SYLLABUS

1. Data about the program of study

1.1 Institution	Technical University of Cluj-Napoca
1.2 Faculty	Faculty of Electronics, Telecommunications and information Technology
1.3 Department	Communications
1.4 Field of study	Electronic Engineering, Telecommunications and Information Technologies
1.5 Cycle of study	Bachelor of Science
1.6 Program of study / Qualification	Telecommunications Technologies and Systems/ Engineer
1.7 Form of education	Full time
1.8 Subject code	TST-E35.00

2. Data about the subject

2.1 Subject name	Web Technologies and Databases						
2.2 Subject area	Theoretical area Methodological area Analytic area						
2.3 Course responsible	Assist. Prof. Cosmin STRILETCHI, Ph.D. Cosmin.Striletchi@com.utcluj.ro						
2.4 Teacher in charge with laboratory	Assist. Prof. Cosmin STRILETCHI, Ph.D. Cosmin.Striletchi@com.utcluj.ro Assist. Eusebiu JECAN, Ph.D.student Eusebiu.Jecan@com.utcluj.ro						
2.5 Year of study	III	2.6 Semester	5	2.7 Assessment	VP	2.8 Subject category	DS/ DI

3. Estimated total time

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

Distribution of time	hours
Manual, lecture material and notes, bibliography	35
Supplementary study in the library, online specialized platforms and in the field	10
Preparation for seminars / laboratories, homework, reports, portfolios and essays	18
Tutoring	3
Exams and tests	3
Other activities:	

3.7 Total hours of individual study	69
3.8 Total hours per semester	125
3.9 Number of credit points	5

4. Pre-requisites (where appropriate)

4.1 curriculum	Computer programming – Languages, Computer programming - Algorithms
4.2 competence	Object oriented programming in C++ and Java; fundamental network protocols;

5. Requirements (where appropriate)

5.1. for the course	amphitheater
5.2. for the laboratories	Cluj-Napoca

6. Specific competences

Professional competences	**C4. Design, implementation and operation of data, voice, video and multimedia services. This is based on the understanding and the application of fundamental concepts in telecommunications and transmission of information** C4.3 Explanation and interpretation of the main requirements and specific approach techniques for data, voice, video, multimedia transmissions **C5. Selecting, installing, configuring and operating fixed or mobile telecommunications equipment. Equipping a site with usual telecommunications networks** C5.2 Explanation and interpretation of the technologies and of fundamental protocols for integrated fixed and mobile communications systems
Transversal competences	N / A

7. Discipline objectives (as results from the key competences gained)

7.1 General objective	Developing practical skills for designing and implementing distributed web applications and databases
7.2 Specific objectives	1. Acquiring basic theoretical and practical knowledge related to database design, administration and the software environments that permit these operations 2. Learning and understanding the infrastructure of a distributed system that runs web applications 3. Learning the practical skills for developing web applications

8. Contents

8.1 Lecture (syllabus)	Teaching methods	Notes
1. Database fundamentals: introduction, database management systems; the stages of a database development; data models;	Exposition, whiteboard, slides	
2. The relational model: integrity constraints, domain constraints, tuple constraints		
3. The relational model: relationship constraints, moving from the concept to the logical model, maintaining the referential integrity;		
4. SQL: introduction, data types, instructions; SQL functions;		
5. The SELECT instruction; interrogations; junctions;		
6. Relational databases design: stages of implementation, normal forms;		
7. Configuring a computational system for implementing and running web applications; HTML fundamentals; CSS		

fundamentals;		
8. HTTP fundamentals; HTTP methods; web forms; URL programming;		
9. JavaScript fundamentals; variables, functions, classes (attributes and methods), exceptions, lambda expressions;		
10. Browser Object Model. Document Object Model. JavaScript events.		
11. The jQuery library		
12. AJAX. XMLHTTPRequest. JavaScript Object Notation (JSON)		
13. PHP fundamentals; variables, functions, classes (attributes and methods), objects;		
14. PHP libraries; work sessions; data persistence; encryption technologies;		

Bibliography

1. Robin Nixon, Learning PHP, MySQL, JavaScript, and CSS: A Step-by-Step Guide to Creating Dynamic Websites, O'Reilly Media, 2012, ISBN-10: 1449319262
2. Robert W. Sebesta, Programming the World Wide Web (7th Edition), Addison-Wesley, 2012, ISBN-10: 0132665816
3. Leon Shklar, Web Application Architecture: Principles, Protocols and Practices, Wiley, 2009, ISBN-10: 047051860X
4. Laird Dornin , Programming Android: Java Programming for the New Generation of Mobile Devices, Zigurd Mednieks, O'Reilly Media, 2012, ISBN-10: 1449316646
5. Erik Hellman, Android Programming: Pushing the Limits, Wiley, 2013, ISBN-10: 1118717376
6. Jon Raasch, JavaScript Programming: Pushing the Limits, Wiley, 2013, ISBN-10: 111852456X
7. Daniel-T Larosse, Exploration de données : Méthodes et modèles du data mining, Vuibert 2012, ISBN-10: 2311007416
8. Pop G.P., Baze de date, Editura Risoprint, Cluj-Napoca, 2013.
9. Felicia Ionescu, Baze de date relaționale și aplicații, Editura Tehnică, București, 2004.
10. M. Fotache, Proiectarea bazelor de date. Normalizare și postnormalizare. Implementări SQL și Oracle, Editura Polirom, București, 2005.

8.2 Laboratory	Teaching methods	Notes
1. Databases: a study case (entities, attributes, domains, links, Entity Relationship Diagrams)		
2. Database administration software. Database creation. Tables. Information insertion. Data editing. Relationships implementation.		
3. SQL: Data Definition Language		
4. SQL: Data Modelling Language (DML): simple interrogations on a single data source		
5. SQL: DML: interrogations on multiple data sources (joins)		
6. SQL: DML: nested interrogations		
7. Configuring the infrastructure for implementing and running web applications.		
8. HTML and CSS applications		
9. Java HTTP programming. URL applications. Web forms.		
10. JavaScript applications using variables, functions, classes, objects. exceptions; lambda expressions;		
11. BOM and DOM applications. JavaScript events.		
12. jQuery applications		

13. AJAX, XMLHTTPRequest, JSON		
14. PHP applications using variables, functions, classes, objects		

Bibliography

1. Cosmin Striletchi, The computer programming collective web portal (students registration, theoretical materials, practical examples and problems to be solved, work upload, similarity scores and automated evaluation), http://helios.utcluj.ro/lab/index.php

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

The discipline content and the acquired skills are in agreement with the expectations of the professional Competences acquired will be used in the following COR occupations (Electronics Engineer; Telecommunications Engineer; Electronics Design Engineer; System and Computer Design Engineer; Communications Design Engineer) or in the new occupations proposed to be included in COR (Sale Support Engineer; Multimedia Applications Developer; Network Engineer; Communications Systems Test Engineer; Project Manager; Traffic Engineer; Communications Systems Consultant).

10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade
10.4 Course	The level of acquired theoretical knowledge and practical skills	Evaluation test (theoretical questions)	T - 40%
10.5 Seminar/ Laboratory	The level of acquired knowledge and abilities	Laboratory evaluation (L), practical test (P)	L - 30% P - 30%
10.6 Minimum standard of performance			
$P \geqslant 5$, $T \geqslant 4$, $L \geqslant 4$ și $40\%T + 30\%L + 30\%P \geqslant 4.5$			

Date of filling in:	**Responsible**	**Title First name SURNAME**	**Signature**
20.06.2023	Course	Assist. Professor Cosmin STRILETCHI, Ph.D.	
	Applications	Assist. Professor Cosmin STRILETCHI, Ph.D.	
		Assist. Eusebiu JECAN, Ph.D.student	

Date of approval in the Council of the Communications Department 11.07.2023	Head of Communications Department Prof. Virgil DOBROTA, Ph.D.
Date of approval in the Council of the Faculty of Electronics, Telecommunications and Information Technology 12.07.2023	Dean Prof. Ovidiu POP, Ph.D.