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 STRILEȚCHI, Ph.D cosmin.striletchi@com.utcluj.ro						
2.4 Teacher in charge with seminar / laboratory / project	Assist.Prof. Cosmin STRILEȚCHI, Ph.D cosmin.striletchi@com.utcluj.ro Asist. Eusebiu JECAN, PhD student, eusebiu.jecan@com.utcluj.ro						
2.5 Year of study	III	2.6 Semester	1	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

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, Teams, Helios (our own on-line platform)
5.2. for the seminars / laboratories / projects	Lab. 212, Cluj-Napoca; all the hardware and software requirements are met; Teams, Helios (our own on-line platform)

6. Specific competences

Professional competences	**C3. Base knowledge, concepts and methods referring the computational systems architecture, microprocessors, microcontrollers, languages and programming techniques** C3.3 Solving practical problems that involve data structures and algorithms, programming and microcontrollers or microprocessors usage C3.4 Developing programs in a generic / specific programming language strarting from specifications and finishing with execution, debugging, results interpretation C3.5 Developing projects that involve hardware and software components **C4. Conceiving, implementing and operating data, voice, video and multimedia services based on understanding and applying fundamental communications and data transmission concepts** C4.3 Solving practical problems using multimedia techniques **C5. Selecting, installing, configuring and using mobile or fixed telecommunications equipments; equipping specific locations with telecommunications networks;** C5.2 Understanding and interpreting the fundamental protocols and technologies for integrated mobile or fixed communications systems
Cross 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
Database fundamentals: introduction, database management systems; the stages of a database development; data models;	Exposition, whiteboard, slides, video conference tools,	
The relational model: integrity constraints, domain constraints, tuple constraints		

The relational model: relationship constraints, moving from the concept to the logical model, maintaining the referential integrity;	screen sharing, our own software platform	
SQL: introduction, data types, instructions; SQL functions;		
The SELECT instruction; interrogations; junctions;		
Relational databases design: stages of implementation, normal forms;		
Configuring a computational system for implementing and running web applications; HTML fundamentals; CSS fundamentals;		
HTTP fundamentals; HTTP methods; web forms; URL programming;		
JavaScript fundamentals; variables, functions, classes (attributes and methods), exceptions, lambda expressions;		
Browser Object Model. Document Object Model. JavaScript events.		
The jQuery library		
AJAX. XMLHTTPRequest. JavaScript Object Notation (JSON)		
PHP fundamentals; variables, functions, classes (attributes and methods), objects;		
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
1. Robert W. Sebesta, Programming the World Wide Web (7th Edition), Addison-Wesley, 2012, ISBN-10: 0132665816
2. Leon Shklar, Web Application Architecture: Principles, Protocols and Practices, Wiley, 2009, ISBN-10: 047051860X
3. Laird Dornin , Programming Android: Java Programming for the New Generation of Mobile Devices, Zigurd Mednieks, O'Reilly Media, 2012, ISBN-10: 1449316646
4. Erik Hellman, Android Programming: Pushing the Limits, Wiley, 2013, ISBN-10: 1118717376
5. Jon Raasch, JavaScript Programming: Pushing the Limits, Wiley, 2013, ISBN-10: 111852456X
6. Daniel-T Larosse, Exploration de données : Méthodes et modèles du data mining, Vuibert 2012, ISBN-10: 2311007416
7. Pop G.P., Baze de date, Editura Risoprint, Cluj-Napoca, 2013.
8. Felicia Ionescu, Baze de Date Relaționale și Aplicații, Editura Tehnică, București, 2004.
9. M. Fotache, Proiectarea bazelor de date. Normalizare și postnormalizare. Implementări SQL și Oracle, Editura Polirom, București, 2005.

Electronic bibliography

1. Cosmin Strilețchi, 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

8.2 Seminar / laboratory / project	Teaching methods	Notes
Databases: a study case (entities, attributes, domains, links, Entity Relationship Diagrams)	Exposition, whiteboard, slides, video conference tools, screen sharing, Helios - our own software platform	
Database administration software. Database creation. Tables. Information insertion. Data editing. Relationships implementation.		
SQL: Data Definition Language		

SQL: Data Modelling Language (DML): simple interrogations on a single data source		
SQL: DML: interrogations on multiple data sources (joins)		
SQL: DML: nested interrogations		
Configuring the infrastructure for implementing and running web applications.		
HTML and CSS applications		
Java HTTP programming. URL applications. Web forms.		
JavaScript applications using variables, functions, classes, objects. exceptions; lambda expressions;		
BOM and DOM applications. JavaScript events.		
jQuery applications		
AJAX, XMLHTTPRequest, JSON		
PHP applications using variables, functions, classes, objects		

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
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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 organizations and the employers in the field, where the students carry out the internship stages and/or occupy a job (in the field of software development, full stack developer, database analyst, project manager), and the expectations of the national organization for quality assurance (ARACIS).

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 - 34%

10.5 Seminar/ Laboratory	The level of acquired knowledge and abilities	Laboratory evaluation (L), practical test (P)	L - 33% P - 33%
10.6 Minimum standard of performance			
Minimal knowledge: ✓ the basic concepts related to web applications programming ✓ the basic syntax for running queries in a relational database environment *Minimum competencies:* ✓ to develop and run simple web applications ✓ to execute simple database queries *Quantitative requirement:* ✓ performing the weekly assigned individual tasks P ≥ 5, T ≥ 4, L ≥ 4 și 34%T + 33%L + 33%P ≥ 4.5			

Date of filling in:	Responsible	Title First name SURNAME	Signature
28.09.2020	Course	Assist.Prof. Cosmin STRILEȚCHI	
	Applications	Assist.Prof. Cosmin STRILEȚCHI	
		Asist. Eusebiu JECAN	

Date of approval in the Department of Communications 30.09.2020	Head of Communications Department Prof. Virgil DOBROTA, Ph.D.
Date of approval in the Council of Faculty of Electronics, Telecommunications and Information Technology 30.09.2020	Dean Prof. Gabriel OLTEAN, Ph.D.