



FACULTY

OF CONTEMPORARY SCIENCES AND TECHNOLOGIES

STUDY PROGRAMME FOR POSTGRADUATE STUDIES

(Master of Science)

NAME OF THE PROGRAMME:

DATABASE MANAGEMENT STUDIES

INTRODUCTION

The Masters programme in Computer Sciences is designed to provide students with opportunities to advance their knowledge in specific Computer Science fields, to direct themselves to the research field, as well as learn to apply the acquired theoretical and technical skills both in the industry and the business sector.

The proposed fields are in line with the ICT-market needs as a whole, with a special emphasis on the local and regional market needs.

The programme nurtures creative thinking and innovative approach to solving problems through solid theoretical background and new technologies.

The Masters Studies programme in Database Management offers two subspecializations: subspecialization in Intelligent Systems and subspecialization in Net-centric computing.

The first semester is common, and the students are required to choose one of the abovementioned subspecializations in the second semester and comply to the selected subspecialist line until the end.

Modifications and supplements of study programmes

Faculty of Contemporary Sciences and Technologies	
1. Institution/ Title issuing body	SEE University
2. Academic Institution	SEE University
3. Location of Instruction	SEEU Campus (Tetovo)
4. Programme accredited by	Accreditation Board
5. Final scholarly degree	M.Sc. in Computer Sciences
6. Programme	Software Engineering
7. Completion date/revision	September, 2007
8. Student group	2008/2009 Academic Year Generation
<p>9. Programme objectives</p> <ul style="list-style-type: none"> • To provide students with opportunities to expand their analytical and research capacities. • To equip students for design, development and management of complex information systems in the industry and the business community. • To provide students with background for further studies at doctoral and research level. • To equip candidates for project work, both individual and group, which, by nature, may be scientific- research projects, developmental projects or internship. • To understand the role of information management in different companies/organizations. 	

Modifications and supplements of study programmes

Learning outcomes	
Acquired knowledge	Lectures/instruction, or teaching methods and assessment strategies used for acquiring and presenting of the outcomes
<p>A. Acquired knowledge and comprehension in:</p> <ol style="list-style-type: none"> 1. Databases, their design, system aspects and optimization. 2. Data mining, data storage, distributed Databases, object and multimedia databases. 3. The latest databases trends, such as Web and XML- technologies and modern information collection. 4. Integration of the latest technologies, such as the intelligent systems or distributed architecture in the traditional information systems and their use for making better decisions within the organizations. Processes. 5. General skills, such as analytical and critical thinking, team work and work in multicultural environments, planning and organizing etc. 	<p>Lectures/Instruction</p> <p>Assessment</p> <p>Within the course programme, assessment may be realized through the following breakdown:</p> <ul style="list-style-type: none"> •Practical work realized successfully •Consultations •Realized projects •Seminar papers •Written exams etc.

Study programme structure, admission requirements, levels, modules, credits and awards

Instruction is performed in a full-time form. The programme courses are divided into obligatory and electives. The courses are divided into semestral units, each course is worth 6 credits, which is 180 classes of lecture duration. 60 credits are gained per year, which is about 1800 classes annually.

The programme draft in Masters Studies is organized within a duration of four semesters, so that it is also suitable for the candidates who are completing undergraduate three-year programmes.

Students are required to acquire all the credits according to the following plan-programme. Participation in lectures is obligatory and is a condition for passing the course. Each course has to be completed by satisfying the requirements set in the course syllabus.

At the end of 4 (fourth) semester students are also required to submit and defend a Masters Thesis.

CURRICULUM FOR POSTGRADUATE STUDIES IN DATABASE MANAGEMENT

Semester 1	Credits	W/S	Lectures:	Tutorials:	Overall classes:	Group size
Research Methodology	6	W	15	30	180	50/20-30
Advanced Databases	6	W	15	30	180	50/20-30
Database Analysis and Design	6	W	15	30	180	50/20-30
Seminar Paper	6	W	15	30	180	50/20-30
Elective	6	W	15	30	180	50/20-30
Total	30				900	

Subspecialization: Intelligent Systems

Semester 2	Credits	W/S	Lectures:	Tutorials:	Overall classes:	Group size
Artificial Intelligence	6	S	15	30	180	50/20-30
Laboratory Course in Database Programming	6	S	15	30	180	50/20-30
Elective 1	6	S	15	30	180	50/20-30
Elective 2	6	S	15	30	180	50/20-30
Elective 3	6	S	15	30	180	50/20-30
Total	30				900	

Elective Courses:

1. Planning Systems
2. Machine Learning
3. Natural Language Processing
4. Data Mining
5. Database Algorithms
6. Data Storage etc

Subspecialization: Net-centric Computing

Semester 2	Credits	W/S	Lectures:	Tutorials:	Overall classes:	Group size
Distributed Systems	6	S	15	30	180	50/20-30
Laboratory Course in Database Programming	6	S	15	30	180	50/20-30
Elective 1	6	S	15	30	180	50/20-30
Elective 2	6	S	15	30	180	50/20-30
Elective 3	6	S	15	30	180	50/20-30
Total	30				900	

Elective Courses:

1. Network Management
2. Network Security
3. Web-Programming
4. Wireless and Mobile Computing
5. Database Algorithms
6. Database Storage etc.

Subspecialization: Intelligent Systems

Semester 3	Credits	W/S	Lectures:	Tutorials:	Overall classes:	Group size
Information Retrieval	6	W	15	30	180	50/20-30
XML and Databases	6	W	15	30	180	50/20-30
Team Project	6	W	15	30	180	50/20-30
Elective 1	6	W	15	30	180	50/20-30
Elective 2	6	W	15	30	180	50/20-30
Total	30				900	

Elective Courses:

1. Multiple agent systems
2. Robotics
3. Neuron Networks
4. Expert Systems
5. Distributed and Object Databases
6. Multimedia Information Systems
7. Information Integration etc

Subspecialization: Net-centric Computing

Semester 3	Credits	W/S	Lectures:	Tutorials:	Overall classes:	Group size
Information Retrieval	6	W	15	30	180	50/20-30
XML and Databases	6	W	15	30	180	50/20-30
Team Project	6	W	15	30	180	50/20-30
Elective 1	6	W	15	30	180	50/20-30
Elective 2	6	W	15	30	180	50/20-30
Total	30				900	

Elective Courses:

1. Cluster Computing
2. Company Networking
3. Mobile Programming
4. Distributed and Object Databases
5. Web-Services
6. Multimedia Information Systems
7. Information Integration etc

Semester 4	Credits	W/S	Lectures:	Tutorials:	Overall classes:	Group size
Masters Thesis Writing	30				900	1
Total	30				900	

COURSE DESCRIPTION

SEMESTER 1

Research Methodology

This course covers different research methodologies in Computer Sciences and their combination and research assessment criteria in Computer Sciences. The nature of the research in Computer Sciences. Practical pieces of advice for conducting research, as well as different research skills: reading, examining and assessing, as well as designing a research project. Undertaking practical research tasks, preparing verbal and written presentations, research reports and writing etc.

Advanced Databases

Advanced topics from the database systems field, such as data saving and indexing (file organizing, indexes and index structures), query evaluation (sorting, evaluating and optimization of relational queries), managing transactions (transactions, competition control, crash recovery procedures), introduction to parallel and distributed databases, Internet databases, object databases.

Databases Design and Analysis

The course provides introduction to the history of databases and the development of the theory and database modeling; basics of database systems, components and architecture, database models such as hierarchical, network, relational, object-oriented and semantic model, theory of database design and processes of data manipulation with relational algebra and calculus, theories such as Codd's, physical and logical designing, normalization, integrity and security, comparing methods and modeling tools, and normalized database design.

SEMESTER 2

Subspecialization: Intelligent Systems

Artificial Intelligence

The course provides more thorough research of the intelligent agents from different perspectives and different complexity, such as their analysis, design and programming. The topic covered include: knowledge and reasoning, knowledge representation, planning algorithms, search algorithms, expert systems, machine learning, neural networks, statistical learning, ant colony optimization, CVM, genetic algorithms, swarm intelligence, robotics.

Subspecialization: Net-centric Computing

Distributed Systems

The course provides more thorough research of the distributed system principles in general and the separate distributed operating systems. The topics covered include processes and threads, concurrent programming, distributed interprocess communication, distributed processes, distributed virtual memory, distributed system files, distributed system security, distributed middleware and applications such as Web and peer-to-peer systems. Some principles of multiprocessor operating systems will be included. A short overview of advanced topics such as multimedia operating systems, real-time operating systems and mobile systems will be also presented.

SEMESTER 3

Subspecialization: Intelligent Systems and Net-centric Computing

Information Retrieval

The topics covered include: information retrieval systems, efficient indexing, retrieval models (language modeling, logical models; vector areas and hidden sentence indexing, probabilistic information retrieval), information retrieval rank and evaluation, text operations, clustering and classifying methods. Web browsers, including crawling and indexing, link-based algorithms and web-metadata. Other possible topics: collaborative filtering and recommendation systems, text-oriented XML indexing, information retrieval indexes etc.

XML and Databases

The initial topic list covers (mainly based on the research student interest): XML data model, languages; DTD; XML Cchema; XPath; navigation and XML addressing language; XML query language: Xquery; Transformation language: XCLT; Linking language: XLink and Xpointer; XML databases: CQL/XML; XML applications: DOM/CAX model, C/C++/Java/PL-CQL APIs and XML. Overview: current trends and future perspectives (Web-services, Semantic Web, GML etc.)

SEMESTER 4

Completion and defense of the Masters Thesis.