Biocomputational Language

Module designation	Providing an understanding of biocomputational language concepts. Able to describe topics, tools, and applications of computational linguistics in the field of biomedical engineering.
Module level, if applicable	Master
Code	SPSTB212232
Subtitles, if applicable	-
Courses, if applicable	-
Semester(s) in which the module is taught	Odd/Even semester
Person responsible for the module	Yunita Sari, S.Kom, M.Sc, Ph.D
Lecturers	Yunita Sari, S.Kom, M.Sc, Ph.D Prof. Dra. Sri Hartati, M.Sc., Ph.D
Language	Indonesian & English
Relation to curriculum	Elective course
Type of teaching, contact hours	This course is planned to have 14 teaching weeks and 2 weeks of examination. several types of teaching conducted: - Classic tutorial, - Case-study learning, - Discussion - Practical Activity

Workload	This course is planned to have 13 teaching weeks, 1 week lab visit, and 2 weeks of examination. Lectures = 3 SKS x 50 minutes x 15 meetings $\qquad$ = 2250 minutes $\qquad$ = 37.5 hours $\qquad$ = 37.5 hours/25 hours $\qquad$ =1.5 ECTS Experiment/Practical Activities= 3 SKS x 60 minutes x 1 meeting $\qquad$ = 180 minutes $\qquad$ = 3 hours $\qquad$ = 3/25 hours $\qquad$ = 0.12 ECTS Assigment = 3 SKS x 60 minutes x 16 meetings $\qquad$ = 2880 minutes $\qquad$ = 48 hours $\qquad$ = 48 hours/ 25 hours $\qquad$ =1.92 ECTS Self Study = 3 SKS x 60 minutes x 16 meetings $\qquad$ = 2880 minutes $\qquad$ = 48 hours $\qquad$ = 48 hours/ 25 hours $\qquad$ =1.92 ECTS Total workload = 5.46 ECTS
Credit points	3 SKS (5.46 ECTS)
Requirements according to the examination regulations	-
Recommended prerequisites	-
Module objectives/intended learning outcomes	PLO 2: Able to design research related to artificial organs and medical instrumentation. PLO 3: Able to test and analyze relevant design results in biomedical engineering field. PLO 4: Able to communicate and work effectively in a multi-disciplinary team.

Content	1. Introduction to NLP, Bio-Medical NLP and research in this area. 2. Text processing, Regular Expression, Python programming (basic) 3. Text classification using perceptron (basic) 4. Language modelling (basic and advanced) 5. Named Entity Recognition (basic and related to biomedical text) 6. Independent Assignment I : bio-computational language project for biomedical engineering application (idea pitching) 7. Part of Speech tagging using HMM Statistical modeling and machine learning 8. Natural Language Inference (identifying inference relation: entailment, neutral or contradiction -between sentences) 9. Computer-aided Diagnostic 10. Independent Assignment II : Project Presentations 11. Practical Activities → Computer Aided Diagnostic
Study and examination requirements and forms of examination	Classes are conducted with 80% classic tutorial and 20% case study/project based presentation. Exams are done by written exam and/or task-based exam.
Media employed	PowerPoint, LMS (eLok, Google Classroom, etc.), and online meeting platform (Zoom, Gmeet, etc.)
Reading list	1. Jurafsky, D. and J. H. Martin, Speech and language processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition (2nd Edition). Prentice-Hall, 2008 2. Dickinson, Brew, and Meuers 2013, Language and Computers
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