

**Tárgy neve:** Service Science

**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.

**Az oktatás tartalma angolul:**

Lecture 1. Foundations What are services? Why are they becoming increasingly important for society? What is a service system? How are they structured? How do they contrast with goods?

Lecture 2. Electronic Services Which developments enabled the evolution of services into electronic services? What different types of electronic services exist? Which technologies are available for their implementation?

Lecture 3. Service Innovation What is service innovation? Which available methods support projects for new services development?

Lecture 4. Service Design How is service design related to service innovation? Which known methods and techniques are available to design services?

Lecture 5. Service Semantics How to enrich the description of electronic services with semantic knowledge? What are the benefits for service providers?

Lecture 6. Service Analytics How can the wealth of data generated by services be used for analysis? Which main tasks and methods are available?

Lecture 7. Service Optimization Which mathematical models can be used to solve planning problems arising in the area of services? Which tools can be used to assist engineers?

Lecture 8. Service Co-creation What is value co-creation, service encounters, service quality, and service productivity? Which methods can be used to manage them?

Lecture 9. Service Markets How can service systems be commercialized?

Which methods enable the creation of competitive service markets? Which frameworks exist to model markets?

Lecture 10. Service Research What is the importance of recent research streams, such as service network analysis and service level engineering, for service systems? Why are service networks important for an interconnected world?

**A számonkérés és értékelés rendszere angolul:**

continuous assessment, practical course mark and examination;  
written (electronic) exam on the theoretical foundations of Services Science questions, multiple choice, multiple answers;  
assessment of the presentation and summary of the dedicated chapter, paper;

**Idegen nyelven történő indítás esetén az adott idegen nyelvű irodalom:**

Text book, compulsory:

- Cardoso, J. (2015). Fundamentals of Service Systems. H. Fromm, S. Nickel, G. Satzger, R. Studer, & C. Weinhardt (Eds.). Springer.
- Qiu, R. G. (2014). Service Science: The foundations of service engineering and management. John Wiley & Sons.
- Marc Lankhorst et al., Enterprise Architecture at Work, 2005, Springer-Verlag Berlin
- Eric Newcomer, Greg Lomow, Understanding SOA with Web Service, Addison Wesley Professional, 2004, ISBN: 0-321-18086-0
- Emilia Mendes • Nile Mosley (Eds.), Web Engineering, Springer-Verlag Berlin Heidelberg, 2006