DigiJED

Digital Education with Joined Efforts

Ukraine digital:

Ensuring study success in times of crisis

01.09.2023 - 31.12.2023

digijed@gmail.com

Partners

Hochschule Anhalt
University of Applied Sciences

Prof. Dr. Eduard Siemens,
Department of Electrical, Mechanical and Industrial Engineering

NTUU “Igor Sikorsky Kyiv Polytechnic Institute”

Prof. Dr. Nataliia Kussul
Head of the Department of Mathematical Modelling and Data Analysis

Prof. Dr. Mariia Skulysh
Head of the Department of Information Technologies in Telecommunications

Odessa National Polytechnic University

Prof. Dr. Svitlana Antoshchuk
Director of Institute of Computer System

Oles Honchar Dnipro National University

Dr. Mykhailo Derhachov
Dean of Faculty of Physics, Electronics and Computer Systems

Kharkiv National University of Radio Electronics

Prof. Dr. Oleksandr Lemeshko,
V.V. Popovskyy Department of Infocommunication Engineering

General Information

Main Idea

Creation of a didactic concept of collaborative digital learning in the field of information and communication technologies (2-3 training modules during the winter semester)

Target audience

- Technical universities or technical faculties of universities in the regions of Ukraine heavily affected by the war;
- 3rd and 4th-year bachelor's and 1st-year master's students

Cooperation

- Ukrainian teachers, several of whom already work at Anhalt University of Applied Sciences, or some of whom teach from Ukraine;
- German and North Macedonian teachers.

Main Feature

Training modules include not only ***courses of classical lectures*** through the Zoom platform, but also the performance of ***laboratory experiments***

Distributed Systems & Network Programming

Prof. Dr. Marija Kalendar
Prof. Dr. Marko Porjazoski
(Ss. Cyril and Methodius University)

Academic year/semester: IV/8

English

4 ECTS

120 hours

Exam

Requisites

Introduction to the concepts of distributed systems and communication between remote processes, distributed architectures, and distributed file systems. TCP and UDP socket programming and implementation of network applications in Python.

Introduction. Features of distributed systems. DS models. Concepts of communication between remote processes. Working with network interfaces. IPv4. IPv6. Sockets. Introduction to Socket Concepts. Types of sockets. TCP and UDP sockets. Block diagram of TCP and UDP socket calls. Python Socket Module. Client/server programming. TCP and UDP client and server. DNS system in network programming. Multiplexing of Socket I/O. Application level libraries to work with the Web, e-mail, ftp. Working with HTTP protocol: httplib () and urllib (). Working with e-mail protocols and FTP. Working with SMTP, POP, and IMAP protocols. Using web site APIs. Security and network programming. Security with SSL and TLS. Concepts of remote invocation. Request-reply protocols. Publish and subscribe systems. Remote Procedure Calls (RPC). Remote Method Invocation (RMI).

ICT Security

Dr Oleksandr Lemeshko
(Kharkiv National University of Radio Electronics)

Academic year/semester: III/6

Ukrainian

4 ECTS

120 hours

Credit

Requisites

Learning the basics of ICT, network vulnerabilities and weaknesses, risks and ICT protection methods and tools. This course will guide through theoretical and practical skills to design, implement, and support security for devices and data in ICT networks. Understand the importance of ICT security in the modern technological world.

Introduction to basic ICT technology. Network threats, vulnerabilities, and risks (CVSS). Security LAN&WAN. Access Control Lists and Remote Access Security. DHCP, DNS, ARP. Virtual Private Network. VLAN configuration. Routing security: Attacks and protection. Understanding network scanning concepts. Network traffic analysis / log files monitoring (Wireshark, nmap, network sniffers). Discover the network's hosts, IP addresses, and open ports. Vulnerability Scanning. Firewall, Intrusion Detection/Prevention Systems (Snort, Suricata). Dos/DDoS. Cyber Kill Chain framework (Reconnaissance). MITRE ATT&CK.

Machine Learning

PhD Hanna Yailymova
(National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute")

Academic year/semester: IV/7

Ukrainian

4 ECTS

120 hours

Credit

Requisites

Learning the basics methods and technologies of machine learning. Programming of neural network algorithms taking into account modern trends in the development of this industry in the era of digitalization and Industry 4.0, the ability to solve real engineering and scientific and technical problems of varying complexity using intelligent information technologies.

Introduction to deep learning. Image recognition tasks. Biological neuron. Neuron model in classification problems. Decision support system. Machine learning problems (classification, regression and clustering). Perceptron & activation functions. Multilayer neural network. Neural network architecture. SoftMax activation function. Deep neural networks. Convolutional neural networks. Components of a convolutional neural network. Accuracy metrics in classification problems. The task of validation is to assess the accuracy of classification. Confusion matrix. Applied tasks of satellite monitoring based on deep learning methods.

Creating Mobile apps with Android

Dr. Mykola Hodovychenko,
(Odessa Polytechnic National University)

Academic year/semester: III/6

English/Ukrainian

4 ECTS

120 hours

Credit

Requisites

Computing resources for high-loaded services

Prof. Dr. Mariia Skulysh,
(Igor Sikorsky Kyiv Polytechnic Institute)

Academic year/semester: III/6

English

2 ECTS

60 hours

Credit

Requisites

- Hybrid computation and communication environment for:
  5G,
  IoT networks
- High-Loaded Services
- Big data Management
- Infrastructure organization. Containerization and virtualization
- Systems for monitoring
- Software configuration management tools
- Some mathematical solutions for improving
- QoS and energy efficient improving

IoT and Embedded System Programming

M. Eng. Simeon Trendov
(Anhalt University of Applied Sciences)

Academic year/semester: IV/8

English

2 ECTS

60 hours

Final Project Work

Requisites

Introduction to the concepts of the Internet of Things (IoT) and Embedded Systems, as well as Low Power Wide Area Network (LPWAN) Technologies. Learning to program in C++ and getting familiar with an Arduino UNO.

Introduction. Defining and understanding the terms Internet of Things (IoT) and Embedded Systems. IoT trends. Risks, Privacy and Security. Low Power Wide Area Network (LPWAN) Technologies. Designing an Embedded System. C++ Programming. Getting familiar with an Arduino UNO. Creating first Arduino UNO project. Creating and Programming Embedded Systems. Connecting Sensors and Actuators. Programming Smart Devices. Getting familiar with LoRaWAN, SigFox, Weightless, NB-IoT. Establishing LoRaWAN communication between two devices. Network Parameters.

Result

DigiJED

Bundesministerium für Bildung und Forschung

CERTIFICATE OF EXELLENCE

PROUDLY PRESENTED TO

Name Surname

in recognition of his successful completion of the course

Course Name

as part of the **DigiJED: Digital Education with Joined Efforts** project within the **Ukraine digital: Ensuring study success in times of crisis** program

September 22, 2022 - December 29, 2022

120 Hours	**4 ECTS**	**80 (good)**	**DJOS/202222**
Duration of Course	ECTS	Grade	Certificate No.

DAAD
Deutscher Akademischer Austausch Dienst
German Academic Exchange Service

Prof. Dr. Eduard Siemens
Principal Investigator
Anhalt University of Applied Sciences

03.01.2023
Issue Date

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