

MODULE HANDBOOK ASSISTIVE AND WELFARE TECHNOLOGIES



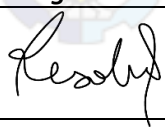
**BACHELOR DEGREE PROGRAM
DEPARTMENT OF BIOMEDICAL ENGINEERING
FACULTY OF INTELLIGENT ELECTRICAL AND INFORMATICS
TECHNOLOGY**

INSTITUT TEKNOLOGI SEPULUH NOPEMBER

ENDORSEMENT PAGE



MODULE HANDBOOK Assistive and Welfare Technologies DEPARTMENT OF BIOMEDICAL ENGINEERING INSTITUT TEKNOLOGI SEPULUH NOPEMBER Number : B/21383/IT2.IX.5.1.2/PP.03.00.00/2020

Proses Process	Penanggung Jawab Person in Charge			Tanggal Date
	Nama Name	Jabatan Position	Tandatangan Signature	
Perumus Preparation	Dr. Achmad Arifin, S.T., M.Eng.	Dosen Lecturer		November 23, 2019
Pemeriksa dan Pengendalian Review and Control	Prof. Dr. Ir. Mohammad Nuh, DEA.	Tim kurikulum Curriculum team	TTD	February 14, 2020
Persetujuan Approval	Ir. Josaphat Pramudijanto, M.Eng.	Koordinator RMK Course Cluster Coordinator		March 06, 2020
Penetapan Determination	Dr. Achmad Arifin, S.T., M.Eng.	Kepala Departemen Head of Department		March 13, 2020

MODULE HANDBOOK

ASSISTIVE AND WELFARE TECHNOLOGIES

Module name	Assistive and Welfare Technologies	
Module level	Undergraduate	
Code	EB184904	
Course (if applicable)	Assistive and Welfare Technologies	
Semester	Specialization	
Person responsible for the module	Dr. Achmad Arifin, S.T., M.Eng.	
Lecturer		
Language	Bahasa Indonesia and English	
Relation to curriculum	Undergraduate degree program, specialization .	
Type of teaching, contact hours	Lectures, <60 students Tuesdays, 11.00-12.50 (GMT+7)	
Workload	1. Lectures : 3 x 50 = 150 minutes per week. 2. Exercises and Assignments : 3x 50 = 150 minutes per week. 3. Private learning : 3 x 50 = 150 minutes per week.	
Credit points	3 credit points (sks)	
Requirements according to the examination regulations	A student must have attended at least 75% of the lectures to sit in the exams.	
Mandatory prerequisites	-	
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) after completing this module, CLO 1: Students understand and are able to explain disabilities, the history and development of assistive and welfare technologies. CLO 2: Students understand and able to explain about assistive technology for deaf disabilities CLO 3: Students understand and are able to explain about assistive technology for mute disabilities CLO 4: Students understand and are able to explain about assistive technology for blind disabilities CLO 5: Students understand and are able to explain about assistive technology for the disabled.	PLO-02 PLO-05 PLO-05 PLO-03 PLO-03

	CLO 6: Students understand and are able to explain about assistive technology for mentally disabled people CLO 7: Students understand and are able to explain about Welfar technology for public facilities and social services, the latest issues and developments	PLO-05 PLO-06
Content	The Assistive Technology and Welfar courses aim to provide an understanding of assistive technology design for persons with disabilities (deaf, mute, blind, disabled and mentally disabled) and Welfar technology for public facilities and social services, issues and the latest developments in assistive technology and welfar. Students are expected to be able to implement this knowledge in developing assistive devices to improve or maintain the lives of people with permanent or temporary disabilities.	
Study and examination requirements and forms of examination	● In-class exercises ● Assignment 1, 2, 3, 4, 5, 6, 7 ● Mid-term examination ● Final examination	
Media employed	LCD, whiteboard, websites (myITS Classroom), zoom.	
Reading list	Main : 1. Marion Hersh, Michael A Johnson, "Assistive Technology for the Hearing-impaired, Deaf and Deafblind", Springer-Verlag London, 2003 2. Marion Hersh, Michael A Johnson, "Assistive Technology for Visually Impaired and Blind People", Springer-Verlag London, 2008 Supporting : 1. Giulio Lancioni, Nirbhay N. Singh, "Assistive Technologies for People with Diverse Abilities", Springer-Verlag New York, 2014 2. Tohru Ifukube, "Sound-Based Assistive Technology", Springer International Publishing, 2017	

I. Rencana Pembelajaran Semester / Semester Learning Plan

	INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS) FACULTY OF INTELLIGENT ELECTRICAL AND INFORMATICS TECHNOLOGY DEPARTMENT OF BIOMEDICAL ENGINEERING					Document Code
SEMESTER LEARNING PLAN						
MATA KULIAH (MK) <i>COURSE</i>	KODE <i>CODE</i>	Rumpun MK <i>Course Cluster</i>	BOBOT (sks) <i>Credits</i>		SEMESTER	Tgl Penyusunan <i>Compilation Date</i>
Teknologi Asistif dan Welfar <i>Assistive and Welfare Technologies</i>	EB184904	Biocybernetics	T=3	P=0	Specializat ion	Feb 27, 2020
OTORISASI / PENGESAHAN <i>AUTHORIZATION / ENDORSEMENT</i>	Dosen Pengembang RPS <i>Developer Lecturer of Semester Learning Plan</i>		Koordinator RMK <i>Course Cluster Coordinator</i>		Ka DEPARTEMEN <i>Head of Department</i>	
	(Dr. Achmad Arifin, S.T., M.Eng.)		(Ir. Josaphat Pramudijanto, M.Eng.)		(Dr. Achmad Arifin, S.T., M.Eng.)	
Capaian Pembelajaran	CPL-PRODI yang dibebankan pada MK <i>PLO Program Charged to The Course</i>					
Learning Outcomes	CPL-02 PLO-02	Mampu menemukan, memahami, menjelaskan, merumuskan, dan menyelesaikan permasalahan umum pada bidang asistif teknologi dan welfar <i>Able to find, understand, explain, formulate, and resolve common problems in the field of assistive technology and welfar</i>				
	CPL-03 PLO-03	Mampu merancang dan melaksanakan eksperimen laboratorium dan/atau lapangan, menganalisa dan menginterpretasi data, serta menggunakan penilaian yang obyektif untuk menarik kesimpulan <i>Able to design and implement laboratory experiment and / or field experiments, analyze and interpret data, and use objective assessments to draw conclusions</i>				
	CPL-05 PLO-05	Mampu mendesain komponen, sistem, dan proses dalam bidang Teknik Biomedika yang sistematis, logis, dan realistis sesuai dengan spesifikasi yang ditentukan dengan mempertimbangkan aspek keselamatan, sosial, budaya, lingkungan, dan ekonomi dengan mengenali/memanfaatkan sumber daya lokal dan nasional dengan wawasan global				

		<i>Able to design components, systems, and processes in the field of Biomedical Engineering that are systematic, logical, and realistic appropriate with specified specifications by considering aspects of safety, social, cultural, environmental, and economic by recognizing / utilizing local and national resources with global insight</i>
CPL-06 PLO-06		Mampu menerapkan ilmu pengetahuan, keterampilan, dan metode terkini dalam menyelesaikan permasalahan di bidang Teknik Biomedika <i>Able to apply the latest knowledge, skills and methods in solving problems in the field of Biomedical Engineering</i>
Capaian Pembelajaran Mata Kuliah (CPMK) Course Learning Outcome (CLO) - If CLO as description capability of each Learning Stage in the course, then CLO = LLO		
CP MK 1 CLO 1		Mahasiswa memahami dan mampu menjelaskan tentang disabilitas, sejarah dan perkembangan teknologi assistif dan welfar <i>Students understand and are able to explain disabilities, the history and development of assistive and welfare technologies</i>
CP MK 2 CLO 2		Mahasiswa memahami dan mampu menjelaskan tentang teknologi assistif untuk disabilitas tuna rungu <i>Students understand and able to explain about assistive technology for deaf disabilities</i>
CP MK 3 CLO 3		Mahasiswa memahami dan mampu menjelaskan tentang teknologi assistif untuk disabilitas tuna wicara. <i>Students understand and are able to explain about assistive technology for mute disabilities</i>
CP MK 4 CLO 4		Mahasiswa memahami dan mampu menjelaskan tentang teknologi assistif untuk disabilitas tuna netra <i>Students understand and are able to explain about assistive technology for blind disabilities</i>
CP MK 5 CLO 5		Mahasiswa memahami dan mampu menjelaskan tentang teknologi assistif untuk disabilitas tuna daksa. <i>Students understand and are able to explain about assistive technology for the disabled.</i>
CP MK 6 CLO 6		Mahasiswa memahami dan mampu menjelaskan tentang teknologi assistif untuk disabilitas tuna grahita <i>Students understand and are able to explain about assistive technology for mentally disabled people</i>
CP MK 7 CLO 7		Mahasiswa memahami dan mampu menjelaskan tentang teknologi welfar untuk fasilitas publik dan pelayanan social, isu dan perkembangan terkini <i>Students understand and are able to explain about Welfar technology for public facilities and social services, the latest issues and developments</i>

Peta CPL – CP MK <i>Map of PLO - CLO</i>	<table><tr><th></th><th>CPL-01</th><th>CPL-02</th><th>CPL-03</th><th>CPL-04</th><th>CPL-05</th><th>CPL-06</th><th>CPL-07</th><th>CPL-08</th><th>CPL-09</th><th>CPL-10</th><th>CPL-11</th><th>CPL-12</th></tr><tr><td>CPMK 1 / SUB CPMK 1 <i>CLO 1 / LLO 1</i></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CPMK 2 / SUB CPMK 2 <i>CLO 2 / LLO 2</i></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CPMK 3 / SUB CPMK 3 <i>CLO 3 / LLO 3</i></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CPMK 4 / SUB CPMK 4 <i>CLO 4 / LLO 4</i></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CPMK 5 / SUB CPMK 5 <i>CLO 5 / LLO 5</i></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CPMK 6 / SUB CPMK 6 <i>CLO 6 / LLO 6</i></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CPMK 7 / SUB CPMK 7 <i>CLO 7 / LLO 7</i></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>		CPL-01	CPL-02	CPL-03	CPL-04	CPL-05	CPL-06	CPL-07	CPL-08	CPL-09	CPL-10	CPL-11	CPL-12	CPMK 1 / SUB CPMK 1 <i>CLO 1 / LLO 1</i>													CPMK 2 / SUB CPMK 2 <i>CLO 2 / LLO 2</i>													CPMK 3 / SUB CPMK 3 <i>CLO 3 / LLO 3</i>													CPMK 4 / SUB CPMK 4 <i>CLO 4 / LLO 4</i>													CPMK 5 / SUB CPMK 5 <i>CLO 5 / LLO 5</i>													CPMK 6 / SUB CPMK 6 <i>CLO 6 / LLO 6</i>													CPMK 7 / SUB CPMK 7 <i>CLO 7 / LLO 7</i>												
	CPL-01	CPL-02	CPL-03	CPL-04	CPL-05	CPL-06	CPL-07	CPL-08	CPL-09	CPL-10	CPL-11	CPL-12																																																																																													
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Diskripsi Singkat MK <i>Short Description of Course</i>	Mata kuliah Teknologi Assistif dan Welfar ini bertujuan untuk memberikan pemahaman tentang disain peralatan asistif untuk penyandang disabilitas (tuna rungu, tuna wicara, tuna netra, tuna daksa dan tuna grahita) dan teknologi welfar untuk fasilitas publik dan pelayanan social, isu dan perkembangan terkini dari teknologi assistif dan welfar. Mahasiswa diharapkan mampu mengimplementasikan pengetahuan tersebut dalam pengembangan peralatan asistif untuk memperbaiki atau mempertahankan hidup orang yang mengalami difabilitas permanen maupun sementara. <i>The Assistive Technology and Welfar courses aim to provide an understanding of assistive technology design for persons with disabilities (deaf, mute, blind, disabled and mentally disabled) and Welfar technology for public facilities and social services, issues and the latest developments in assistive</i>																																																																																																								

	<i>technology and welfar. Students are expected to be able to implement this knowledge in developing assistive devices to improve or maintain the lives of people with permanent or temporary disabilities.</i>						
Bahan Kajian: Materi pembelajaran Course Materials:	1. Pengantar disabilitas dan device dalam teknologi assistif / <i>Introduction to disabilities and devices in assistive technology</i> 2. Teknologi assistif untuk disabilitas : tuna rungu, tuna wicara, tuna netra, tuna daksa dan tuna grahita / <i>Assistive technology for disabilities: deaf, mute, blind, disabled and mentally disabled</i> 3. Teknologi welfar untuk fasilitas publik dan pelayanan sosial / <i>Welfar technology for public facilities and social services</i>						
Pustaka References	Utama / Main:						
	1. Marion Hersh, Michael A Johnson, “Assistive Technology for the Hearing-impaired, Deaf and Deafblind”, Springer-Verlag London, 2003 2. Marion Hersh, Michael A Johnson, “Assistive Technology for Visually Impaired and Blind People”, Springer-Verlag London, 2008						
	Pendukung / Supporting:						
	1. Giulio Lancioni, Nirbhay N. Singh, “Assistive Technologies for People with Diverse Abilities”, Springer-Verlag New York, 2014 2. Tohru Ifukube, “Sound-Based Assistive Technology”, Springer International Publishing, 2017						
Dosen Pengampu Lecturers							
Matakuliah syarat Prerequisite	-						
Mg ke/ Week	Kemampuan akhir tiap tahapan belajar (Sub-CPMK) / <i>Final ability of each learning stage (LLO)</i>	Penilaian / Assessment		Bantuk Pembelajaran; Metode Pembelajaran; Penugasan Mahasiswa; [Estimasi Waktu] / <i>Form of Learning; Learning Method; Student Assignment;</i> [Estimated Time]		Materi Pembelajaran [Pustaka] / <i>Learning Material</i> [Reference]	Bobot Penilaian /Assessment Load (%)
		Indikator / Indicator	Kriteria & Teknik / Criteria & Techniques				
(1)	(2)	(3)	(4)	Tatap Muka /	Daring /	(7)	(8)

				<i>In-class (5)</i>	<i>Online (6)</i>		
1	Mahasiswa memahami dan mampu menjelaskan tentang disabilitas, sejarah dan perkembangan teknologi assistif dan welfar <i>Students understand and are able to explain disabilities, the history and development of assistive and welfare technologies..</i>	● Kebenaran pemahaman, jawaban dan analisa ● Keberhasilan menjelaskan tugas ● Ketepatan waktu pengumpulan tugas ● <i>Correct in understanding, answers and analysis</i> ● <i>Able to explain the assignments</i> ● <i>On time submission of assignments.</i>	Non-tes : Tugas 1 - Tugas tertulis mengenai disabilitas, sejarah dan perkembangan teknologi assistif dan welfar. Task 1 - <i>Written assignments regarding disabilities, history and development of assistive and welfar</i>	● Kuliah dan brainstorming, tanya jawab. [TM : 3 x 50"] [BM : 3 x 50"] [PT : 3x 50"] ● <i>Presentation and brainstorming, ask and answer.</i> [FF : 3 x 50"] [SA : 3 x 50"] [SS : 3 x 50"]	● Chatting dan diskusi dalam forum platform ITS. ● <i>Chat and discussion in ITS platform forum.</i>	● Kontrak kuliah: - Motivasi belajar - Rencana pembelajaran - Aturan-aturan perkuliahan - Tujuan perkuliahan - Sistem penilaian, buku ajar/sumber pustaka ● Pengenalan pada disabilitas, jenis-jenis disabilitas, sejarah dan perkembangan teknologi assistif dan welfar ● [Link materi di MyITSClassroom] ● <i>Course contract:</i> - <i>Motivation to learn</i> - <i>Lesson plan</i> - <i>Lecture rules</i> - <i>Course objective</i> - <i>Assessment system, textbooks / library resources</i>	5

						• <i>Introduction to disabilities, types of disabilities, history and development of assistive and welfar</i>	
2-3	Mahasiswa memahami dan mampu menjelaskan tentang teknologi assistif untuk disabilitas tuna rungu <i>Students understand and able to explain about assistive technology for deaf disabilities</i>	• Kebenaran pemahaman, jawaban dan analisa • Keberhasilan menjelaskan tugas • Ketepatan waktu pengumpulan tugas • <i>Correct in understanding, answers and analysis</i> • <i>Able to explain the assignments</i> • <i>On time submission of assignments.</i>	Non-tes : Tugas 2: Tugas tertulis mengenai teknologi assistif untuk disabilitas tuna rungu Non-test : Task 2: <i>Written assignment regarding assistive technology for deaf disabilities</i>	• Kuliah dan brainstorming, tanya jawab. 2x[TM: 3 x 50"] 2x[BM: 3 x 50"] 2x[PT : 3x 50"] • <i>Presentation and brainstorming, ask and answer.</i> 2x[FF : 3 x 50"] 2x[SA : 3 x 50"] 2x[SS : 3 x 50"]		• Teknologi assistif untuk disabilitas tuna rungu : pengenalan sistem auditori pada manusia, akustik pendengaran, anatomi dan fisiologi sistem auditori, klasifikasi hearing-loss, treatment (medis dan nonmedis), audiologi (metode pengukuran, pure-tone audiometry, immittance, Electric Response Audiometry (ERA), audiometric equipment design and calibration,	5

						artificial ears), induction-loop systems, infrared communication systems, telephone technology, alarm and alerting systems • Isu dan perkembangan terkini terkait peralatan assistif untuk tuna rungu • <i>Assistive technology for deaf disabilities: introduction to the auditory system in humans, auditory acoustics, auditory system anatomy and physiology, hearing-loss classification, treatment (medical and non-medical), audiology (measurement methods, pure-tone audiometry, immittance,</i>	
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						<i>Electric Response Audiometry (ERA), audiometric equipment design and calibration, artificial ears), induction-loop systems, infrared communication systems, telephone technology, alarm and alerting systems</i> • <i>Recent issues and developments regarding assistive equipment for the deaf</i>	
4 - 5	Mahasiswa memahami dan mampu menjelaskan tentang teknologi assistif untuk disabilitas tuna wicara <i>Students understand and are able to explain about assistive technology for mute disabilities</i>	• Kebenaran pemahaman, jawaban dan analisa • Keberhasilan menjelaskan tugas • Ketepatan waktu pengumpulan tugas • <i>Correct in understanding, answers and analysis</i>	Non-tes : Tugas 3: Tugas tertulis mengenai teknologi assistif untuk disabilitas tuna wicara Non-test : Task 3: <i>Written assignment regarding assistive technology for mute disabilities</i>	• Kuliah dan brainstorming, tanya jawab. 2x[TM: 3 x 50"] 2x[BM: 3 x 50"] 2x[PT : 3x 50"] • <i>Presentation and brainstorming, ask and answer.</i> 2x[FF : 3 x 50"] 2x[SA : 3 x 50"] 2x[SS : 3 x 50"]		• Teknologi assistif untuk disabilitas tuna wicara : pengenalan mekanisme produksi sinyal suara pada manusia (struktur organ, vocal tract, speech production model), intonasi dan fluktuasi suara, pemrosesan sinyal suara, sistem pengenalan suara,	5

		• <i>Able to explain the assignments</i> • <i>On time submission of assignments.</i>				electro-larynx (konsep dasar, analisa, perancangan), artificial larynx implant, voice synthesizer, Augmentative and Alternative Communication aids (AAC), Voice Output Communication Aids (VOCA) • Isu dan perkembangan terkini terkait peralatan assistif untuk tuna wicara • <i>Assistive technology for mute disabilities: recognition of speech signal production mechanisms in humans (organ structure, vocal tract, speech production model), voice intonation and fluctuation,</i>	
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						<i>speech signal processing, speech recognition systems, electro-larynx (basic concepts, analysis, design) , artificial larynx implant, voice synthesizer, Augmentative and Alternative Communication aids (AAC), Voice Output Communication Aids (VOCA)</i> • <i>Latest issues and developments related to assistive equipment for the mute disabilities</i>	
6-7	Mahasiswa memahami dan mampu menjelaskan tentang teknologi assistif untuk disabilitas tuna netra <i>Students understand and are able to explain about assistive technology for blind disabilities</i>	• Kebenaran pemahaman, jawaban dan analisa • Keberhasilan menjelaskan tugas • Ketepatan waktu pengumpulan tugas • <i>Correct in understanding, answers and analysis</i>	Non-tes : Tugas 4: Tugas tertulis mengenai teknologi assistif untuk disabilitas tuna netra Non-test : Task 4: <i>Written assignment regarding assistive</i>	• Kuliah dan brainstorming, tanya jawab. 2x[TM: 3 x 50"] 2x[BM: 3 x 50"] 2x[PT : 3x 50"] • <i>Presentation and brainstorming, ask and answer.</i>		• Teknologi assistif untuk disabilitas tuna netra : pengenalan tentang persepsi, sistem visual (mata), <i>sight measurement, haptic perceptual system</i>, teknologi	5

		• <i>Able to explain the assignments</i> • <i>On time submission of assignments.</i>	<i>technology for blind disabilities</i>	<i>2x[FF : 3 x 50"]</i> <i>2x[SA : 3 x 50"]</i> <i>2x[SS : 3 x 50"]</i>		untuk mobilitas dan navigasi, teknologi Braille (<i>electronic refreshable displays, writers, and note takers</i>) • Isu dan perkembangan terkini terkait peralatan assistif untuk tuna netra • <i>Assistive technology for blind disabilities: recognition of perception, visual system (eye), sight measurement, haptic perceptual system, technology for mobility and navigation, Braille technology (electronic refreshable</i>	
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						<i>displays, writers, and note takers)</i> Recent issues and developments related to assistive equipment for the blind	
8	EVALUASI TENGAH SEMESTER MID-SEMESTER EXAM						20
9 - 10	Mahasiswa memahami dan mampu menjelaskan tentang teknologi assistif untuk disabilitas tuna daksa. <i>Students understand and are able to explain about assistive technology for the disabled.</i>	- Kebenaran pemahaman, jawaban dan analisa - Keberhasilan menjelaskan tugas - Ketepatan waktu pengumpulan tugas - Correct in understanding, answers and analysis - Able to explain the assignments - On time submission of assignments.	Non-tes : Tugas 5: Tugas tertulis mengenai teknologi assistif untuk disabilitas tuna daksa Non-test : Task 5: Written assignment regarding assistive technology for disabled	- Kuliah dan brainstorming, tanya jawab. 2x[TM: 3 x 50"] 2x[BM: 3 x 50"] 2x[PT : 3x 50"] - Presentation and brainstorming, ask and answer. 2x[FF : 3 x 50"] 2x[SA : 3 x 50"] 2x[SS : 3 x 50"]		Teknologi assistif untuk disabilitas tuna daksa : sistem gerak pada manusia, gangguan gerak dan penyebabnya (neuro-muskular, struktur tulang, penyakit, kecelakaan), pengenalan sistem pengukuran gerak pada manusia, kursi roda elektrik (<i>wheelchair and mobility aids</i>), eksoskeleton, special seating and	5

						<i>positioning, ortosis dan prosthesis</i> • Isu dan perkembangan terkini terkait peralatan assistif untuk tuna daksa • <i>Assistive technology for disabled people: motion systems in humans, movement disorders and their causes (neuro-muscular, bone structure, disease, accidents), introduction to motion measurement systems in humans, electric wheelchairs (wheelchair and mobility aids), exoskeleton,</i>	
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						<i>special seating and positioning, orthosis and prosthesis</i> • <i>Latest issues and developments related to assistive equipment for the disabled</i>	
11 -12	Mahasiswa memahami dan mampu menjelaskan tentang teknologi assistif untuk disabilitas tuna grahita <i>Students understand and are able to explain about assistive technology for mentally disabled people</i>	• Kebenaran pemahaman, jawaban dan analisa • Keberhasilan menjelaskan tugas • Ketepatan waktu pengumpulan tugas • <i>Correct in understanding, answers and analysis</i> • <i>Able to explain the assignments</i> • <i>On time submission of assignments.</i>	Non-tes : Tugas 6: Tugas tertulis mengenai teknologi assistif untuk disabilitas tuna grahita Non-test : Task 6: <i>Written assignment regarding assistive technology for mentally disabled</i>	• Kuliah dan brainstorming, tanya jawab. 2x[TM: 3 x 50"] 2x[BM: 3 x 50"] 2x[PT : 3x 50"] • <i>Presentation and brainstorming, ask and answer.</i> 2x[FF : 3 x 50"] 2x[SA : 3 x 50"] 2x[SS : 3 x 50"]		• Teknologi asistif untuk disabilitas tuna grahita : pengenalan tentang tuna grahita, klasifikasi kelainan, (cognition and learning disabilities), computer software for learning and recording, telecare and home monitoring systems (SOS call alarm), electronic pre-recorded voice memory aid and timed reminder • Isu dan perkembangan	5

						terkini terkait peralatan assistif untuk tuna grahita • <i>Assistive technology for mentally disabled: introduction to the mentally disabled, classification of disorders, (cognition and learning disabilities), computer software for learning and recording, telecare and home monitoring systems (SOS call alarm), electronic pre-recorded voice memory aid and timed reminder</i> • <i>Recent issues and developments related to assistive equipment for the mentally disabled</i>	
13-15	Mahasiswa memahami dan mampu menjelaskan tentang teknologi welfar untuk fasilitas publik dan pelayanan	• Kebenaran pemahaman, jawaban dan analisa	Non-tes : Tugas 7: Tugastertulis mengenai	• Kuliah dan brainstorming, tanya jawab. 2x[TM: 3 x 50"]		• Teknologi welfar untuk fasilitas publik dan pelayanan social,	30

	social, isu dan perkembangan terkini <i>Students understand and are able to explain about Welfar technology for public facilities and social services, the latest issues and developments</i>	• Keberhasilan menjelaskan tugas • Ketepatan waktu pengumpulan tugas • <i>Correct in understanding, answers and analysis</i> • <i>Able to explain the assignments</i> • <i>On time submission of assignments.</i>	teknologi welfar untuk fasilitas publik dan pelayanan social, isu dan perkembangan terkini Presentasi : Penentuan tema presentasi diberikan pada minggu ke – 9. Proses presentasi dilakukan pada minggu ke – 14-15 Non-test : Task 7 : <i>Written assignment regarding welfare technology for public facilities and social services, current issues and developments</i> Presentation <i>The theme for the presentation was given in the 9th week. The</i>	2x[BM: 3 x 50"] 2x[PT : 3x 50"] • <i>Presentation and brainstorming, ask and answer.</i> 2x[FF : 3 x 50"] 2x[SA : 3 x 50"] 2x[SS : 3 x 50"]		hukum, etika, isu dan perkembangan terkini • <i>Welfar technology for public facilities and social services, law, ethics, current issues and developments</i>	
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			<i>presentation process was carried out in the 14-15th week</i>				
16	EVALUASI AKHIR SEMESTER FINAL-SEMESTER EXAM						20

TM=Tatap Muka, **PT**=Penugasan Terstruktur, **BM**=Belajar Mandiri.
FF = Face to Face, **SA** = Structured Assignment, **SS** = Self Study.

II. Rencana Asesmen & Evaluasi (RAE) / *Assessment & Evaluation Plan*

	ASSESSMENT & EVALUATION PLAN BACHELOR DEGREE PROGRAM OF BIOMEDICAL ENGINEERING - FTEIC ITS Course : Assistive and Welfare Technologies		RA&E
			Write Doc Code
Kode/code: EB184904	Bobot sks/credits (T/P): 3/0	Rumpun MK: Biocybernetics Course Cluster: Biocybernetics	Peminatan <i>Specialization</i>
OTORISASI <i>AUTHORIZATION</i>	Penyusun RA & E <i>Compiler A&EP</i> Dr. Achmad Arifin, S.T., M.Eng.	Koordinator RMK <i>Course Cluster Coordinator</i> Ir. Josaphat Pramudijanto, M.Eng.	Ka DEP <i>Head of DEP</i> Dr. Achmad Arifin, S.T., M.Eng.

Mg ke/ Week (1)	Sub CP-MK / Lesson Learning Outcomes (LLO) (2)	Bentuk Asesmen (Penilaian) Form of Assessment (3)	Bobot / Load (%) (4)
1	Sub CP-MK 1: Mahasiswa memahami dan mampu menjelaskan tentang disabilitas, sejarah dan perkembangan teknologi assistif dan welfar LLO 1: <i>Students understand and are able to explain disabilities, the history and development of assistive and self-help technology..</i>	Non-tes : Tugas 1 - Tugas tertulis mengenai disabilitas, sejarah dan perkembangan teknologi assistif dan welfar. Tes: Soal 1 pada ETS Non-tes Task 1 <i>Written assignments regarding disabilities, history and development of assistive and welfar</i> Test: <i>Question 1 in Mid Exam</i>	5
2-3	Sub CP-MK 2:	Non-tes : Tugas 2:	5

	Mahasiswa memahami dan mampu menjelaskan tentang teknologi assistif untuk disabilitas tuna rungu LLO 2: <i>Students understand and able to explain about assistive technology for deaf disabilities</i>	Tugas tertulis mengenai teknologi assistif untuk disabilitas tuna wicara Tes: Soal 2 dan 3 Pada ETS Non-test : Task 2: <i>Written assignment regarding assistive technology for mute disabilities</i> Test: <i>Question 2 and 3 in Mid Exam</i>	
4-5	Sub CP-MK 3: Mahasiswa memahami dan mampu menjelaskan tentang teknologi assistif untuk disabilitas tuna wicara LLO 3: <i>Students understand and are able to explain about assistive technology for mute disabilities</i>	Non-tes : Tugas 3: Tugas tertulis mengenai teknologi assistif untuk disabilitas tuna wicara Tes: Soal 4 pada ETS Non-test : Task 3: <i>Written assignment regarding assistive technology for mute disabilities</i> Test: <i>Question 4 in Mid Exam</i>	5
6-7	Sub CP-MK 4: Mahasiswa memahami dan mampu menjelaskan tentang teknologi assistif untuk disabilitas tuna netra LLO 4: <i>Students understand and</i>	Non-tes : Tugas 4: Tugas tertulis mengenai teknologi assistif untuk disabilitas tuna netra Tes: Soal 5 dan 6 pada ETS Soal 1 pada EAS Non-test : Task 4: <i>Written assignment regarding assistive technology for blind disabilities</i> Test:	5

	<i>are able to explain about assistive technology for blind disabilities</i>	<i>Question 5 and 6 in Mid Exam Question 1 in Final Exam</i>	
8	Evaluasi Tengah Semester Mid Exam	Tes: Ujian Tulis/Ujian Daring Test: <i>Writing Exams / Online Exams</i>	20
9-10	Sub CP-MK 5: Mahasiswa memahami dan mampu menjelaskan tentang teknologi assistif untuk disabilitas tuna daksa. LLO 5: <i>Students understand and are able to explain about assistive technology for the disabled.</i>	Non-tes : Tugas 5: Tugas tertulis mengenai teknologi assistif untuk disabilitas tuna daksa Tes: Soal 2 pada EAS Non-test : Task 5: <i>Written assignment regarding assistive technology for disabled</i> Test: <i>Question 2 in Final Exam</i>	5
12	Sub CP-MK 6: Mahasiswa memahami dan mampu menjelaskan tentang teknologi assistif untuk disabilitas tuna grahita LLO 6: <i>Students understand and are able to explain about assistive technology for mentally disabled people</i>	Non-tes : Tugas 6: Tugas tertulis mengenai teknologi assistif untuk disabilitas tuna grahita Tes: Soal 3 dan 4 pada EAS Non-test : Task 6: <i>Written assignment regarding assistive technology for mentally disabled</i> Test: <i>Question 3 and 4 in Final Exam</i>	5

14	Sub CP-MK 7: Mahasiswa memahami dan mampu menjelaskan tentang teknologi welfar untuk fasilitas publik dan pelayanan social, isu dan perkembangan terkini LLO 7: <i>Students understand and are able to explain about Welfar technology for public facilities and social services, the latest issues and developments</i>	Non-tes : Tugas 7 : Tugas tertulis mengenai teknologi welfar untuk fasilitas publik dan pelayanan social, isu dan perkembangan terkini Presentasi : Penentuan tema presentasi diberikan pada minggu ke – 9. Proses presentasi dilakukan pada minggu ke – 14-15 Tes: Soal 5 dan 6 pada EAS Non-test : Task 7 : <i>Written assignment regarding welfare technology for public facilities and social services, current issues and developments</i> Presentation <i>The theme for the presentation was given in the 9th week. The presentation process was carried out in the 14-15th week</i> Test: <i>Question 5 and 6 in Final Exam</i>	30
16	Evaluasi Akhir Final Exam	Tes: Ujian Tulis/Ujian Daring Test: <i>Writing Exams / Online Exams</i>	20
Total bobot penilaian Total assessment load			100%

● **Indikator Pencapaian CPL Pada MK / *Indicator of PLO achievement charged to the course***

CPL yang dibebankan pada MK / <i>PLO charged to the course</i>	CPMK / <i>Course Learning Outcome (CLO)</i>	Minggu ke / <i>Week</i>	Bentuk Asesmen / <i>Form of Assessment</i>	Bobot / <i>Load (%)</i>
CPL-02 / <i>PLO-02</i>	CPMK 1 / <i>CLO 1</i>	Week- 1	Task 1	5
		Week- 8	Mid Exam Question 1	4
CPL-03 / <i>PLO-03</i>	CPMK 4 / <i>CLO 4</i>	Week- 6-7	Task 4	5
		Week 8	Mid Exam Question 5 and 6	6
		Week- 16	Final Exam Question 1	4
	CPMK 5 / <i>CLO 5</i>	Week- 9-10	Task 5	5
		Week 16	Final Exam Question 2	4
CPL-05 / <i>PLO-05</i>	CPMK 2 / <i>CLO 2</i>	Week- 2-3	Task 2	5
		Week- 8	Mid Exam Question 2 and 3	6
	CPMK 3 / <i>CLO 3</i>	Week- 4-5	Task 3	5
		Week- 8	Mid Exam Question 4	4
	CPMK 6 / <i>CLO 6</i>	Week- 11-12	Task 6	5
		Week 16	Final Exam Question 3 and 4	6
CPL-06 / <i>PLO-06</i>	CPMK 7 / <i>CLO 7</i>	Week 14-15	Task 7	5
		Week 14-15	Presentation	25
		Week 16	Final Exam Question 5 and 6	6
				$\Sigma = 100\%$

No	Form of Assessment	PLO-01	PLO-02	PLO-03	PLO-04	PLO-05	PLO-06	PLO-07	PLO-08	PLO-09	PLO-10	PLO-11	PLO-12	Total
1	Task 1		0.05											0.05
2	Task 2					0.05								0.05
3	Task 3					0.05								0.05
4	Task 4			0.05										0.05
5	Task 5			0.05										0.05
6	Task 6					0.05								0.05
7	Task 7						0.05							0.05
8	Presentation						0.25							0.25
9	Mid Exam		0.04	0.06		0.10								0.20
10	Final Exam			0.08		0.06	0.06							0.20
	Total		0.09	0.24		0.31	0.36							1