Subject card

Subject name and code	Markup Languages in Medical Applications, PG_00047855
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering

Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
Education level	first-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	6	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment

Conducting unit	Department of Biomedical Engineering -> Faculty of Electronics, Telecommunications and Informatics

Name and surname of lecturer (lecturers)	Subject supervisor	dr Tomasz Neumann
	Teachers	dr Tomasz Neumann

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						

Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
	Number of study hours	30	3.0	42.0	75

Subject objectives	The aim of the course is to introduce students with knowledge and skills related to the basics of markup languages, related to healthcare applications.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W04] knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices	The student gained knowledge to use tools and programming languages to create and modify structured data using various tag formats.	[SW1] Assessment of factual knowledge
	[K6_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study	Student skills gained - Create a schema DTD - The creation of XML Schema, - Use of existing (standard) XML Schema schemas in the construction of its own schema, - Validate an XML document - Transformation of an XML document into another XML schema, - Transform XML into HTML, PDF, - Processing of XML data using XPath and XQuery - The use of XML in database management systems, - data processing in JSON format, - data processing in YAML format. - reading and writing medical files in the DICOM standard - reading and writing medical data in non-standard formats, - support for the GIT version system.	[SU1] Assessment of task fulfilment
	[K6_U07] can apply methods of process and function support, specific to the field of study	The student earned skills: - Design of digital document templates for medical applications	[SU1] Assessment of task fulfilment

Subject contents	1. Representation of information in informatics - basic definitions and classifications 2. SGML and XML an introduction 3. Logical syntax of an XML document - the language specification 4. Well-formed XML document - rules for creation and verification of data objects 5. XML document parsing - DOM 6. XML document parsing - SAX 7. Validity constraints for XML documents - validation 8. Designing of schema for an XML document - DTD 9. Designing of schema for an XML document - XML Schema 10. Description and retrieval of data and XML documents - XPath 11. Description and retrieval of data and XML documents - XQuery 12. Transformation of XML documents - an introduction 13. Transformation of XML documents - XSL 14. Transformation of XML documents - XSLT 15. Transformation of XML documents - XSL FO 16. Security of XML documents: XML Signature, XML Encryption 17. XML in Web Services: XML-RPC, SOAP, WSDL 18. Structure and operations on JSON files 19. Structure and operations on files in the YAML format 20. Structure of DICOM files 21. Medical files saved in various encoding formats, 22. Operating a version control system during data processing and modification
Prerequisites and co-requisites	No requirements

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Practical exercise	51.0%	60.0%
	Written tests	51.0%	40.0%

Recommended reading	Basic literature	Materiały do przedmiotu opracowane w formie edukacji na odległość, dostęp: http://uno.biomed.gda.pl Priscilla Walmsley, Wszystko o XML Schema, WNT, 2007 Priscilla Walmsley, XQuery, OReilly, 2007 Skrypt z materiałami do przedmiotu Metody reprezentacji informacji Steven Holzner, XML. Vademecum profesjonalisty, WNT, 2001 W3C, Rekomendacje XML, XML Schema, XPath, XQuery i HTML, www.w3.org
	Supplementary literature	No requirements
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable

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