

# **Profile of Graduate of the Master Program in Computer Sciences at CST**

## **PURPOSE**

The Master Program in Computer Sciences at CST - addresses the skills to be earned, the knowledge to be acquired, and the competences to be achieved in Computer Sciences in order to answer to the needs of the Global ICT market with special emphasize to the SEE regional needs and Macedonian local perspectives of building Common European educational, working and research areas.

Given the above defined market requirements and the own resources, the vision and the mission of the CST Faculty, the program will offer two kinds of orientation in the specialization: Applied and Research. By choosing of concentration areas of specialization these are translated in three applied and one research program. In addition CST Faculty will offer also a Master degree program in Communication Sciences and Technologies.

In terms of employability the local and regional conditions urges the improvement of the human ICT capacities of the country and the region. From one side these capacities should address the needs of the emerging ICT industry, from the other should build the needed ICT capacity on all levels for the EU integration process.

## **Program and Curriculum Description - Master Degree in Computer Sciences**

The master Graduate Program is worth 90 Master ECST credits equivalent courses to be realized in presumable time of three semesters (30 credits each). The program is composed of core courses, elective courses, special studies (practical or research activities), and thesis work.

This program is build on the basis of 240 credits undergraduate ECTS making the total of 330 credits total to gain the MSc degree.

The candidate shapes his program in the prospective of the four mentioned profiles, through a selection of elective courses and thesis subject i.e. thesis advisor.

One of the core courses is common for all SEE University offered Master Programs. This course will be on Research, Communications and Teamwork, Writing skills, and Presentation skills.

The defined objectives and skills will be achieved throw unique Master of Science degree program composed around four concentrated areas which realization will be described in the following:

### **Core courses for the Master Degree in Computer Sciences program**

This set of courses will prepare the candidates to meet the present and future technology challenges, with the critical thinking skills necessary to perform creatively, ethically, and effectively in a wide range of ICT contexts.

The candidate will learn to asses the information needs of an organization or a research plan, implement leading edge technologies, and discover innovative solutions to business and research programs. The Master Program is designed with same first and third semester for all profiles, while the second semester changes and gives the students the liberty to shape their studies, and choose their profile.

This structure is very suitable for easy shifting to 120 credits Master Degree program (two academic years) by extending the second semester Master studies from 30 to 60 credits (two semesters) program. This will be done by selecting the both courses separated with slash in the actual program of the second semester.

<b>Semester 1</b>	<ul style="list-style-type: none"><li>● <b>Research Methodology ( * )</b></li><li>● <b>Programming Techniques and Technologies</b></li><li>● <b>Advances in Data Structures and Algorithms</b></li><li>● <b>Web Development and Networking</b></li></ul>
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<b>Semester 2</b>	<ul style="list-style-type: none"> <li>• Human-Computer Interface / Usability and Testing</li> <li>• Software Engineering / Project Management</li> <li>• System Analyses and Design / Corporate Development</li> <li>• Artificial Intelligence / Machine Learning</li> </ul>
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<b>Semester 3</b>	<ul style="list-style-type: none"> <li>• Simulation and Animation of ICT Systems - (10)</li> <li>• Master Thesis (Writing and Presentation) - (20)</li> </ul>
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### **Instructional Needs**

- In the near term we anticipate courses to be taught by available CST Faculty, visiting professors from Indiana University and other partner Universities and by using the e-Learning environments.
- On the long term we anticipate courses to be taught by the SEEU-CST teaching staff.

Available Full Time and Part Time PhD holders in Computer Sciences:

Dr. Vladimir Radevski (*Artificial Intelligence, Machine Learning, Image Processing, Computer Graphics*)

Dr. Zamir Dika (*Web Development, Multimedia Techniques and Technologies, The Web, E-Technologies*)

Dr. Agni Dika (*Data Structures and Algorithms*)

Dr. Abdulah Zejnulahu (*Optimization, Game Theory*)

Dr. Ilir Spahiu (*Optimisation, Game Theory*)

Dr. Margita Kon-Popovska (*Information Systems and Retrieval, Distributed Databases, Computer Graphics, Virtual Reality*)

Dr. Aksentie Grnarov (*Web development and Networking, Multimedia Computer Networks, Enterprise Network design and Administration, Network Security and Cryptography*)

Dr. Biljana Percinkova (*Artificial Intelligence, Algorithms and Intelligence, Game Theory, System Analyses and Design*)

Available Full Time MSc holders in Computer Sciences:

MSc. Arbana Kadriu (*Programming Techniques and Technologies, Data Structures and algorithms, Computational Linguistics, Machine Learning*)

MSc. Bekim Fetaji (*Software Engineering, System analysis and Design, Human-Computer interface, E-Technologies, Multimedia Development Techniques*)

Prospective Full time staff:

MSc. Arianit Kurti (*Distributed Operating systems, Data Structures and Algorithms, Programming Techniques and Technologies, Strategic Information Management*)

UP to 50 % percent of the program will be covered by E-Learning delivery from partner Universities, visiting Professors, and in the framework of International research and cooperation. Midterm perspectives promise availability of three more MSc and at least one PhD holder from own resources. The University is considering the recruitment of additional PhD holders for the proposed program (at least two full time), and at least four MSc holders. Some of these arrangements will be market arranged.

For the Communication Sciences and Technologies Master Degree the Communication Sciences Courses will be offered by Communication Sciences teaching staff.

### **Infrastructure**

The Master Program is designed to fit in research and application capacities and development plans of CST Faculty. The research interest areas include new media and web development and the starting facilities are in place in CST. The Multimedia research and application laboratory is under construction and is planed to be operational in fall 2005. It is however important to underline that further investments should be strongly considered on the side of the specialist equipment, space and computing power and tools.

### **Admission Requirements**

The perspective candidate should accomplish all general Master Program enrolment requirements on University level and have:

- 1) Valuable GPA greater then 8.5
- 2) Excellent English proficiency (TOEFL 550; IELTS 6.0)
- 3) Batchelor Degree in Computer Engineering, Computer Sciences, Informatics and Communication Sciences and technologies (240 credits)
- 4) Approval from the Admission committee (Students with degrees in other disciplines may be required to take undergraduate prerequisites as part of their program).
- 5) \* For the Communication Sciences

### **Implications for the I<sup>st</sup> cycle:**

The 90 credits Master degree is offered for an undergraduate with 240 ECTS credits in his/her pre-Master studies. However, the structure of the Master degree programs allow efficient shift from 3 semesters to 4 semesters program. The four semester Master degree program will be proposed for the students with 180 ECTS undergraduate credits.

The actual 240 ECTS undergraduate program can be propose in the future as a three years program through the following changes:

- Replace the actual first semester with preparatory courses and/or strong entry criteria.

- Reduce the non-specialization courses from second semester.
- Start the undergraduate studies from the actual third semester, to complete them with 180 credits.

The implication for the Master degree program will be:

- Do both courses per line for the second semester (extend the actual Master Degree semester in second and third semester) thus obtaining 30 semesters longer curriculum.