Course description

Informing students on course requirements

(In accordance with information and study materials available on CooSpace)

From September 2019

Programme: general medicine, master's (unified 1st and 2nd cycle)

Course: Introduction to informatics (compulsory elective)

Academic year/Semester: 1st year, 1st semester

Educator and contact details (e-mail): Dr. József Tolnai PhD, assistant professor, (tolnai.jozsef@med.u-szeged.hu)

Type of course: lecture/seminar/practice/laboratory

Weekly hours of the course: 1 lecture + 2 practices / week

Credit vale of the course: 3

Type of examination: final exam at the end of semester, practice exam, other: interim evaluation

Preliminary requirements (preliminary academic performance or completed course required to fulfill the purposes and requirements of the course): none

Purpose of course:

The **aim of the course** is to educate students in the use of modern information technologies for effective work in life sciences. The students will acquire practical knowledge and basic skills required in biomedical data processing, document management, presentation and in various areas of computer communication.

The **lectures** cover the basic concepts of medical informatics, the fundamentals of computer architecture, principles and functions of software applications, operating systems, computer networks and web-based applications. The lecture topics also include the concepts of data processing and presentation in life sciences, medical digital imaging and innovative medical solutions such as telemedicine, medical application of 3D printing and virtual or augmented reality.

The aim of the **practical course** is to provide basic practical skills in electronic communication, computer-aided analyses of biomedical data, creating electronic documents and presentations in medical sciences, telemedicine and 3D printing.

Outcome requirements of the course (specific academic results to be established by the course):

Knowledge	Ability	Attitude	Autonomy-responsibility
Knows the basic concepts of IT: the basic components of computer	Able to determine the hardware and software parameters (capacity, type,	Open to IT news, software / hardware.	Uses IT hardware tools and new software with guidance.

architecture, the concepts, computer types and structure, development history of hardware, software and operating systems.	version, etc.) of the IT devices he/she uses and set the basic parameters.		
Knows the principles of computer networks, transmission media, communication speed, grouping of networks (by size, topology, role of computers), the concept of network protocol, Internet addressing (IP address, domain name, structure, etc.).	Uses computer networks consciously.	Recognizes the benefits of infocommunication networks.	Chooses the most effective telecommunication methods independently, with responsibility.
Familiar with Internet services and is aware of the privacy policies.	Uses web browsers and web-based services with appropriate privacy policies.	Uses web-based services in a competent manner.	Chooses the most effective Internet services independently, with responsibility.
Knows malicious software, knows the concept of computer virus, its types, infection pathways and ways of protection.	Able to perform a backup, assess computer virus protection. Recognizes a computer virus infection.	Knows the importance of taking appropriate security measures against computer viruses.	Uses IT tools responsibly, is aware of the potential dangers.
Knows the essence of cloud-based computing, the types and benefits of cloud-based services, and the gist of cloud-based computing.	Able to use cloud-based services.	Recognizes the importance of cloud-based data storage and applications, and the benefits of using them.	Open to use cloud-based services on his/her own.
Knows the types of health data (visual and textual), the ways in which they are stored, displayed and processed. Has knowledge about integrated hospital information systems, medical imaging networks, and ethical, security,	Able to make statistical analyses and graphs of basic health data in a spreadsheet application and use them for analysis, essays and lectures.	Knows how to process health data with a computer and also the security rules of data management.	Manages patient data with competence and responsibility.

and legal issues related to the data.			
Knows the basic concepts, methods, tools and current implementations of telemedicine.	Able to use basic telemedicine tools, to measure physiological signals, to send and to interpret measured data.	Open to telemedicine applications for use and development of tools.	Recognizes the need to integrate telemedicine into the health care system and seeks to do so individually or in groups to reduce waiting lists and specialist workloads.
Knows the concepts of free software, open source and Linux distribution, and the four basic rights associated with free software.		Endeavours to use free software wherever possible, avoiding illegal software use.	Recognizes and disseminates the importance of free software and the benefits of using it.
Knows effective and modern presentation techniques and principles of presentation.	Able to make appropriate presentations, with transitions, animations, timings and slide masters in a presentation software.	Open for the use familiar presentation techniques and strives to produce consistent-looking, easy-to-follow presentations.	Creates and presents his/her electronic presentations independently.
Knows the basic typographic concepts for document editing (line, paragraph, page, indent, space, page break, section break, footer, header), and general document editing principles.	Creates, modifies, and applies styles in a given word processor, inserts graphics, generates table of contents, an index, creates a bibliography, manages cross-references, and footnotes.	Strives to apply the typographic principles to the production of sophisticated and easy to follow electronic and paper based documents.	Solves word processing and document management tasks independently.
Knows the basic principles of 3D printing with FDM and SLA technology, their medical applications and the basics of bioprinting technology.	Able to recognize types of 3D printers. Understands their basic working principles.	Open to medical applications for 3D printers.	
Knows the technology bases of virtual (VR) and augmented reality (AR) as well as their uses in modern medicine.	Recognizes VR and AR devices, understands how they work, and how to use them	Open to innovative medical applications of virtual and augmented reality.	Manages simpler VR and AR devices and applications independently.

Topics:

Topics of the lectures

- Information technology in medical education
- Computer architecture, from personal computers to supercomputers and smart devices
- Computer software, Operating Systems, viruses
- Medical image processing
- Computer networks
- Internet, cloud computing and data security
- Data presentation
- Telemedicine
- Medical applications of 3D design and printing
- 3D bioprinting
- Medical applications of virtual and augmented reality
- Free software

Topics of practices

- Evaluation of medical data with spreadsheets (input, validation, references, calculations, functions, basic statistics, charts, sorting, filtering, large tables, regression, pivot table, etc.)
- Creating scientific presentation (PowerPoint, Prezi, Mentimeter)
- Medical data on the web, creating online medical surveys and forms
- Documents, formatting large documents (styles, table of contents, figures and captions, list of figures, etc.), advanced document editing (header, footer, footnote, endnote, cross reference, references, etc.)
- Telemedicine and 3D printing in practice

Supporting methods to achieve learning outcomes:

In the lectures we use a frontal form of work (explanation, presentation). In the practices, exercises are done as frontal work (projected task solution, explanation, questioning, discussion) followed by individual or group work.
We help students with their own personalized learning through the use of practice materials uploaded to CooSpace and self-developed e-learning materials.

Evaluation of the acquisition of expected learning outcomes:

Attendance of the lectures is strongly recommended, downloading lecture slides cannot substitute for the participation at the lecture. There is no end-semester final exam. The course ends in a five-step evaluation.

Attendance at the practices is obligatory. Completion of the practical course is certified by the instructor's signature. The **prerequisites for this signature** are attending them and writing the pass level of mid-term tests. Practices can be made

up by students on their own with tutorials and e-learning materials uploaded to Coospace. The absence shall be certified in accordance with faculty and university regulations.

During the semester student have to pass **two practical tests** (**each with maximum of 100 points**), including a theoretical (25%) and a practical part (75%). **A maximum of 10 bonus points** can be awarded by the practical teacher for individual work. **Further 2 points/lecture** can be awarded for a successful Mentimeter test at the end of each lecture.

Retake is possible at the end of the semester on the last practice.

Grades of the course are determined as follows:

- 0–100 points: failed (1)
- 101–125 points: passed (2)
- 126–150 points: accepted (3)
- 151–175 points: good (4)
- 176–200 points: excellent (5)

Mandatory reading list

- Uploaded teaching materials
- Annotated lecture presentations

Recommended reading list:

- The webpage of Microsoft Office: http://office.microsoft.com
- Office help and support webpage: https://support.office.com

Indicating course requirements on CooSpace scene (summary)

Description (public):

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