

## MA IN EMBEDDED SYSTEM (TAUGHT IN ENGLISH)

### **Brief presentation of the program:**

The program is practically oriented in embedded computer systems. Successful design of embedded systems implies a systematic approach which in turn requires educational orientation other than that in traditional computer science. Content and structure of courses reflect the latest trends in the design and implementation of embedded systems. The program includes two courses in software architecture, developed by the Institute for Software Research at the University of Carnegie Mellon University.

Training is conducted entirely in English.

The program offers a preparatory module for applicants from other areas.

### **Major and professional qualification:**

**Subject Module:** Embedded Systems (in English)

**Qualification:** Master in Embedded Systems

**International mobility:** Contacts have been established with the Technical University of Denmark, University of Southern Denmark, University of Patras, Greece and the Royal Institute of Technology (KTH), Sweden.

### **Competence of Graduates:**

Graduates of the program have knowledge of computer systems and their application as a constituent of other technical systems. They are specialists in the design, development, implementation and maintenance of embedded systems.

**Graduation:** The educational graduate degree is completed with a master thesis or state examination upon obtaining the necessary number of credits. The conditions for graduation are set out in the "Standards for completion of Bachelor or Master and qualification degree in NBU."

**Profession and possible positions:** Graduates can work in institutes, laboratories and companies which develop embedded systems.

**Department:** Informatics

### **List of courses and program structure**

#### **First year**

##### *Basic courses , first semester*

ESMM110 Embedded computers, Prof. Zdravko Karakehayov, D.techn.sc. - 30 hours, 3 credits

ESMM120 Design of Digital Systems, Prof. Zdravko Karakehayov, D.techn.sc. - 30 hours, 3 credits

ESMM130 hardware platforms, Prof. Racho Ivanov, Ph.D -- 30 hours, 3 credits

ESMM131 Laboratory work on hardware platforms, Prof. Racho Ivanov, Ph.D - 30 hours, 3 credits

ESMM140 Software for Embedded Systems, Prof. Zdravko Karakehayov, D.techn.sc. - 30 hours, 3 credits

ESMM150 Real-time systems, Assoc.Prof Lilyan Nikolov, Ph.D - 30 hours, 3 credits

ESMM160 Algorithms for Embedded Systems – Assoc. Prof. Panaiot Iliev, Ph.D - 30 hours, 3 credits

##### *Extracurricular forms of training (credit courses)*

ESMM112 Individual course work: Embedded computers, Prof. Zdravko Karakehayov, D.techn.sc. - 30 hours, 3 credits

ESMM122 Project: Digital Systems, Prof. Zdravko Karakehayov, D.techn.sc. - 30 hours, 3 credits

ESMM132 Project: Hardware platforms, Prof. Racho Ivanov, Ph.D - 30 hours, 3 credits

ESMM142 Project: Software for Embedded Systems, Prof. Zdravko Karakehayov, D.techn.sc. - 30 hours, 3 credits

ESMM152 Project: real time systems- Assoc.Prof Lilyan Nikolov, Ph.D - 30 hours, 3 credits

ESMM162 Individual work: Algorithms for Embedded Systems, – Assoc. Prof. Panaiot Iliev, Ph.D - 30 hours, 3 credits

## **First year**

### *Basic courses , second semester*

ESMM220 Design of Embedded Systems. Prof. Zdravko Karakehayov, D.techn.sc. - 30 hours, 3 credits

ESMM230 Management Theory, corresp.member Petko Petkov, D.sc. - 30 hours, 3 credits

ESMM240 Sensor networks, Prof. Zdravko Karakehayov, D.techn.sc. - 30 hours, 3 credits

ESMM250 Cognitive Systems, Assoc.Prof. Morris Greenberg ,Ph.D - 30 hours, 3 credits

ESMM260 Systems design with low power consumption, Prof. Zdravko Karakehayov, D.techn.sc. - 30 hours, 3 credits

ESMM270 Algorithms for control, Assist.Prof. Snezhana Yordanova- 30 hours, 3 credits

ESMM290 Architecture of Software Systems I, Nikolay Milovanov, Ph.D - 30 hours, 3 credits

### *Extracurricular forms of training (credit courses)*

ESMM222 Project: Embedded systems, Prof. Zdravko Karakehayov, D.techn.sc. - 30 hours, 3 credits

ESMM232 Individual course work: Management Theory, Assist. Prof. Andrey Yonchev, Ph.D - 30 hours, 3 credits

ESMM242 Individual course work: Sensor networks, Prof. Zdravko Karakehayov, D.techn.sc. - 30 hours, 3 credits

ESMM252 Individual course work: Cognitive Systems, Assoc.Prof. Morris Greenberg ,Ph.D - 30 hours, 3 credits

ESMM262 Project: Systems with low power consumption, Prof. Zdravko Karakehayov, D.techn.sc. - 30 hours, 3 credits

ESMM272 Individual course work: Algorithms for control, Assist.Prof. Snezhana Yordanova- 30 hours, 3 credits

ESMM292 Project: Architecture of Software Systems I , Nikolay Milovanov, Ph.D - 30 hours, 3 credits

## **Second year**

### *Basic courses , first semester*

ESMM310 Joint design of hardware and software, Prof. Zdravko Karakehayov, D.techn.sc. - 30 hours, 3 credits

ESMM320 Re-programmable systems, Assoc. Prof. Konstantin Pavlinov and Yasen Gorbunov - 30 hours, 3 credits

ESMM330 Security of embedded systems, Prof. Zdravko Karakehayov, D.techn.sc. - 30 hours, 3 credits

ESMM350 Digital Signal Processing, Assoc.Prof. Borislav Donevski, D.Sc. -30 hours, 3 credits

ESMM370 Embedded systems with high reliability, Assoc.Prof Asen Krumov -30 hours, 3 credits

ESMM380 Distribution systems and computer communication, Prof. Todor Stoilov, D.Sc.-30 hours, 3 credits

ESMM390 Architecture of software systems II, Nikolay Milanov, Ph.D -30 hours, 3 credits

### *Extracurricular forms of training (credit courses)*

ESMM302 Internship, , Prof. Zdravko Karakehayov, D.techn.sc. - 150 hours, 15 credits