2024/25 Spring Semester

The availability of the courses depends on the registered number of students (minimum 5). Even if a course cannot be launched, students will be able to complete it in the form of a project work with regular consultation possibilities with their supervisors.

Courses in English

Computer Architecture (I)

Number of Credits: 4
Lecturers: Dr. István Vári-Kakas
Requirement: written exam

Purpose of the subject:
Computer Architecture is a basic subject worldwide for the students in Computer Engineering and Information Technology. Our course is based on the most recent edition of William Stallings's textbook, which covers as well the evolution and the actual implementations of the related concepts. The main goal of the course is to give a solid understanding of the organization of computers from a hardware perspective along with a lot of practical examples. Most of the examples are given from the Intel and ARM families, the first being widely used in personal computers and the second in embedded applications like cell phones, iPods and remote controls.
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Topics:
The topics covered throughout the course include the following:

- computer evolution and performance
- number systems and representations
- computer components and interconnections
- CISC and RISC processors
- pipelining and superscalar processors
- internal memory
- cache memory
- external memory
- input/output
- multicore computing

Visual Programming

Number of Credits: 4

lecturer: György Mészáros

requirements: exam

Purpose and requirements of the subject:

- The goal of the subject is the introduction of a widely used, Windows-based development environment, i.e. the Microsoft Visual Studio, and getting acquainted with some of its popular .NET programming languages like Visual Basic or C #.

Topics:

- After getting acquainted with the foundation of programming, the students will learn the basic steps of developing Windows-based programmes by applying object oriented planning and implementation techniques, setting up the graphical user interface, and setting up event driven control, which can be used in similar development environments.
- Requirements:
- Practical knowledge of the Microsoft Windows Operating System and the MS Office Software Suit.

2024/25 Spring Semester

Network Optimisation and Heuristic Programming

Number of Credits: 4
lecturer: Dr. Gábor Nagy
requirements: written exam

Purpose and requirements of the subject:
The purpose of the module is to provide students with an overview of problems and solution methods in Combinatorial Optimisation, with the majority of problems relating to networks. Although the focus is on exact solution methods, an introduction to heuristics, including meta-heuristics, will be provided. At the end of the module students should be able to:

- Formulate situations using appropriate network or similar models.
- Solve combinatorial optimisation problems using exact methods.
- Understand the need for heuristics and apply simple heuristic programming techniques.

Topics:

1. Introduction to graphs and networks
2. Shortest path problems
3. Maximum flow problems
4. Minimum spanning tree problems
5. Scheduling theory
6. Heuristic Programming (travelling salesman and knapsack problems)

Multimedia

Number of Credits: 5
lecturer. Dr. Veronika Kozma-Bognár
requirements: exam

Purpose and requirements of the subject:
The purposes of the subject are as follows:

- To inform students about the multimedia, information processing technology in general (audio, video, interactivity)
- To inform students about hardware and software components, their application possibilities.
- Theoretical lectures are followed by laboratory practices to develop the skills of the students in handling multimedia applications.

At the output of the course the student has to be able:

- to create multimedia project

Topics:
Lectures:

- Basics of multimedia, multimedia elements and systems.
- Discussing the importance of multimedia.
- Design of a multimedia project, general considerations.
- Multimedia applications.
- Using of multimedia elements, multimedia presentation.

Requirements:

- Should be able to solve all exercises discussed during lessons.
- Pass the practical exam.

2024/25 Spring Semester

Introduction to Corporate Finance

Number of Credits: 5
Lecturer: Dr. Eszter Solt
Requirement: written exam

This course provides a brief introduction to the fundamentals of corporate finance, emphasizing their application to a wide variety of real-world situations spanning corporate decision-making and financial intermediation. Key concepts and applications include: time value of money, risk-return tradeoff, cost of capital, interest rates, capital budgeting, asset valuation, discounted cash flow (DCF) analysis, net present value, internal rate of return, payback period.
Learning Objectives:

By the end of this course, students will be able to:

1. Price future certain (and uncertain) streams of cash flows;
2. Value projects and make capital budgeting decisions using various investment decision rules;
3. Value bonds and stocks;
4. Evaluate the financial and strategic implications of alternative corporate financing decisions in different environments.

Image Processing

Number of Credits: 5
lecturer: Dr. József Berke
requirements: exam

Purpose and requirements of the subject:
Our goal is to provide students with a comprehensive picture of the jobs at the end of their digital image processing topics of theory and practice, as well as major development and application trends in the near future. Students, with digital imaging multimedia instructor systems / DIGKEP v7.0 / using the theory and practical applications related tasks solved.

Topics:
Introduction
- Digital image processing concept, historical overview.

Human and machine vision
- Comparison of human and artificial vision systems. Image sensors in practice.

Image Processing Tools
- Input, storage, processing, copy, coding, compression and transmission.

Digital Imaging
- The digital imaging model, sampling, quantization, restoring a continuous image.

Image Enhancement
- Basic concepts, image restoration, Look-up-table transformations, noise reduction, edge enhancement, multi-band image correction.

Geometric Correction

- The geometric correction model, coordinate transformations, homogeneous coordinates, into practice.

Segmentation

- Segmentation aims, model, split, merge, edge detection.

Classification

- The classification model, statistical pattern recognition, clustering, pattern recognition, texture analysis.

Image Encoding and Compression

- Redundancy, expectations, lossless and lossy image compression, compression of moving images.

Applications

- agricultural applications,
- medical applications,
- remote sensing,
- digital photography,
- machine vision systems,
- digital video,
- computer animation,
- optical character recognition,
- visual data formats,
- criminal and security applications.

Business Communication

Number of Credits: 3

Lecturers: Dr. Kiss Natália
Requirement: presentation or essay

Purpose of the subject:
The aim of the subject is to make students familiar with the basic theories of communication and develop their communication, negotiation and presentation skills. By the end of the course students will be able to apply the acquired competencies and skills during everyday conversations, negotiations and business meetings. Students will learn how to structure and present a presentation for different purposes. Students will gain knowledge about the basic theories of culture and intercultural communication that can be useful for their future international career.

Topics:
The topics covered throughout the course include the following:

- Communication basics
- Negotiations, business meetings
- Presentation skills
- Intercultural communication