Tárgy neve: Complex information systems

Tárgyfelelős neve: Molnár Bálint

Tárgyfelelős tudományos fokozata: PhD, egyetemi docens

Tárgyfelelős MAB szerinti akkreditációs státusza: AT

Az oktatás célja angolul:

a) knowledge

- In order to be able to perform their work in an innovative way and do research (when necessary) in their own IT specialization, they have comprehensive and up-to-date knowledge of general mathematical and computing principles, rules and relationships, particularly – depending on their chosen specialization – in the following areas: algebraic, linear algebraic and number theory methods and applications, special fields of mathematical analysis, numerical methods and their applications; discrete mathematics, graph theory, logic and their applications; theoretical basics and applications of stochastic modelling and statistics; first-order and second-order statistical analysis, operation research; algorithmic methods in mathematics, formal models and tools in computing science, complexity and efficiency theory of algorithms, and special algorithms of application fields.
- They have comprehensive and up-to-date knowledge of specific IT tools, particularly – depending on their chosen specialization – in the areas of numerical computing systems, model analysis, scientific computing methods, digital signal and image processing, artificial intelligence methods, software methods of operation research and optimization, modern programming languages and paradigms, the usage of modern programming languages; theoretical foundations and applications of information systems; distributed and parallel systems, expert systems; information technology and application security, geoinformatics; the construction and organization of health information systems; new methods of information management and organization, corporate (enterprise & business) information systems, services of information systems implementing corporate (enterprise & business) processes; digital signal and image processing, computer graphics; web and multimedia applications, and media informatics.
- They are aware of the vital basics of organization and management, quality assurance and controlling, which enable them to carry out leadership and management duties related to their specialization.
- They are familiar with the principles of business, organizational and corporate procedure, information, data, software and technical-technological architectures as well as with the methods of describing and designing these architectures.
- They have a high level of fluency in the language of IT – including its professional vocabulary and its characteristic features of expression and composition – both in their mother tongue and in English, at least.

b) skills and abilities

- They are able to formalize complex IT tasks, to identify and study their theoretical and practical background and then to solve them.
- They are able to perform design, development, operation, and management tasks when operating complex software systems, database management systems, corporate information systems, decision support systems, and expert systems
- They are able to comprehensively understand, plan, organize, manage and control processes related to their IT specialization at management level.
- They are able to initiate collaboration and work in a team as well as on projects with IT or other professionals.
- They are able to analyze and apply new problem-solving methods and procedures related to their IT specialization.

- They are able to apply their IT skills in a diverse, multidisciplinary professional environment.
- They are familiar with IT professional vocabulary, which enables them to express themselves at a high level, both orally and in writing, in their mother tongue and (at least) in English; i.e. they are able to participate in discussions and debates, to write reports, to work with, understand and utilize scientific and technical literature (e.g. professional books, chapters, articles etc.).
- They are able to professionally use scientific and technical information sources to obtain knowledge necessary for solving a problem, and to critically interpret and evaluate it.
- Under professional guidance, they are able to carry out scientific research on their own, and to prepare for further studies at postgraduate level.

c) attitude

- They follow professional and technological developments in their IT field.
- They are committed to critical feedback and evaluation based on self-examination.
- They are committed to lifelong learning and they are open to acquiring new IT competencies.
- They accept and make their co-workers apply the ethical principles of work and organizational culture as well as those of IT scientific research.
- They share their knowledge and consider it important to disseminate professional IT results.
- They consider it important to propagate and realize environmentally conscious behavior and social responsibility, and they promote them with the help of information technology.
- They are committed to having quality requirements met and to analyzing them with IT tools.
- They are open to proactive collaboration with IT and other professionals.

d) autonomy and responsibility

- They take responsibility for their professional decisions made in their IT-related activities.
- They undertake to meet deadlines and to have deadlines met.
- They bear responsibility for their own work as well as for the work of their colleagues they work together with in a project.
- Regarding mission critical IT systems, they can be entrusted with developing and operational responsibilities that are in accordance with their professional competencies.

Az oktatás tartalma angolul:

The topics of lectures are as follows: Specific areas of Enterprise Resource Planning Systems are discussed. Moreover, the workflows related to the Process Chains of Enterprise Resource Planning Systems are overviewed, and the necessary basics of Business Process Management and Modeling Strongly coupled to workflows and business processes, the students will encounter the concepts of access rights management, information security, protection, privacy, internal and external auditing, controlling, management accounting

The students acquire knowledge of the data and process model of each significant area that are formulated as reference models in the literature.

The primary areas

1. Structured method for analyzing and design of Information Systems
2. Object Oriented Analysis and Design (UML visual language) for Information Systems
3. Requirements Engineering for Information Systems
4. Enterprise Resource Planning Systems as Complex Information Systems
   - 4.1. Business Processes, workflows, functional areas, organizational hierarchy
   - 4.2. Production and major processes
   - 4.3. Logistics as Business Process of Enterprises
   - 4.4. Production Logistics
   - 4.5. Demand Management, Forecasting, MRP (Material Requirement Planning)
   - 4.6. Warehousing, Inventory management
   - 4.7. Production Order
   - 4.8. Warehousing
   - 4.9. WFMS (Workflow Management Systems)
   - 4.10. SCM (Supply Chain Management)

4.11. Human Resources Management
4.12. Maintenance Management System
4.13. Integration problem. Different approaches. Current trends

A számonkérés és értékelés rendszere angolul:

continuous assessment, practical course mark and examination;
written (electronic) exam on the theoretical foundations of Complex Information Systems Essay questions, multiple choice, multiple answers

Idegen nyelven történő indítás esetén az adott idegen nyelvű irodalom:

Text book, compulsory:

- Duncan, J., Rackley, L., & Walker, A. (1995). SSADM in practice: a version 4 text. Macmillan.
- Langer, A. M. (2007). Analysis and design of information systems. Springer Science & Business Media.
- Larman, C. (2012). Applying UML and Patterns: An Introduction to Object Oriented Analysis and Design and Interactive Development. Pearson Education India.
- Magal, S. R., & Word, J. (2011). Integrated business processes with ERP systems. Wiley Publishing.

Proposed further reading:

- August-Wilhelm Scheer, (1994), Business Process Engineering Study Edition: Reference Models for Industrial Enterprises, Springer-Verlag ,1994