Condiţii (acolo unde este cazul)

5.1 de desfăşurare a cursului	• Acces INTERNET + videoproiector
5.2 de desfăşurare a seminarului/ laboratorului/ proiectului	• Acces INTERNET + videoproiector

6. Competenţe specifice acumulate

Competenţe profesionale	• Creşterea propriei potenţe creative • Înţelegerea procedurilor care duc la cel mai mare randament in activitatea de conceptie • Însuşirea unor tehnici specifice activităţilor creative • Aplicarea acelor tehnici care se potrivesc cel mai bine cursantului şi domeniului de specializare prin doctorat • Însuşirea deprinderilor specifice expunerii propriilor creaţii tehnice in fata unui auditoriu de specialitate
Competenţe transversale	• Corelarea rigorilor propriului domeniu de specializare cu tehnici generale de creativitate

7. Obiectivele disciplinei (reieşind din competenţele specifice acumulate)

7.1 Obiectivul general al disciplinei	• Dezvoltarea capacităţilor creative a propriei persoane. Efectuarea unor teste specifice. Dezvoltarea aptitudinilor şi însuşirea unor tehnici de creativitate în grup. • Înţelegerea şi punerea în practică (prin intermediul unui referat) a metodologiilor de concepţie inovativă, utilizând tehnici individuale şi de grup. • Însuşirea noţiunilor de proprietate intelectuală. Însuşirea metodologilor pentru brevetarea invenţiilor în România şi străinătate. • Propunerea de către fiecare cursant a unor inovaţii sau potenţiale invenţii.
7.2 Obiectivele specifice	• Publicarea unei lucrari cu conţinut inovativ într-o revistă de specialitate

8. Conţinuturi

8.1 Curs	Metode de predare	Nr. ore	Obs.
1. Dezvoltarea propriei potenţe creative. Concepte psihanalitice privind activitatea mentală. Principiile lui FREUD şi ADLER. Dezvoltările practice ale lui YOUNG. Somnul, activitatea mentală şi actul creativ. Relaţia somn paradoxal REM-memorie. Modalităţi practice de direcţionare a inconştientului în activitatea creatoare. Corelaţia activităţii onirice cu cea creativă. Metode de utilizare a inconştientului la rezolvarea novatoare a unei probleme. Antrenamentul creativităţii proprii.	Prelegere, conversatie euristică	2	
2. Tehnica BRAINSTORMING (cascada ideilor). Principiile metodei. Modalitatea practică a organizării şi funcţionării grupului creativ. Check-listă pentru ieşirea din impas. Tehnica analizei morfologice. Prospectarea câmpurilor de decizie independente - PINDAR. Tehnica DELPHY.	Prelegere, conversatie euristică	2	
3. Obstacole în cale gândirii creatoare .Teste pentru educarea şi dezvoltarea potenţei creative a propriei persoane. Analiza multi-criterială avansată	Prelegere, conversatie euristică	1	
4. Noţiuni de proprietate intelectuală. Creaţii intelectuale industriale. Invenţia. Inovaţia. Know-how. Desene şi modele industriale etc. Semne distinctive. Mărcile de fabrică, de	Prelegere, conversatie euristică	1	

comerț și de serviciu. Alte semne distinctive. Dreptul de autor și drepturi conexe dreptului de autor.Brevetarea invențiilor.			

Bibliografie

1. ADAMS, J.L. *Conceptual blockbusting.A guide to better Ideas*, 2001. Basic books. Perseus Publishing, Cambridge Center, New York.
2. BOBANCU, Ş., *Creativitate şi Inventică*, Curs, Ediţia a X-a, 2015, www.unitbv.ro.
3. BOBANCU, Ş., COZMA, R., LIXĂNDROIU, D., FOIŞOREANU, V., *Tehnici de creativitate*, Editura Lux Libris, Braşov, 1998. Cota Bibliotecii: CAT 084.
4. BOBANCU, Ş., COZMA, R., *Tehnici de Inovare-Inventică pentru utilizări practice*, Curs universitar, Universitatea din Braşov, 1997. Cota Bibliotecii: III 14364.

8.2 Seminar/ laborator/ proiect	Metode de predare-învățare	Număr de ore	Observații
Sunt seminarizate cunoştinţele de bază din capitolele cursului. Se urmăreşte însuşirea şi aplicarea efectivă a unor tehnici de creaţie individuale şi de grup. Se face o cercetare bibliografică, respectiv un studiu de nivel pentru un referat specific. Tematica referatului va fi, dacă e posibil, din domeniul tezei de doctorat sau dacă nu, din alt domeniu de interes pentru cursant şi conducătorul de doctorat (cu care, doctorandul trebuie să se consulte în prealabil).	Discutii interactive	6	
Bibliografie. Aceeaşi cu cea de la curs.			

9. Coroborarea conținuturilor disciplinei cu așteptările reprezentanților comunităților epistemice, ale asociaților profesionale și ale angajatorilor reprezentativi din domeniul aferent programului

Competențele specifice acumulate înlesnesc rezolvarea inovativa a unor teme/probleme ale mediului industrial.	

10. Evaluare

Tip de activitate	10.1 Criterii de evaluare	10.2 Metode de evaluare	10.3 Pondere din nota finală
10.4 Curs	Aprecierea gradului de însuşire a tehnicilor de creativitate	Examen scris	20%
	Analiza opiniilor proprii ale cursantului		
10.5 Seminar/ laborator/ proiect	Respectarea cerinţelor impuse şi aprecierea gradului de creativitate	Referat întocmit în activitatea de studiu individual	80%
10.6 Standard minim de performanţă			

Prezenta Fişă de disciplină a fost avizată în şedinţa de ConsiliuL SDI din data de ...18.11.2025..... şi aprobată de CSUD în data de ....19.11.2025.....

Prof. dr. ing. Catalin ALEXANDRU
Director CSUD

Prof. dr. Mona Brigitte ARHIRE
Director SDI

Prof. dr. ing. Şerban BOBANCU
Titular de curs

Prof. dr. ing. Şerban BOBANCU
Titular de seminar/ laborator/ proiect

Notă:

1) Domeniul de studii - se alege una din variantele: Licenţă/ Masterat/ Doctorat (se completează conform cu Nomenclatorul domeniilor şi al specializărilor/ programelor de studii universitare în vigoare);

2) Ciclul de studii - se alege una din variantele: Licenţă/ Masterat/ Doctorat;

3) Regimul disciplinei (conţinut) - se alege una din variantele: DF (disciplină fundamentală)/ DD (disciplină din domeniu)/ DS (disciplină de specialitate)/ DC (disciplină complementară) - pentru nivelul de licenţă; DAP (disciplină de aprofundare)/ DSI (disciplină de sinteză)/ DCA (disciplină de cunoaştere avansată) - pentru nivelul de masterat;

4) Regimul disciplinei (obligativitate) - se alege una din variantele: DI (disciplină obligatorie)/ DO (disciplină opţională)/ DFac (disciplină facultativă);

COURSE OUTLINE

1. Data about the study programme

1.1 Higher education institution	Transilvania University of Brașov
1.2 Faculty	
1.3 Department	Interdisciplinary Doctoral School
1.4 Field of study[1)]	Mechanical Engineering, Industrial Engineering, Electrical Engineering, Comput and Information Technology, Electronic Engineering, Telecommunications and Information Technologies, Materials Engineering, Systems Engineering, Engineering and Management, Silviculture, Forest Engineering, Mathematics, Informatics, Marketing, Sports and Physical Education, Medicine
1.5 Study level[2)]	Doctoral
1.6 Study programme/ Qualification	Mechanical Engineering, Industrial Engineering, Electrical Engineering, Comput and Information Technology, Electronic Engineering, Telecommunications and Information Technologies, Materials Engineering, Systems Engineering, Engineering and Management, Silviculture, Forest Engineering, Mathematics, Informatics, Marketing, Sports and Physical Education, Medicine

2. Data about the course

2.1 Name of course				ENGLISH LANGUAGE IN SCIENCE (ELS-N1, beginners)				
2.2 Course convenor				Prof. Marinela Burada				
2.3 Seminar				Prof. Marinela Burada				
2.4 Study year	I	2.5 Semester	I	2.6 Evaluation type	E	2.7 Course status	Content[3)]	DC
							Attendance type[4)]	DI

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

3.1 Number of hours per week	2	out of which: 3.2 lecture	1	3.3 seminar/ laboratory/ project	1
3.4 Total number of hours in the curriculum	12	out of which: 3.5 lecture	6	3.6 seminar/ laboratory/ project	6

Time allocation	hours
Study of textbooks, course support, bibliography and notes	40
Additional documentation in libraries, specialized electronic platforms, and field research	40
Preparation of seminars/ laboratories/ projects, homework, papers, portfolios, and essays	28
Tutorial	2
Examinations	3
Other activities.....	=

3.7 Total number of hours of student activity	113
3.8 Total number per semester	125
3.9 Number of credits[5)]	5

4. Prerequisites (if applicable)

4.1 curriculum-related	• N/a
4.2 competences-related	• N/a

5. Conditions (if applicable)

5.1 for course development	• multimedia teaching space, internet connection

5.2 for seminar	• multimedia teaching space, internet connection

6. Specific competences and learning outcomes

Professional competences	The students in this group will acquire a basic level of EL competence that lays the foundation for further competence development.
Transversal competence	The students will develop their professional communication skills via teamwork.

7. Course objectives (resulting from the specific competences to be acquired)

7.1 General course objective	Developing basic language abilities. Introducing the basics of EL grammar with a focus on those L1 – L2 discrepancies that cause interference and error.
7.2 Specific objectives	Developing the language used to describe people and objects and to formulate Q & As. Developing a reticulated view of the distinctions afforded by the use of aspect i.e., progressive vs. non-progressive aspect. Developing the language used to express possession and numbers.

8. Content

8.1 Course	Teaching methods	Number of hours	Remarks
Primary Auxiliaries: be, have, do. Present Simple: affirmatives, interogatives, negatives.	Lecturing	2	Interactive approach
Present vs. Present progressive		2	
Possessives and numbers		2	
Selected bibliography Bibliografie 1.Downing, Angela & Locke, Philip (2006) English Grammar. A University Course. London and New York: Routledge 2.Greenbaum, S.& Quirk, R. (1990) A Student's Grammar of the English Language. Longman 3.Huddleston, Rodney & Pullum, Geoffrey K. (2002, 2006) The Cambridge Grammar of the English Language. Cambridge: CUP 4.Quirk, R.,Greenbaum, S., Leech, G. & Svartvik, J. (1985) A Comprehensive Grammar of the English Language. Longman			
8.2 Seminar	drilling, communicative method	Number of hours	Remarks
Describing objectsand spetial relations		2	Interactive approach
Possessive pronouns in context		2	
Numbers from 1 to 100		2	
Selected bibliography 1. Downing, Angela & Locke, Philip (2006) English Grammar. A University Course. London and New York: Routledge 2. Jackson, Howard (2002) Grammar and Vocabulary. A resource book for students. London and New York: Routledge 3. Jacobs, A. Roderick (1995) English Syntax. A Grammar for English Language Professionals. Oxford University Press			

9. Correlation of course content with the demands of the labour market (epistemic communities, professional associations, potential employers in the field of study)

Students will be able to convey/understand simple messages in English

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of the final grade
10.4 Course	Level of acquisition and understanding of theoretical concepts	exam	100%
10.5 Seminar/ laboratory/ project	Ability to implement the above in communication at a basic level		
10.6 Minimal performance standard			
• The ability to negotiate basic, grammatically accurate messages in English.			

This course outline was certified in the Interdisciplinary Council meeting on 18.11.2025 and approved by CSUD on 19.11.2025

Prof.dr.ing. Cătălin Alexandru
Director CSUD

Prof. dr. Mona Brigitte Arhire
Director SDI

prof. dr. Marinela Burada
Course convenor

prof. dr. Marinela Burada
Seminar convenor

COURSE OUTLINE

1. Data about the study programme

1.1 Higher education institution	Transilvania University of Brașov
1.2 Faculty	
1.3 Department	Interdisciplinary Doctoral School
1.4 Field of study[1)]	Mechanical Engineering, Industrial Engineering, Electrical Engineering, Comput and Information Technology, Electronic Engineering, Telecommunications and Information Technologies, Materials Engineering, Systems Engineering, Engineering and Management, Silviculture, Forest Engineering, Mathematics, Informatics, Marketing, Sports and Physical Education, Medicine
1.5 Study level[2)]	Doctoral
1.6 Study programme/ Qualification	Mechanical Engineering, Industrial Engineering, Electrical Engineering, Comput and Information Technology, Electronic Engineering, Telecommunications and Information Technologies, Materials Engineering, Systems Engineering, Engineering and Management, Silviculture, Forest Engineering, Mathematics, Informatics, Marketing, Sports and Physical Education, Medicine

2. Data about the course

2.1 Name of course				ENGLISH LANGUAGE IN SCIENCE (ELS-N3) (ADVANCED)				
2.2 Course convenor				Prof. Marinela Burada				
2.3 Seminar				Prof. Marinela Burada				
2.4 Study year	I	2.5 Semester	I	2.6 Evaluation type	E	2.7 Course status	Content[3)]	DC
							Attendance type[4)]	DI

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

3.1 Number of hours per week	2	out of which: 3.2 lecture	1	3.3 seminar/ laboratory/ project	1
3.4 Total number of hours in the curriculum	12	out of which: 3.5 lecture	6	3.6 seminar/ laboratory/ project	6

Time allocation	hours
Study of textbooks, course support, bibliography and notes	40
Additional documentation in libraries, specialized electronic platforms, and field research	40
Preparation of seminars/ laboratories/ projects, homework, papers, portfolios, and essays	28
Tutorial	2
Examinations	3
Other activities.....	=

3.7 Total number of hours of student activity	113
3.8 Total number per semester	125
3.9 Number of credits[5)]	5

4. Prerequisites (if applicable)

4.1 curriculum-related	• N/a
4.2 competences-related	• Upper-intermediate to proficient EL level (reading, speaking, listening, writing)

5. Conditions (if applicable)

5.1 for course development	• multimedia teaching space, internet connection

5.2 for seminar	• multimedia teaching space, internet connection

6. Specific competences and learning outcomes

Professional competences	The students in this group will develop further (1) their professional communication skills, particularly their ability to recognize macro-and microstructural peculiarities of text types subsmed under the academic discourse; (2) the linguistic and rhetoric competencies needed in order to conduct research in one's own field; (3) the theoretical foundation necessary to determine and internalise the rhetorical patterns in texts composed in Romanain and English.
And Transversal	The students will develop their ptofessional communication skills and their metacognitive abilitaties that would enable them to capitalize on their strong points, while meeting the challenges in the communication conducted in their respective fields.

7. Course objectives (resulting from the specific competences to be acquired)

7.1 General course objective	Developing the Ss: study skills, professional communication and dissemination related abilities.
7.2 Specific objectives	Developing the S's ability to process information from specialist texts and to write such texts in keeping with the communication patterns and norms associated with their domain. Honing the Ss' study skills in English. Honing the Ss' abilities to communicate and disseminate the results of their research in keeping with the norms and expectations of to which they belong.

8. Content

8.1 Course	Teaching methods	Number of hours	Remarks
Collecting and structuring information; using sources.	Mixed: Lecturing, interactive	2	
Drafting abstracts.		2	
Preparing and delivering oral presentations.		2	

Selected bibliography

Barton, D. (1994) Literacy. An Introduction to the Ecology of Written Language. Blackwell.Carter, Susan., Guerin, C. & Aitchinson, C. (2020) Doctoral Writing. Practices, Processes and Pleasures. Springer.
Guest, Michael (2018) Conferencing and Presentation for Young Academics. Springer.
Goldbort, Robert (2006) Writing for Science. Yale University Press.
Jordan, R. R. (1999) Academic Writing Course. Third Edition. UK: Pearson Education Limited.
Pecorari, Diane (2008) Academic Writing and Plagiarism. A Linguistic Analysis. London: Continuum International Publishing Group.Swales, John (2004) Research genres: explorations and applications. Cambridge: CUP.
Nuttal, Christine (1982/1996) Teaching Reading Skills in a Foreign Language. U.K.: Heineman.
Wallace, J. Michael (1980/1993) Study Skills in English. Cambridge: CUP.
Wallwork, Adrian (2016) English for Writing Research Papers. Springer.

8.2 Seminar		Number of hours	Remarks
Reading for gist and for specific information. Note-taking. Comparing data.		2	
Analyzing abstracts in different disciplines and identifying their types. Writing an abstract.		2	
Discussing and analysing powerpoint presentations. Planning, writing and laying out information for conference presentations.		2	

Preparing for Q&A sessions.			

Selected bibliography

Carter, Susan., Guerin, C. & Aitchinson, C. (2020) Doctoral Writing. Practices, Processes and Pleasures. Springer.
Guest, Michael (2018) Conferencing and Presentation for Young Academics. Springer.
Goldbort, Robert (2006) Writing for Science. Yale University Press.
Jordan, R. R. (1999) Academic Writing Course. Third Edition. UK: Pearson Education Limited.
Swales, John (2004) Research genres: explorations and applications. Cambridge: CUP.
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Wallace, J. Michael (1980/1993) Study Skills in English. Cambridge: CUP.
Wallwork, Adrian (2016) English for Writing Research Papers. Springer.

9. Correlation of course content with the demands of the labour market (epistemic communities, professional associations, potential employers in the field of study)

Students will be able to communicate effectively in professional settings, in keeping with the interactional patterns specific of the international epistemic communities.

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of the final grade
10.4 Course	Level of acquisition and understanding of theoretical concepts	exam	100%
10.5 Seminar/ laboratory/ project	Ability to implement the above in a written/spoken text		
10.6 Minimal performance standard			
• The ability to write a scientific text in keeping with the academic norms of the discipline; familiarity with the basic concepts associated with the discipline..			

This course outline was certified in the Interdisciplinary Council meeting on 18.11.2025 and approved by CSUD on 19.11.2025

Prof.dr.ing. Cătălin Alexandru
Director CSUD

Prof. dr. Mona Brigitte Arhire
Director SDI

prof. dr. Marinela Burada
Course convenor

prof. dr. Marinela Burada
Seminar convenor

COURSE OUTLINE

1. Data about the study programme

1.1 Higher education institution	Transilvania University of Brașov
1.2 Faculty	
1.3 Department	Interdisciplinary Doctoral School
1.4 Field of study[1)]	All the fields of study, according to the Curriculum
1.5 Study level[2)]	PhD
1.6 Study programme/ Qualification	Mechanical Engineering, Industrial Engineering, Electrical Engineering, Computers and Information Technology, Electronics, Telecommunications and Informational Technologies, Materials Engineering, Systems Engineering, Engineering and management, Forestry, Forest Engineering, Automotive Engineering, Environmental Engineering, Mechatronics and Robotics, Civil Engineering and Building Services, Mathematics, Computer Science, Marketing, Science of Sport and Physical Education, Medicine, Finance, Sociology, Management

2. Data about the course

2.1 Name of course			English Language in Science (level 2)					
2.2 Course convenor			Associate Prof. Dr. Raluca Sinu					
2.3 Seminar/ laboratory/ project convenor			Associate Prof. Dr. Raluca Sinu					
2.4 Study year	I	2.5 Semester	I	2.6 Evaluation type	C	2.7 Course status	Content[3)]	CC
							Attendance type[4)]	CPC

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

3.1 Number of hours per week	2	out of which: 3.2 lecture	1	3.3 seminar/ laboratory/ project	1
3.4 Total number of hours in the curriculum	12	out of which: 3.5 lecture	6	3.6 seminar/ laboratory/ project	6

Time allocation	hours
Study of textbooks, course support, bibliography and notes	40
Additional documentation in libraries, specialized electronic platforms, and field research	40
Preparation of seminars/ laboratories/ projects, homework, papers, portfolios, and essays	28
Tutorial	2
Examinations	3
Other activities	-

3.7 Total number of individual study hours	113
3.8 Total number per semester	125
3.9 Number of credits[5)]	5

4. Prerequisites (if applicable)

4.1 curriculum-related	• Intermediary level of English
4.2 competences-related	• Individual study skills

5. Conditions (if applicable)

5.1 for course development	• Room with projector
5.2 for seminar/ laboratory/ project development	•

6. Specific competences

Professional competences	• Using English adequately in scientific contexts • Applying English to the study of specialized texts, to the translation of research articles and to their presentation at international conferences
Transversal competences	• Identifying and using efficient methods in the study of English

7. Course objectives (resulting from the specific competences to be acquired)

7.1 General course objective	• Consolidating and developing the students' repertoire of English • Applying the students' knowledge of English to scientific contexts
7.2 Specific objectives	• Recognizing and using adequately the verbal tenses in academic texts in English • Rendering qualities and quantities in scientific texts in English

8. Content

8.1 Lecture	Teaching methods	No. of hours	Remarks
Verbal tenses	Discussions and examples	4	
The adjective	Discussions and examples	1	
Expressions of quantity	Discussions and examples	1	

Bibliography

Bailey, Stephen, 2004, *Academic Writing. A Practical Guide for Students*. Routledge

Swales, John M., și Christine B. Feak, 2001, *Academic Writing for Graduate Students. Essential Tasks and Skills - A Course for Nonnative Speakers of English*. Michigan: Ann Arbor

Thomson, A. J., 1986, *A Practical English Grammar*. Oxford: Oxford University Press

8.2 Seminar/ laboratory/ project	Teaching-learning methods	No. of hours	Remarks
Verbal tenses	Exercises and discussions	4	
The adjective	Exercises and discussions	1	
Expressions of quantity	Exercises and discussions	1	

Bibliography

Alexander, L.G., 1991, *Longman English Grammar Practice*. London: Longman

Murphy, Raymond, 1998, *Grammar in Use*. Cambridge: Cambridge University Press

Swan, Michael, and David Baker, 2012, *Grammar Scan: Diagnostic Tests for Practical English Usage* (third edition), Oxford: OUP

9. Correlation of course content with the demands of the labour market (epistemic communities, professional associations, potential employers)

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of the final grade
10.4 Lecture	Adequate use of English language grammatical structures	Written exam	80%
10.5 Seminar/ laboratory/ project	Participation in seminar discussions and activities	Seminar participation	20%
10.6 Minimal performance standard			
•			

This Course Outline was approved by the Council of the Interdisciplinary Doctoral School (SDI) on 18 November 2025 and approved by the Council for Doctoral Studies (CSUD) on 19 November 2025.

Prof. Dr. Eng. Cătălin ALEXANDRU Director of CSUD	Prof. dr. Mona Brigitte ARHIRE Director of SDI
Associate Prof. Dr. Raluca SINU Lecture convenor	Associate Prof. Dr. Raluca SINU Seminar/ laboratory/ project convenor

Note:

1) Field of study – select one of the following options: BA/MA/PhD. (to be filled in according to the forceful classification list for study programmes);

2) Study level – choose from among: BA/MA/PhD.;

3) Course status (content) – for the BA level, select one of the following options: FC (fundamental course) / DC (course in the study domain)/ SC (speciality course)/ CC (complementary course); for the MA level, select one of the following options: PC (proficiency course)/ SC (synthesis course)/ AC (advanced course)

4) Course status (attendance type) – select one of the following options: CPC (compulsory course)/ EC (elective course)/ NCPC (non-compulsory course);

5) One credit is the equivalent of 25 – 30 study hours (teaching activities and individual study).

COURSE OUTLINE

1. Data about the study programme

1.1 Higher education institution	Transilvania University of Brasov
1.2 Faculty	
1.3 Department	Interdisciplinary Doctoral School
1.4 Field of study[1)]	
1.5 Study level[2)]	PhD
1.6 Study programme/ Qualification	

2. Data about the course

2.1 Name of course			Ethics and Academic Integrity					
2.2 Course convenor			PhD Professor Gabriela Ratulea					
2.3 Seminar/ laboratory/ project convenor			PhD Professor Gabriela Ratulea					
2.4 Study year	1	2.5 Semester	1	2.6 Evaluation type	E	2.7 Course status	Content[3)]	DG
							Attendance type[4)]	CPC

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

3.1 Number of hours per week	**2,5**	out of which: 3.2 lecture	**1,5**	3.3 seminar/ laboratory/ project	**1**
3.4 Total number of hours in the curriculum	15	out of which: 3.5 lecture	9	3.6 seminar/ laboratory/ project	6

Time allocation	hours
Study of textbooks, course support, bibliography and notes	40
Additional documentation in libraries, specialized electronic platforms, and field research	45
Preparation of seminars/ laboratories/ projects, homework, papers, portfolios, and essays	15
Tutorial	5
Examinations	5
Other activities.....	

3.7 Total number of hours of student activity	125
3.8 Total number per semester	125
3.9 Number of credits[5)]	5

4. Prerequisites (if applicable)

4.1 curriculum-related	•
4.2 competences-related	•

5. Conditions (if applicable)

5.1 for course development	•
5.2 for seminar/ laboratory/ project development	•

6. Specific competences

Professional competences	• Communication and professional relationship with social actors. • Identification, information gathering, documentation, assessment and recording of information, analysis, evaluation, and specific interventions.
Transversal competences	• Solving in a realistic way - with both theoretical and practical arguments - some usual professional situations, in order to solve them efficiently and ethically.

7. Course objectives (resulting from the specific competences to be acquired)

7.1 General course objective	• Gaining knowledge about the ethical norms of scientific research.
7.2 Specific objectives	• Critical analysis of ethical issues applying concepts, theories and standards on which decisions are made • Evaluation of the appliance of the norms of ethical conduct in the academic environment

8. Content

8.1 Course	Teaching methods	Number of hours	Remarks
Introduction. Fundamental concepts and distinctions	lecture	2	
Ethical evaluation	Lecture and debate	3	
Academical ethics	Lecture and debate	2	
Ethical challenges in universities	Lecture and debate	2	

Bibliography

American Psychological Association (2012). Publication manual of the American Psychological Association

Dunleavy, P. (2003). Authoring a PhD: How to plan, draft, write, and finish a doctoral thesis or dissertation. New York (NY): Palgrave Macmillan.

Ferreol, G. & Flageul N. (2007). Metode și tehnici de exprimare scrisă și orală. Iași: Editura Polirom.

Goldbort, R. (2006). Writing for science. New Haven (CT) & London (UK): Yale University Press.

Koepsell, D. (2017). Scientific integrity and research ethics: An approach from the ethos of science. Springer.

Lathrop A. & Foss K. (2000). Student cheating and plagiarism in the Internet era: A wake-up call. Englewood (CO): Libraries Unlimited, Inc.

Shrader-Fechette, K. S. (2000). Ethics of Scientific Research. Lanham (MA) & London (UK): Rowman &Littlefield.

8.2 Seminar/ laboratory/ project	Teaching-learning methods	Number of hours	Remarks
Integrity issues in universities	Presentation and debate	3	
Research's ethics	Presentation and debate	3	

Bibliography

American Psychological Association (2012). Publication manual of the American Psychological Association

Dunleavy, P. (2003). Authoring a PhD: How to plan, draft, write, and finish a doctoral thesis or dissertation. New York (NY): Palgrave Macmillan.

Ferreol, G. & Flageul N. (2007). Metode și tehnici de exprimare scrisă și orală. Iași: Editura Polirom.

Goldbort, R. (2006). Writing for science. New Haven (CT) & London (UK): Yale University Press.

Koepsell, D. (2017). Scientific integrity and research ethics: An approach from the ethos of science. Springer.

Lathrop A. & Foss K. (2000). Student cheating and plagiarism in the Internet era: A wake-up call. Englewood (CO): Libraries Unlimited, Inc.
Shrader-Fechette, K. S. (2000). Ethics of Scientific Research. Lanham (MA) & London (UK): Rowman &Littlefield.

9. Correlation of course content with the demands of the labour market (epistemic communities, professional associations, potential employers in the field of study)

The aim of the course is to acknowledge the importance of ethics in scientific research. The course will focus on familiarizing students with the responsible assessment of ethical behaviour norms in the academic area and will allow students to attain a higher level of understanding and proficiency in writing an academic text.

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of the final grade
10.4 Course	Writing abilities and analytical skills	Final paper	70%
	Comprehensiveness of analysis and analytic reflection	In-class evaluation	15%
10.5 Seminar/ laboratory/ project	Analytic reflection	In-class evaluation	15%
10.6 Minimal performance standard			
• The students must identify an issue of academic integrity or research ethics. In this regard they have to present the problem, to explain why it is a matter of ethics and integrity, to identify the causes and the effects of the phenomenon, to evaluate it (taking in consideration the ethical evaluation theories) and to identify some solutions for solving the problem.			

This Course Outline was approved by the Council of the Interdisciplinary Doctoral School (SDI) on 18 November 2025 and approved by the Council for Doctoral Studies (CSUD) on 19 November 2025.

Prof. Dr. Eng. Cătălin ALEXANDRU Director of CSUD	Prof. dr. Mona Brigitte ARHIRE Director of SDI
PhD Professor Gabriela Ratulea **Course holder**	**Holder of seminar** **PhD Professor Gabriela Ratulea**

Note:

1) Field of study – select one of the following options: Bachelor / Master / Doctorat (to be filled in according to the forceful classification list for study programmes);

2) Study level – choose from among: Bachelor / Master / Doctorat;

3) Course status (content) – for the Bachelor level, select one of the following options: **FC** (fundamental course) / **DC** (course in the study domain)/ **SC** (speciality course)/ **CC** (complementary course); for the Master level, select one of the following options: **PC** (proficiency course)/ SC (synthesis course)/ **AC** (advanced course);

[4] Course status (attendance type) – select one of the following options: **CPC** (compulsory course)/ **EC** (elective course)/ **NCPC** (non-compulsory course);

[5] One credit is the equivalent of 25 study hours (teaching activities and individual study).

FIŞA DISCIPLINEI

1. Date despre program

1.1 Instituția de învățământ superio	Universitatea Transilvania din Braşov
1.2 Facultatea	-
1.3 Departamentul	Şcoala Doctorală Interdisciplinară
1.4 Domeniul de studii doctoral[1)]	Calculatoare, Filologie, Finante, Marketing, Matematică si informatică, Medicină, Muzică, Ştiința sportului și educației fizice, Silvicultura, Sociologie, Ştiințe inginerești (toate domeniile)
1.5 Ciclul de studii[2)]	Doctorat
1.6 Programul de studii/ Calificarea	Toate domeniile/ programele de doctorat ale SDI

2. Date despre disciplină

2.1 Denumirea disciplinei	**ETICĂ ŞI INTEGRITATE ACADEMICĂ**							
2.2 Titularul activităților de curs				Prof.dr. habil. Elena Cocoradă				
2.3 Titularul activităților de seminar/ laborator/ proiect				Prof.dr. habil. Elena Cocoradă				
2.4 Anul de studiu	I	2.5 Semestrul	I	2.6 Tipul de evaluare	E	2.7 Regimul disciplinei	Conținut[3)]	DCA
							Obligativitate[3)]	DI

3. Timpul total estimat (ore pe semestru al activităților didactice)

3.1 Număr de ore pe săptămână (6 săptămâni)	2,5	din care: 3.2 curs	1,5	3.3 seminar	1
3.4 Total ore din planul de învățământ	15	din care: 3.5 curs	9	3.6 seminar	6 /grupa

Distribuția fondului de timp	ore
Studiul după manual, suport de curs, bibliografie şi notițe	35
Documentare suplimentară în bibliotecă, pe platformele electronice de specialitate şi pe teren	35
Pregătire seminare/ laboratoare/ proiecte, teme, referate, portofolii şi eseuri	35
Tutoriat	2
Examinări	3
Alte activități.....	

3.7 Total ore de activitate a studentului	110
3.8 Total ore pe semestru	125
3.9 Numărul de credite[5)]	5

4. Precondiții (acolo unde este cazul)

4.1 de curriculum	• Nu este cazul
4.2 de competențe	• Nu este cazul

5. Condiții (acolo unde este cazul)

5.1 de desfășurare a cursului	• Acces la platforma e-Learning si videoconferinta, acces la internet si BDI, PC
5.2 de desfăşurare a seminarului/ laboratorului/ proiectului	• Acces la platforma e-Learning si videoconferinta, acces la internet si BDI, PC

6. Competențe specifice acumulate

Competențe profesionale	• Evaluarea independentă a unei cercetări științifice şi a unei lucrări din domeniul de doctorat specific, folosind valorile, principiile şi normele etice si de integritate academica • Aplicarea valorilor, principiilor şi normelor etice si de integritate academica in proiectarea, desfăşurarea si diseminarea rezultatelor unei cercetări științifice din domeniul de doctorat specific

Competențe transversale	• Aplicarea autonoma a normelor etice si de integritate academica in proiectarea, desfașurarea si diseminarea rezultatelor unei cercetări științifice • Asumarea responsabilității față de respectarea normelor de etică si integritate in intreaga viata academica

7. Obiectivele disciplinei (reieşind din competențele specifice acumulate)

7.1 Obiectivul general al disciplinei	Studentii vor fi capabili sa aplice independent si responsabil principiile si normele etice si de integritate academica în proiectarea, implementarea, evaluarea şi diseminarea unei cercetări științifice in domeniile doctorale în care sunt înscrisi si in domenii conexe.
7.2 Obiectivele specifice	• Sa analizeze, critic si independent, problemele şi soluțiile etice prezente într-o cercetare științifică data in domeniului doctoral propriu, folosind teorii, concepte, standarde, legi. • Sa descrie solutii corecte etic in proiectarea si derularea unei cercetari stiintifice • Sa descrie solutii corecte etic in redactarea si diseminarea unei lucrari stiintifice • Sa evalueze /autoevalueze responsabil respectarea normelor de conduită etică în predare-invatare-evaluare si in colaborarea echipelor de cercetare • Sa argumenteze coerent deciziile personale in toate situațiile descrise mai sus, folosind teorii, concepte, norme, legi din domeniu

8. Conținuturi

8.1 Curs	Metode de predare	Număr de ore	Observații
1. Abordari filosofice, istorice şi instituționale ale eticii în cercetarea ştiințifică si viața academică. Teoria consecințelor, etica datoriei, etica bazată pe drepturi, virtuții si îngrijire	Prelegere îmbunătățită prin slide-uri, studii de caz, dezbateri, activitate in grupuri mici	2	
2. Etică şi responsabilitate în protejarea participanților la cercetare, a datelor personale si a calitatii cercetarii științifice. Violarea normelor de etică		2	
3. Rezolvarea problemelor etice specifice diferitelor domenii. Abordări actuale ale evaluării etice în domenii științifice noi (ex.AI)		2	
4. Dimensiunea etica a diseminarii şi publicarii rezultatelor cercetării științifice		2	
5. Integritate si egalitate de gen în viața academică. Dileme etice, pattern-uri comportamentale si factori de risc		1	

Bibliografie

Ahuja, V.K., Baishya, K. (2024). *Research and publication ethics.* Assam.
Carling, J. (2019). *Research ethics and research integrity*. MIGNEX Handbook Chapter 4 (v1). Oslo: Peace research Institute Oslo. *Educ Res Dev,* 34(5), 926–941.
Cocoradă, E. (2022). *Etica si integritate academică*, Suport de curs
European Commission (2010). *European Textbook on Ethics in Research.* Belgium.
Harris, C.E., Pritchard, S.M., James, R.W. et al. (2019). *Engineering Ethics*. Cengage Learning.
World Medical Association (2024). *Declaratia de la Helsinki.*
Zhu, Q., Martin, M.,& Schinzinger, R. (2020). *Ethics in engineering.* McGraw Hill LLC.

8.2 Seminar/ laborator/ proiect	**Metode de predare-învățare**	**Nr. de ore**	**Observații**
Definirea conceptelor de baza in domeniu Standardele etice, legislația românească şi europeană privind buna conduită în cercetarea ştiințifică şi viata academică	Dezbatere Studii de caz nonfictionale si fictionale	1	
Probleme etice specifice proiectarii, implementarii şi evaluarii cercetărilor științifice.	Studii de caz, fictionale si reale, individual si in grup, dezbatere	2	
Integritate în publicarea rezultatelor cercetării (autorat, plagiat şi autoplagiat, conflicte de interes etc.	Aplicații pe o tema de cercetare la alegere/activitate in grupuri mici	1	

Viață academică, cercetări neetice şi dileme etice	Studii de caz, fictionale si nonfictionale, şi reconfigurare	1	
Analiza provocarilor etice si implementarea de solutii corecte etic in cercetarea stiintifica proprie (aplicatie pe draftul pentru proiectul final)	Studiu de caz nonfictional, evaluare si reconfigurare	1	

Bibliografie

ALLEA (2023). *The European Code of Conduct for Research Integrity- Revised Edition.* Berlin.
Armond, A.C.V., Gordijn, B., Lewis, J. *et al.* (2021). A scoping review of the literature featuring research ethics and research integrity cases. *BMC Med Ethics*, 22, 50
CE (2020). *O Uniune a egalității: strategia privind egalitatea de gen 2020-2025*
Bertram Gallant T, Van Den Einde L, Ouellette S, & Lee S. (2014) A systemic analysis of cheating in an undergraduate engineering mechanics course. *Science and Engineering Ethics.* 20(1), 277-298.
Borenstein, J. & Shamoo, A. E. (2015). Rethinking Authorship in the Era of Collaborative Research. *Accountability in Research*, 22(5), 267-283.
European Commission (2016). *General Data Protection Regulation* (https://gdpr-info.eu/)
Kovanović V, Khosravi H, Ferguson R, et al. (2024). Emerging technologies and research ethics: Developing editorial policy using a scoping review and reference panel. *PLoS ONE 19*(10): e0309715.
Munoz-Garcia, A., & Aviles-Herrera, M. J. (2014). Effects of academic dishonesty on dimensions of well-being and satisfaction: a comparative study of secondary school and university students. *Assess Evaluation in Higher Education*, 39(3), 349–363.
***Legea 206/ 2004 privind buna conduită în cercetarea ştiinţifică, dezvoltarea tehnologică şi inovare.
***LIS (2023)
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UTBv. (2024). *Regulamentul_Comisiei_de_etica_universitara* _18.12.2024.pdf

9. Coroborarea conţinuturilor disciplinei cu aşteptările reprezentanţilor comunităţilor epistemice, ale asociaţilor profesionale şi ale angajatorilor reprezentativi din domeniul aferent programului

Disciplina este în acord cu orientările teoretice actuale, cu legislația românească şi europeană si cu politica UNITBv privind etica cercetării ştiinţifice, a publicării rezultatelor si a normelor de integritate din viata academica.

10. Evaluare

Tip de activitate	10.1 Criterii de evaluare	10.2 Metode de evaluare	10.3 Pondere din nota finală
10.4 Curs	• Analiza, din perspectivă etică, a unei cercetări prin raportare la valori, principii şi standarde etice si de integritate • Argumentarea abaterilor etice intr-o lucrare stiintifica data prin raportare la valori, teorii, norme etice • Propunerea argumentata de solutii corective la abaterile etice, in acord cu principiile şi normele de etică si de integritate academica • Propunerea de solutii adecvate etic pentru rezolvarea unor dileme etice intr-o cercetare /situatie data	Examen scris: analizei unei cercetări ştiinţifice / a unui articol din perspectiva respectării principiilor şi normelor de etică, cu propunerea de solutii etice corective *Lucrarile vor fi postate pe platforma elearning*	70%
10.5 Seminar	Aceleaşi criterii ca şi în evaluarea cursului Implicare responsabilă în activităţi	Observarea activităţii Interevaluare	30%
10.6 Standard minim de performanţă: identificarea si explicarea a 4 încălcări ale normelor de etică a cercetării ştiinţifice într-un caz dat şi descrierea, argumentata, a câte unei soluţii acceptabile etic pentru fiecare.			

Prezenta Fișă de disciplină a fost avizată în ședința de ConsiliuL SDI din data de 18.11.2025 și aprobată de CSUD în data de 19.11.2025.

Prof.dr. ing. Cătălin ALEXANDRU,
Directorul CSUD.....

Prof. dr. Mona Brigitte ARHIRE,
Directorul SDI .....

Prof. dr. Elena COCORADĂ,
Titulara de curs

Prof. dr. Elena COCORADĂ,
Titulara de seminar

Notă:
1) Domeniul de studii - se alege una din variantele: Licență/ Masterat/ Doctorat (se completează conform cu Nomenclatorul domeniilor și al specializărilor/ programelor de studii universitare în vigoare);
2) Ciclul de studii - se alege una din variantele: Licență/ Masterat/ Doctorat;
3) Regimul disciplinei (conținut) - se alege una din variantele: DF (disciplină fundamentală)/ DD (disciplină din domeniu)/ DS (disciplină de specialitate)/ DC (disciplină complementară) - pentru nivelul de licență; DAP (disciplină de aprofundare)/ DSI (disciplină de sinteză)/ DCA (disciplină de cunoaștere avansată) - pentru nivelul de masterat;
4) Regimul disciplinei (obligativitate) - se alege una din variantele: DI (disciplină obligatorie)/ DO (disciplină opțională)/ DFac (disciplină facultativă);
5) Un credit este echivalent cu 25 – 30 de ore de studiu (activități didactice și studiu individual).

FIȘA DISCIPLINEI

1. Date despre program

1.1 Instituția de învățământ superior	Universitatea Transilvania din Brașov
1.2 Facultatea	
1.3 Departamentul	Școala Doctorală Interdisciplinară
1.4 Domeniul de studii de doctorat[1)]	
1.5 Ciclul de studii[2]	Doctorat
1.6 Programul de studii/ Calificarea	

2. Date despre disciplină

2.1 Denumirea disciplinei	Intellectual Property /Dreptul proprietății intelectuale							
2.2 Titularul activităților de curs	Cons.P.I.,C.S.,Ing.IoanȚOȚU							
2.3 Titularul activităților de seminar/ laborator/ proiect	Cons.P.I.,C.S.,Ing.IoanȚOȚU							
2.4 Anul de studiu	I	2.5 Semestrul	I	2.6 Tipul de evaluare		2.7 Regimul disciplinei	Conținut[3)]	
							Obligativitate[3)]	DO

3. Timpul total estimat (ore pe semestru al activităților didactice)

3.1 Număr de ore pe săptămână		din care: 3.2 curs		3.3 seminar/ laborator/ proiect	
3.4 Total ore din planul de învățământ	12	din care: 3.5 curs	6	3.6 seminar/ laborator/ proiect	6

Distribuția fondului de timp	ore
Studiul după manual, suport de curs, bibliografie și notițe	16
Documentare suplimentară în bibliotecă, pe platformele electronice de specialitate și pe teren	16
Pregătire seminare/ laboratoare/ proiecte, teme, referate, portofolii și eseuri	8
Tutoriat	2
Examinări	2
Alte activități	-

3.7 Total ore de activitate a studentului	44
3.8 Total ore pe semestru	44
3.9 Numărul de credite[5)]	

4. Precondiții (acolo unde este cazul)

4.1 de curriculum	•Notiuni de baza in domeniul temei de doctorat.Notiuni de baza privind analiza muticriteriala
4.2 de competențe	•Capacitatea de a analiza si de a sintetiza informațiile din baze de date

5. Condiții (acolo unde este cazul)

5.1 de desfășurare a cursului	•sala de curs dotata cu videoproiector si acces la internet
5.2 de desfășurare a seminarului	•sala de curs dotata cu videoproiector si acces la internet

6. Competențe specifice acumulate

Competențe profesionale	Însușirea noțiunilor de baza privind proprietatea intelectuala si industriala. Dobândirea cunoștințelor necesare pentru identificarea/recunoașterea elementelor de proprietate intelectuala /industriala. Dobândirea cunoștințelor necesare pentru constituirea/înregistrarea dreptului de proprietate asupra creațiilor intelectuale(dreptul de autor) si industriale(invenții, mărci, desene si modele industriale, modele de utilitate) Formarea deprinderii privind cercetarea documentara in baze de date disponibile(portaluri internet, aplicații software de specialitate, baze de date brevet si non brevet, cursuri online etc.)in domeniul specific temei de doctorat
Competențe transversale	Cunoașterea normelor legale în domeniul constituirii dreptului de proprietate asupra creației intelectuale si industriale Capacitatea de auto-organizare, de stabilire a obiectivelor și de planificare a activităților. Însușirea stilului de muncă responsabil

7. Obiectivele disciplinei (reieşind din competenţele specifice acumulate)

7.1 Obiectivul general al disciplinei	•Dobândirea abilitaţilor privind cercetarea in bazele de date brevet si non brevet in domeniul specific studiilor doctorale proprii
7.2 Obiectivele specifice	•Dobândirea abilitaţii de valorificare/structurare a informaţiilor rezultate din cercetarea documentara, de identificare a soluţiilor optime rezultate prin analiza multicriteriala . Iniţierea unei baze de date proprii in domeniul specific lucrării de doctorat

8. Conţinuturi

8.1 Curs	Metode de predare	Număr de ore	Observaţii
Proprietatea Intelectuală; Forme de constituire şi de protecţie..	Prelegere clasică, prelegere pe baza prezentării .ppt, demonstraţie didactică,	2	
Brevetul de invenţie; invenţia brevetabila; structura unei Descrieri de Invenţie..	Prelegere clasică, prelegere pe baza prezentării Indrumarului de descriere de inventie demonstraţie didactică,	2	
Informaţia ca resursă. Baze de date. Cercetări documentare.	prelegere clasică, prelegere pe baza prezentării .ppt, demonstraţie interactiva	2	

Bibliografie

Yolanda,Eminescu. *Dreptul de autor*. Ed.Lumina Lex, Bucureşti, 1994.
Valeriu, Erhan. *Brevetarea invenţiilor în România.* ,Ed. Economică, Bucureşti,1998.
Dicţionar ilustrat de proprietate industrială.,Ed. OSIM, Bucureşti, 2003.
Legi de proprietate industrială administrate de OSIM., Ed. OSIM, Bucureşti, 2003.
Convenţia Brevetului European., Ed. OSIM, Bucureşti, 2003.
Roş Viorel, *Dreptul proprietăţii intelectuale.*,Ed. Global Lex.,Bucureşti,2001
Stefan,Cocos.,*Marci nationale si marci comunitare*, Ed.TribunaEconomica, Bucuresti,2007
OSIM https://osim.ro/
EUIPO https://euipo.europa.eu/ohimportal/ro/web/guest/home , Search - EUIPO
WIPO https://www.wipo.int/portal/en/index.html
WIPO E-LEARNING CENTER Academy Course Catalog
OEB https://www.epo.org/
OMPI - International Patent Classification (IPC)
USPTO Home - Patent Center - USPTO
GOOGLE PATENTS https://patents.google.com/

8.2 Seminar/ laborator/ proiect	Metode de predare-învăţare	Număr de ore	Observaţii
Constituirea si transmiterea drepturilor de proprietate intelectuala - studii de caz .	seminar interactiv	1	
Constituirea si transmiterea drepturilor de proprietate industriala - studiile de caz.	seminar interactiv	1	
Structura descrierii de invenţie	seminar interactiv	2	
Întocmirea bazei de date proprii privind informaţia brevet si non brevet	seminar interactiv	2	

Bibliografie

Dreptul proprietăţii intelectuale.Culegere de speţe,modele de contracte.modele de acţiuni,Ed.Themis Chart.,Slatina,2003
Valerică, Lazăr. *Infracţiuni contra drepturilor de proprietate intelectuală.*,Ed.Al Beck.,Bucureşti,1999.
Burchel,Nicolae.ş.a., *Buletin de jurisprudenţă în domeniul proprietăţii intelectuale.*,Ed.OSIM.,Bucureşti.2005
Glosar de terminologie privind proprietatea intelectuală.,Program PHARE RO 0107.06.01.,Bucuresti,2003
WIPO-OMPI, *Introducere în proprietatea intelectuală.*, Ed.Rosetti,Bucureşti,2001.
Cristinel, Murzea.,s.a. *Notiuni deproprietatei ntelectuala*,Ed.Romprint,Brasov,2004
Alexandru, C. Strenc, s.a.,*DreptulBrevetului,Vol.I,II*,Ed.Luminalex,Bucuresti,2007
Ioan,Totu, *Indrumar pentru întocmirea unei descrieri de invenţie*, Universitatea Transilvania din Brasov,B.P.I. 2024

9. Coroborarea conținuturilor disciplinei cu așteptările reprezentanților comunităților epistemice, ale asociaților profesionale și ale angajatorilor reprezentativi din domeniul aferent programului

10. Evaluare

Tip de activitate	10.1 Criterii de evaluare	10.2 Metode de evaluare	10.3 Pondere din nota finală
10.4 Curs	Insusirea cunostintelor	Test final pe baza unor discutii	30%
10.5 Seminar/ laborator/ proiect	Corectitudinea cercetarii documentare si a realizarii bazei de date proprii	Transmitere referat via e-mail si evaluare	70%
10.6 Standard minim de performanță			
•realizarea unui referat cu prezentarea bazei de date proprii brevet si non brevet			

Prezenta Fișă de disciplină a fost avizată în ședința de Consiliul SDI din data de 18.11.2025 și aprobată de CSUD în data de 19.11.2025.

Prof. dr. Cătălin ALEXANDRU Director CSUD	Prof. Dr. Mona Brigitte ARHIRE Director SDI
Cons.P.I.,C.S.,ing. IoanȚOȚU Titular de curs	Cons.P.I.,C.S.,ing. IoanȚOȚU. Titular de seminar/ laborator/ proiect

Notă:

1) Domeniul de studii - se alege una din variantele: Licență/ Masterat/ Doctorat (se completează conform cu Nomenclatorul domeniilor și al specializărilor/ programelor de studii universitare în vigoare);
2) Ciclul de studii - se alege una din variantele: Licență/ Masterat/ Doctorat;
3) Regimul disciplinei (conținut) - se alege una din variantele: DF (disciplină fundamentală)/ DD (disciplină din domeniu)/ DS (disciplină de specialitate)/ DC (disciplină complementară) - pentru nivelul de licență; DAP (disciplină de aprofundare)/ DSI (disciplină de sinteză)/ DCA (disciplină de cunoaștere avansată) - pentru nivelul de masterat;
4) Regimul disciplinei (obligativitate) - se alege una din variantele: DI (disciplină obligatorie)/ DO (disciplină opțională)/ DFac (disciplină facultativă);
5) Un credit este echivalent cu 25 – 30 de ore de studiu (activități didactice și studiu individual).

COURSE OUTLINE

1. Data about the study programme

1.1 Higher education institution	Transilvania University of Brașov
1.2 Faculty	
1.3 Department	Interdisciplinary Doctoral School
1.4 Field of study[1)]	
1.5 Study level[2)]	PhD
1.6 Study programme/ Qualification	

2. Data about the course

2.1 Name of course			Research Projects: Management and Resources					
2.2 Course convenor			Prof. Dr. Alexandru ENESCA					
2.3 Seminar/ laboratory/ project convenor			Prof. Dr. Alexandru ENESCA					
2.4 Study year	I	2.5 Semester	I	2.6 Evaluation type	E1	2.7 Course status	Content[3)]	DS
							Attendance type[4)]	DI

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

3.1 Number of hours per week (6 weeks)	2	out of which: 3.2 lecture	1	3.3 seminar/ laboratory/ project	1
3.4 Total number of hours in the curriculum	12	out of which: 3.5 lecture	6	3.6 seminar/ laboratory/ project	6

Time allocation	hours
Study of textbooks, course support, bibliography and notes	30
Additional documentation in libraries, specialized electronic platforms, and field research	50
Preparation of seminars/ laboratories/ projects, homework, papers, portfolios, and essays	27
Tutorial	2
Examinations	4
Other activities	

3.7 Total number of individual study hours	113
3.8 Total number per semester	12
3.9 Number of credits[5)]	125

4. Prerequisites (if applicable)

4.1 curriculum-related	• -
4.2 competences-related	• -

5. Conditions (if applicable)

5.1 for course development	• Course room, with video projector and internet connexion
5.2 for seminar/ laboratory/ project development	• Computer room, with PC for PhD students and with internet connexion

6. Specific competences

Professional competences	• Performing calculations and demonstrations to solve specific industrial engineering tasks based on knowledge from fundamental sciences • Associating knowledge, principles and methods from the technical sciences of the field with graphic representations to solve specific tasks.
Transversal competences	• Applying the values and ethics of the engineering profession and responsible execution of professional tasks under conditions of limited autonomy and qualified assistance. Promoting logical, convergent and divergent reasoning, the practical applicability of evaluation and self-evaluation in decision-making.

7. Course objectives (resulting from the specific competences to be acquired)

7.1 General course objective	• Learning the skills necessary for the elaboration, development, optimization and coordination of projects specific to the field.
7.2 Specific objectives	• Identifying methods for accessing projects; • Developing skills necessary for project development; • Developing skills for identifying weaknesses/strengths in a project; • Developing project coordination skills.

8. Content

8.1 Lecture	Teaching methods	No. of hours	Remarks
Identification of priority areas with international funding.	Lecture Explanation Heuristic conversation Algorithmization Problematization Case study	1	
Choosing the right project type vs. funding source		1	
Developing the primary structure of the project		1	
Identifying objectives/activities/deliverables		1	
Project budget development		1	
Performance indicators		1	
Bibliography 1. The project proposal writing handbook, Jhon Chikati, Ed. Regional Partnership for Resource Development, ISBN 9966-96 2008 2. The Complete Book of Grant Writing, Nancy Burke Smith, E. Gabriel Works, Ed. Sourcebooks, ISBN 9781402267291, 201 3. Research Methodology and Scientific Writing, C. George Thomas, Ed. Springer, ISBN 9783030648657, 2021 4. Course Notes, eLearning, A. Enesca			

8.2 Seminar/ laboratory/ project	Teaching-learning methods	No. of hours	Remarks
Identifying a project theme	Working group	1	
Project implementation (structure, budget, indicators)		3	
Project presentation		2	
Bibliography 1. The project proposal writing handbook, Jhon Chikati, Ed. Regional Partnership for Resource Development, ISBN 9966-96 2008 2. The Complete Book of Grant Writing, Nancy Burke Smith, E. Gabriel Works, Ed. Sourcebooks, ISBN 9781402267291, 201 3. Research Methodology and Scientific Writing, C. George Thomas, Ed. Springer, ISBN 9783030648657, 2021 4. Course Notes, eLearning, A. Enesca			

9. Correlation of course content with the demands of the labour market (epistemic communities, professional associations, potential employers)

The content of the discipline is in line with the demands of specific national professional associations.

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of the final grade
10.4 Lecture	Correct use of project-specific concepts, terms, notions, algorithms and symbols	On-going	30%
10.5 Seminar/ laboratory/ project	Project proposal development	Examination	70%
10.6 Minimal performance standard			
• Mastering the basic elementary notions of the discipline; mastering basic application skills and testing them.			

This Course Outline was approved by the Council of the Interdisciplinary Doctoral School (SDI) on 18 November 2025 and approved by the Council for Doctoral Studies (CSUD) on 19 November 2025.

Prof. Dr. Eng. Cătălin ALEXANDRU Director of CSUD	Prof. dr. Mona Brigitte ARHIRE Director of SDI
Prof. Dr. Alexandru ENESCA Lecture convenor	Prof. Dr. Alexandru ENESCA Seminar/ laboratory/ project convenor

Note:

1) Field of study – select one of the following options: BA/MA/PhD. (to be filled in according to the forceful classification list for study programmes);

2) Study level – choose from among: BA/MA/PhD.;

3) Course status (content) – for the BA level, select one of the following options: FC (fundamental course) / DC (course in the study domain)/ SC (speciality course)/ CC (complementary course); for the MA level, select one of the following options: PC (proficiency course)/ SC (synthesis course)/ AC (advanced course)

4) Course status (attendance type) – select one of the following options: CPC (compulsory course)/ EC (elective course)/ NCPC (non-compulsory course);

5) One credit is the equivalent of 25 – 30 study hours (teaching activities and individual study).

COURSE OUTLINE

1. Data about the study programme

1.1 Higher education institu	Transilvania University of Brașov
1.2 Faculty	
1.3 Department	Interdisciplinary Doctoral School
1.4 Field of study[1)]	Engineering
1.5 Study level[2)]	PhD
1.6 Study programme/ Qualification	

2. Data about the course

2.1 Name of course			Statistics in research					
2.2 Course convenor			Prof. Dr. Ion Catalin Petritan					
2.3 Seminar			Prof. Dr. Ion Catalin Petritan					
2.4 Study year	I	2.5 Semester	I	2.6 Evaluation type	E	2.7 Course status	Content[3)]	
							Attendance type[4)]	EC

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

3.1 Number of hours per week	2	out of which: 3.2 lecture	1	3.3 seminar	1
3.4 Total number of hours in the curriculum	12	out of which: 3.5 lecture	6	3.6 seminar	6

Time allocation	hours
Study of textbooks, course support, bibliography and notes	20
Additional documentation in libraries, specialized electronic platforms, and field research	52
Preparation of seminars/ laboratories/ projects, homework, papers, portfolios, and essays	30
Tutorial	5
Examinations	6
Other activities	

3.7 Total number of individual study hours	113
3.8 Total number per semester	125
3.9 Number of credits[5)]	5

4. Prerequisites (if applicable)

4.1 curriculum-related	•
4.2 competences-related	•

5. Conditions (if applicable)

5.1 for course development	• Active attendance at class
5.2 for seminar	• Active attendance at class

6. Specific competences

Professional competences	• Exploring the advantages offered by modern statistical analysis for evaluating the structure and functioning of engineering systems.

Transversal competences	• Ensuring that doctoral students understand statistical methods and concepts • Supporting students in understanding the interpretation of statistical results • Engaging in active and direct learning of doctoral students for professional career preparation • Use of information and communication technology • Communication skills, written and oral, in the field of engineering sciences

7. Course objectives (resulting from the specific competences to be acquired)

7.1 General course objective	• Developing cross-disciplinary skills in statistical analysis of phenomena and processes in the field of engineering
7.2 Specific objectives	• Training in cross-disciplinary skills related to the use of computer systems for statistical data analysis • Training in multivariate data analysis skills. • Training in skills related to the use of statistical analysis results in scientific papers and the dissemination of those results.

8. Content

8.1 Lecture	Teaching methods	No. of hours	Remarks
Exploration of experimental data (descriptive statistics– arithmetic mean, median, quartiles, deciles, percentiles, mode, variance, standard deviation, standard error of the mean, coefficient of variation, relative errors, asymmetry index, excess index, graphical visualization of data, exploration of the relationship between variables–covariance, correlations)	Interactive teaching	1	
Theoretical distributions (normal, Poisson, Bernoulli, Fisher, Student) + Statistical hypothesis testing (Student's t-test, Wilcoxon test, Mann-Whitney U test, Fisher's test, Chi-square test, Shapiro-Wilk test, Kolmogorov-Smirnov test)	Interactive teaching	1	
One-way/two way analysis of variance - ANOVA (variance conditions, pair comparison and multiple testing, Kruskal-Wallis test, Friedman test), covariance analysis - ANCOVA	Interactive teaching	1.5	
Regression analysis (simple, multiple, and factorial regression).	Interactive teaching	1.5	
Multivariate analysis (principal component analysis, cluster analysis, factor analysis)	Interactive teaching	1	
Bibliography Quinn, G.P., Keough, M.J. 2002. Experimental Design and Data Analysis for biologists. Cambridge University Press			

Verzani, J. 2005. Using R for Introductory Statistics. Taylor &Francis Crawley, M.J. 2013. The R Book. John Wiley & Sons, Ltd.			
8.2 Seminar/ laboratory/ project	Teaching-learning methods	No. of hours	Remarks
Exploration of experimental data (descriptive statistics– arithmetic mean, median, quartiles, deciles, percentiles, mode, variance, standard deviation, standard error of the mean, coefficient of variation, relative errors, asymmetry index, excess index, graphical visualization of data, exploration of the relationship between variables–covariance, correlations)	Practical application on computer	1	
Theoretical distributions (normal, Poisson, Bernoulli, Fisher, Student) + Statistical hypothesis testing (Student's t-test, Wilcoxon test, Mann-Whitney U test, Fisher's test, Chi-square test, Shapiro-Wilk test, Kolmogorov-Smirnov test)	Practical application on computer	1	
One-way/two way analysis of variance - ANOVA (variance conditions, pair comparison and multiple testing, Kruskal-Wallis test, Friedman test), covariance analysis - ANCOVA	Practical application on computer	1.5	
Regression analysis (simple, multiple, and factorial regression).	Practical application on computer	1.5	
Multivariate analysis (principal component analysis, cluster analysis, factor analysis)	Practical application on computer	1	
Bibliography Quinn, G.P., Keough, M.J. 2002. Experimental Design and Data Analysis for biologists. Cambridge University Press Verzani, J. 2005. Using R for Introductory Statistics. Taylor &Francis Crawley, M.J. 2013. The R Book. John Wiley & Sons, Ltd.			

9. Correlation of course content with the demands of the labour market (epistemic communities, professional associations, potential employers)

The content of the discipline meets the expectations of organizations in various fields of activity, with graduates of the course being able to apply statistical analyses and formulate scientific conclusions based on the experimental data collected and the results obtained. The skills acquired are an essential prerequisite for the development of complex research projects. Doctoral students will be able to undertake complex research projects and interpret the information resulting from such research.

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of the final grade
10.4 Lecture	Solving specific situations related to data analysis	Applications on computer	90%

10.5 Seminar	attendance	Active participation	10%
10.6 Minimal performance standard			
• Correct analysis of data resulting from research specific to each field of engineering, as well as correct interpretation of the results obtained			

This Course Outline was approved by the Council of the Interdisciplinary Doctoral School (SDI) on 18 November 2025 and approved by the Council for Doctoral Studies (CSUD) on 19 November 2025.

Prof. Dr. Eng. Cătălin ALEXANDRU Director of CSUD	Prof. dr. Mona Brigitte ARHIRE Director of SDI
Prof. Dr. Lecture convenor *Ion Catalin Petritan*	Prof. Dr. Seminar Ion Catalin Petritan

Note:

1) Field of study - select one of the following options: BA/MA/PhD. (to be filled in according to the forceful classification list for study programmes);

2) Study level - choose from among: BA/MA/PhD.;

3) Course status (content) - for the BA level, select one of the following options: FC (fundamental course) / DC (course in the study domain)/ SC (speciality course)/ CC (complementary course); for the MA level, select one of the following options: PC (proficiency course)/ SC (synthesis course)/ AC (advanced course)

4) Course status (attendance type) - select one of the following options: CPC (compulsory course)/ EC (elective course)/ NCPC (non-compulsory course);

5) One credit is the equivalent of 25 - 30 study hours (teaching activities and individual study).