UNIVERSITATEA
LUCIAN BLAGA
— DIN SIBIU —

COURSE SYLLABUS

Academic year 2024 - 2025

1. Programme Information

1.1. Higher education institution	Lucian Blaga University of Sibiu
1.2. Faculty	Faculty of Engineering
1.3. Department	Department of Computer Science and Electrical and Electronics Engineering
1.4. Field of study	Computer Science and Information Technology
1.5. Level of study	Master
1.6. Programme of study/qualification	ADVANCED COMPUTING SYSTEMS

2. Course Information

2.1. Name of course	Cybersecurity	Cod	ACS.304.RA
2.2. Course coordinator	prof. dr. ing. Remus BRAD		
2.3. Seminar/laboratory coordinator	prof. dr. ing. Remus BRAD		

2.4. Year of study[1]	2	**2.5.** Semester[2]	3	**2.6.** Evaluation form[3]	E
2.7. Course type[4]		A	**2.8.** The formative category of the course[5]		R

3. Estimated Total Time

3.1. Course Extension within the Curriculum – Number of Hours per Week

3.1.a. Lecture	3.1.b. Seminar	3.1.c. Laboratory	3.1.d. Project	3.1.e. Other	Total
1		2			**3**

3.2. Course Extension within the Curriculum – Total Number of Hours within the Curriculum

3.2.a. Lecture	3.2.b. Seminar	3.2.c. Laboratory	3.2.d. Project	3.2.e. Other	Total[6]
14		28			**42**

Time Distribution for Individual Study[7]	Nr. ore
Learning by using course materials, references and personal notes	15
Additional learning by using library facilities, electronic databases and on-site information	10
Preparing seminars / laboratories, homework, portfolios and essays	42
Tutorial activities[8]	12
Exams[9]	4
3.3. Total Individual Study Hours[10] (*NOSIsem*)	**83**
3.4. Total Hours in the Curriculum (*NOADsem*)	**42**
3.5. Total Hours per Semester[11] (*NOADsem + NOSIsem*)	**125**
3.6. No. of Hours / ECTS	**25**
3.7. Number of credits[12]	**5**

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4. Prerequisites (if needed)

4.1. Courses that must be successfully completed first (from the curriculum)[13]	Computer Networks
4.2. Competencies	Operating systems, programming

5. Conditions (where applicable)

5.1. For course/lectures[14]	Video Projector, On-line platforms, Journal papers, etc.
5.2. For practical activities (lab/sem/pr/app)[15]	Cisco CCNA Security Bundle

6. Specific competencies acquired[16]

		Number of credits assigned to the discipline [17]	5	Credits distribution by competencies [18]
6.1. Professional competencies	PC4	applies IT security policies		1
	PC9	defines technical requirements		1
	PC26	designs control systems		1
	PC33	develop cloud computing services		1
	PC34	performs modification and transfer of applications to the cloud		1
6.2. Transversal competencies	TC1	demonstrates commitment		0
	TC2	manages personal development		0

7. Course objectives (resulted from developed competencies)

7.1. Main course objective	Students should gain an understanding of the current threat landscape, including various types of cyber threats such as malware, phishing, ransomware, insider threats, and advanced persistent threats (APTs). This involves learning the basic principles and concepts of cybersecurity, including confidentiality, integrity, availability, authentication, authorization, and non-repudiation. Understanding how networks operate and how to secure them against various threats, including securing network devices, implementing firewalls, intrusion detection systems (IDS), intrusion prevention systems (IPS), and virtual private networks (VPNs).
	Learning about cryptographic algorithms, protocols, and techniques used to secure data in transit and at rest, including encryption, decryption, digital signatures, hashing, and key management.
7.2. Specific course objectives	Knowledge of Incident Response and Management: Knowledge of Security Risk Managemen Knowledge of Security Compliance and Governance

8. Content

8.1. Lectures [19]		Teaching methods[20]	Hours
Lecture 1	Understanding Threat Landscape	Exposition,discussions	2
Lecture 2	Fundamentals of Security	Exposition,discussions	2

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Lecture 3	Network Security	Exposition,discussions	2
Lecture 4	Cryptography	Exposition,discussions	2
Lecture 5	Ethical Hacking and Penetration Testing	Exposition,discussions	2
Lecture 6	Security Awareness and Training	Exposition,discussions	2
Lecture 7	Security Compliance and Governance	Exposition,discussions	2
		Total lecture hours:	**14**

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8.2. Practical activities (8.2.a. Seminar[21]/ 8.2.b. Laboratory[22]/ 8.2.c. Project[23])		Teaching methods	Hours
Lab 1	Network Enumeration and Scanning	Exercise, experiment	2
Lab 2	Firewall Configuration and Testing	Exercise, experiment	2
Lab 3	Web Application Vulnerability Assessment	Exercise, experiment	2
Lab 4	Password Cracking	Exercise, experiment	2
Lab 5	Wireless Network Security	Exercise, experiment	2
Lab 6	Endpoint Security	Exercise, experiment	2
Lab 7	Cryptography Lab	Exercise, experiment	2
Lab 8	Social Engineering Awareness	Exercise, experiment	2
Lab 9	Incident Response Simulation	Exercise, experiment	2
Lab 10	Network Traffic Analysis	Exercise, experiment	2
Lab 11	Secure Coding Practices	Exercise, experiment	2
Lab 12	Security Policy Review and Compliance	Exercise, experiment	2
Lab 13	Container Security	Exercise, experiment	2
Lab 14	Threat Hunting and Intelligence	Exercise, experiment	2
		Total seminar/laboratory hours:	28

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9. Bibliography

9.1. Recommended Bibliography	Network Security Essentials: Applications and Standards" by William Stallings
	Hacking: The Art of Exploitation" by Jon Erickson
9.2. Additional Bibliography	Security Engineering: A Guide to Building Dependable Distributed Systems" by Ross J. Anderson:
	Online Resources: Additionally, online platforms such as SANS Institute, Cybrary, and Coursera offer a wide range of cybersecurity courses, tutorials, and resources

10. Conjunction of the discipline's content with the expectations of the epistemic community, professional associations and significant employers of the specific study program[24]

Students will acquire research skills and synthesis abilities preparing them for the transition to a new stage of doctoral admission.
It is carried out through regular discussions in a formal and informal setting with the representatives of the profile companies.

11. Evaluation

Activity Type	11.1 Evaluation Criteria	11.2 Evaluation Methods		11.3 Percentage in the Final Grade	Obs.[25]
11.4a Exam / Colloquy	• Theoretical and practical knowledge acquired (quantity, correctness, accuracy)	Tests during the semester[26]:	25%	100%	CPE
		Homework:	25%		
		Other activities[27]:	0%		
		Final evaluation:	50%		
11.5 Minimum performance standard[28] The final assessment will include written work consisting of (partial) grid tests and problems. • Knowledge, understanding and explaining the basics of evolutionary computing. • Constant interest to acquire discipline. • Partial fulfilment (50%) of homework, essays and tests given during the semester.					CPE

The Course Syllabus will encompass components adapted to persons with special educational needs (SEN – people with disabilities and people with high potential), depending on their type and degree, at the level of all curricular elements (skills, objectives, contents, teaching methods, alternative assessment), in order to ensure fair opportunities in the academic training of all students, paying close attention to individual learning needs.

Filling Date: 09.09.2024

Department Acceptance Date: 16.09.2024

	Academic Rank, Title, First Name, Last Name	Signature
Course Teacher	Prof. Remus BRAD, PhD	
Study Program Coordinator	Prof. Adrian FLOREA, PhD	
Head of Department	Assoc. Prof. Radu George CREȚULESCU, PhD	

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Dean	Prof. Maria VINȚAN, PhD	

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[1] *1-4 for bachelor, 1-2 for master*
[2] *1-8 pentru licență, 1-3 pentru master*
[3] *Exam, colloquium or VP A/R - from the curriculum*
[4] *Course type: R = Compulsory course; E = Elective course; O = Optional course*
[5] *Formative category: S = Specialty; F = Fundamental; C = Complementary; I = Fully assisted; P = Partially assisted; N = Unassisted*
[6] *Este egal cu 14 săptămâni x numărul de ore de la punctul 3.1 (similar pentru 3.2.a.b.c.)*
[7] *The following lines refer to individual study; the total is completed at point 3.37.*
[8] *Between 7 and 14 hours*
[9] *Between 2 and 6 hours*
[10] *The sum of the values from the previous lines, which refer to individual study.*
[11] *The sum (3.5.) between the number of hours of direct teaching activity (NOAD) and the number of hours of individual study (NOSI) must be equal to the number of credits assigned to the discipline (point 3.7) x no. hours per credit (3.6.)*
[12] *The credit number is computed according to the following formula, being rounded to whole neighbouring values (either by subtraction or addition*

$$No.\,credits = \frac{NOCpSpD \times C_C + NOApSpD \times C_A}{TOCpSdP \times C_C + TOApSdP \times C_A} \times 30\,credits$$

Where:
- NOCpSpD = Number of lecture hours / week / discipline for which the credits are calculated
- NOApSpD = Number of application hours (sem./lab./pro.) / week / discipline for which the credits are calculated
- TOCpSdP = Total number of course hours / week in the Curriculum
- TOApSdP = Total number of application hours (sem./lab./pro.) / week in the Curriculum
- C_C/C_A = Course coefficients / applications calculated according to the table

Coefficients	Course	Applications (S/L/P)
Bachelor	2	1
Master	2,5	1,5
Bachelor - foreign language	2,5	1,25

[13] *The courses that should have been previously completed or equivalent will be mentioned*
[14] *Board, video projector, flipchart, specific teaching materials, online platforms, etc.*
[15] *Computing technology, software packages, experimental stands, online platforms, etc.*
[16] *Competences from the Grids related to the description of the study program, adapted to the specifics of the discipline*
[17] *Din planul de învățământ*
[18] *Creditele alocate disciplinei se distribuie pe competențe profesionale și transversale în funcție de specificul disciplinei*
[19] *Titluri de capitole și paragrafe*
[20] *Exposition, lecture, board presentation of the studied topic, use of video projector, discussions with students (for each chapter, if applicable)*
[21] *Discussions, debates, presentations and/or analyses of papers, solving exercises and problems*
[22] *Practical demonstration, exercise, experiment*
[23] *Case study, demonstration, exercise, error analysis, etc.*
[24] *The relationship with other disciplines, the usefulness of the discipline on the labour market*
[25] *CPE – Conditions Exam Participation; nCPE – Does Not Condition Exam Participation; CEF - Conditions Final Evaluation; N/A – not applicable*
[26] *The number of tests and the weeks in which they will be taken will be specified*
[27] *Scientific circles, professional competitions, etc.*
[28] *The minimum performance standard in the competence grid of the study program is customized to the specifics of the discipline, if applicable*

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