Faculty of Computer Science and Information Technology

WEST POMERANIAN UNIVERSITY OF TECHNOLOGY
IN SZCZECIN, POLAND

THE OFFER FOR INTERNATIONAL STUDENTS
FOR THE YEAR 2021/2022
THIRD DEGREE

	Course title	Person responsible for the course	Semester (winter/summer)	ECTS points	Hours
1	Brain-Computer Interface	Izabela Rejer	winter/summer	4	60
2	EEG signal analysis in Matlab	Izabela Rejer	winter/summer	4	60
3	LaTeX	Remigiusz Olejnik	winter/summer	2	30

Course title	Brain-Computer Interface		
Level of course	third cycle		
Teaching method	laboratory course / lecture		
Person responsible for the course	Izabela Rejer	**E-mail address to the person**	irejer@wi.zut.edu.pl
Course code (if applicable)	WI-3-BCI	**ECTS points**	4
Semester	winter/summer	**Language of instruction**	english
Hours per week	4	**Hours per semester**	60
Objectives of the course	To provide the knowledge about EEG devices, the features of EEG data, and the methods for transforming EEG data to signals used for controling brain computer interfaces. To equip the students with the ability of designing and programming interfaces controlling the external devices with brain waves.		
Entry requirements	None		
Course contents	The applications for EEG data analysis. Tests of different EEG devices. Creating a BCI for a given control task. Testing the interface with real users. Exam. Brain Computer Interface (BCI) - the main paradigms. The main parts of a human brain. The main structure of BCI Controling external devices with BCI. Methods for EEG data preprocessing, feture extraction and classification used in BCI. Exam.		
Assessment methods	Informative lectures. Discussion. Laboratories with computers and EEG devices. The final report describing the created interface, tests results, and the conclusions. The final discussion summing up the knowlegde gained during the lectures.		
Recommended readings	1. Lotte F., Study of Electroencephalographic Signal Processing and Classification Techniques towards the use of Brain-Computer Interfaces in Virtual Reality Applications, 2008, PhD Thesis, https://sites.google.com/site/fabienlotte/phdthesis		
Knowledge	After the lectures the student will be able to: define a BCI, describe the main problems with EEG data, describe the EEG device, descibe different BCI paradigms, choose the processing methods suitable for different paradigms and different EEG data.		
Skills	The student will be able to create the project of a BCI suitable for a given task.		

Course title	EEG signal analysis in Matlab		
Level of course	third cycle		
Teaching method	laboratory course / lecture		
Person responsible for the course	Izabela Rejer	**E-mail address to the person**	irejer@wi.zut.edu.pl
Course code (if applicable)	WI-3-EEG	**ECTS points**	4
Semester	winter/summer	**Language of instruction**	english
Hours per week	4	**Hours per semester**	60
Objectives of the course	To teach students how to record, process and analyze EEG signals in Matlab environments.		
Entry requirements	None		
Course contents	Introduction to Matlab programming OpenVibe platform Sending data from OpenVibe to Matlab Recording EEG signals with 19-channel Discovery 20 device Removing artifacts from EEG signal Spatial and temporal filtering Extracting different brain activity patterns from EEG recording Exam. EEG signals - main characteristics Main types of artifacts and methods for removing them Spectral analysis of EEG signal (Fourier transform) Extracting different brain activity patterns from EEG recording Exam.		
Assessment methods	Informative lectures. Discussion. Laboratories with computers and EEG devices. The final report describing the detailed results of the analysis of the EEG signal acquired durings laboratories and processed in Matlab environment. The final discussion summing up the knowlegde gained during the lectures.		
Recommended readings	1. Lotte F., Study of Electroencephalographic Signal Processing and Classification Techniques towards the use of Brain-Computer Interfaces in Virtual Reality Applications, 2008, PhD Thesis, https://sites.google.com/site/fabienlotte/phdthesis 2. S. W. Smith, Digital Signal Processing: A practical Guide for Engineers and Scientists, 2003 3. Official Matlab site: http://www.mathworks.com/help/matlab/		
Knowledge	After the lectures the student will be able to: define a BCI, describe the main problems with EEG data, describe the EEG device, descibe different BCI paradigms, choose the processing methods suitable for different paradigms and different EEG data.		
Skills	The student will be able to create the project of a BCI suitable for a given task.		

Course title	LaTeX		
Level of course	third cycle		
Teaching method	laboratory course / lecture		
Person responsible for the course	Remigiusz Olejnik	**E-mail address to the person**	Remigiusz.Olejnik@zut.edu.pl
Course code (if applicable)	WI-3-LAT	**ECTS points**	2
Semester	winter/summer	**Language of instruction**	english
Hours per week	2	**Hours per semester**	30
Objectives of the course	Practical skills in typesetting of engineering documents using LaTeX system.		
Entry requirements	Ability to use a computer running Linux or MS Windows operating system.		
Course contents	Preparing of documents of increasing complexity; changing of the font type and size, defining of the text layout, tables, complex mathematical formulas and mathematical texts; creating and inserting pictures; analysis of style files and preparation own styles for journals, books, reports and thesis; merging results of all exercises in a single document with the form of a book, with table of contents, bibliography, appendices and index. Description of the installation and initialization of the package, setting of environment variables, hyphenation file. LaTeX input file and the principles of its building, permanent elements of the file. Structure of the document: the division of the document into parts, chapters, sections, paragraphs, etc., title page, the main file and included files, creating of a table of contents, table of figures and tables, attaching a bibliography, creating an index, references to the labels, usage of the counters. Defining own classes of documents: building of the style definition file and possibilities of changing its content. Defining of running heads for page headings and footers, defining of parameters for lists, floating objects, defining of headers for chapter and subsections, changing of the format of the table of contents and bibliography. Predefined classes of document and format, format definition file declared in the preamble (page size, the type of numbering, margins, running head, footer). Defining the type and size of fonts, special characters, accents, Polish diacritic characters. Length measures, horizontal and vertical spacing, references, breaking lines and pages. Defining of indivisible elements. Multiple columns usage. Greek and Cyrillic alphabet. Mathematical texts: mathematical environment, using mathematical expressions and symbols (indices, fractions, roots, equations and their systems, matrices, complex formulas), spacing and bold in math mode. Special text structures: defining minipages, lists and tables, creating pictures and including them into document, language of geometric figures definition. Changes to the definitions, creating of own definitions and defining a new environment. Creating new variable objects. Correction of the errors: error messages and warnings in LaTeX and TeX, error correction capabilities.		
Assessment methods	Lecture with presentation Laboratory work - individual preparation of the document with increasing complexity Lecture - oral exam Laboratory work - evaluation of submitted document that has been prepared during the course		
Recommended readings	1. L. Lamport, LaTeX: A Document Preparation System, Addison-Wesley, Boston, 1994 2. F. Mittelbach et al., The LaTeX Companion (Tools and Techniques for Computer Typesetting), Addison-Wesley, Boston, 2004		
Knowledge	Student has knowledge about typesetting engineering documents with LaTeX system		
Skills	Student has practical skills in typesetting of engineering documents with LaTeX system		