Discipline	EMBEDDED SYSTEMS code: 42	**winter semester**
Specialty	Computer Science and Technologies	
ECTS credits: 7	Form of assessment: exam	
Lecturer	Assoc. Prof. Yulka Petkova, PhD Room 207-3 E Phone: +359 52 383 403 E-mail: yulka.petkova@tu-varna.bg	
Department	Computer Science and Engineering	
Faculty	Faculty of Computing and Automation	

Learning objectives:

The aim of the course is to give the students knowledge in the design and use of specialized computer systems (Embedded Systems - ES). The principles of ES organization are discussed. The main sources of information (input data) for ES - sensors, and the main process control systems are studied. The standard hardware and software tools of industrial controllers from industry-leading companies and the standard interfaces between them are also considered. Issues related to the design of the ES are also included. The devices built into the ES are being studied, as well as development tools designed for application software design, setup and testing, and documenting the project.

CONTENTS:

Training Area	Hours lectures	Hours seminar exercises
General principles of the organization of specialized computer systems (Embedded Systems - ES). Classification and application areas.	2	2
Connection of the ES with the environment. Sensors and Sensor Devices. Output mechanisms to control the processes in the facility.	6	4
Standard instrumentation for building a ES Industrial controllers. Twido based configuration. Serial interfaces.	6	6
Inventory built into ES. One-chip controllers, keyboard, LED, LCD indication, real-time clock. Non-volatile memories.	6	4
Standard programming tools for building Programmable Logic Controller programmes - TwidoSoft, TwidoSuite. Types of commands. Ways to describe algorithms for PLC.	4	10
Construction of ES for various objects' control. Exemplary variants of technical, program and apparatus solutions.	6	4
TOTAL: 60 h	**30**	**30**