



MODULE HANDBOOK MEDICAL DATABASE AND OPTIMIZATION



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

INSTITUT TEKNOLOGI SEPULUH NOPEMBER



MODULE HANDBOOK
Medical Database and Optimization
DEPARTMENT OF BIOMEDICAL ENGINEERING

INSTITUT TEKNOLOGI SEPULUH NOPEMBER
Number : 6864/IT2.IX.5.1.2/B/PP.03.00.00/2023

ENDORSEMENT PAGE

Proses Process	Penanggung Jawab Person in Charge			Tanggal Date
	Nama Name	Jabatan Position	Tandatangan Signature	
Perumus <i>Preparation</i>	Ir. Siti Halimah Baki, M.T.	Dosen <i>Lecturer</i>		November 18, 2022
Pemeriksa dan Pengendalian <i>Review and Control</i>	Dr. Achmad Arifin, S.T., M.Eng.	Tim kurikulum <i>Curriculum team</i>		November 20, 2022
Persetujuan <i>Approval</i>	Ir. Josaphat Pramudijanto, M.Eng.	Koordinator RMK <i>Course Cluster Coordinator</i>		April 13, 2023
Penetapan <i>Determination</i>	Dr. Achmad Arifin, S.T., M.Eng.	Kepala Departemen <i>Head of Department</i>		April 17, 2023

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MODULE HANDBOOK

MEDICAL DATABASE AND OPTIMIZATION

Module name	Medical Database and Optimization	
Module level	Undergraduate	
Code	EB234911	
Course (if applicable)	Probability and Statistics	
Semester	Specialization	
Person responsible for the module	Norma Hermawan, S.T., M. T.	
Lecturer	Norma Hermawan, S.T., M. T.	
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 : 3 x 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	<p>Course Learning Outcome (CLO) after completing this module,</p> <p>CLO 1: Students are able to describe the relationship between clinical data</p> <p>CLO 2: students can use electronic health records to make clinical decision aids (eg comparing different treatment techniques).</p> <p>CLO 3: Students are able to design medical database (patient registration, repository of error medication, medical history, etc).</p> <p>CLO 4: Students are able to import, export and linking data table across platform .</p> <p>CLO 5: Students can create queries and reports to describe complicated laws between fields (variables) in the health database.</p> <p>CLO 6: Students can analyze, merge, and query health databases to generate new information.</p>	<p>PLO-02</p> <p>PLO-06</p> <p>PLO-06</p> <p>PLO-03</p> <p>PLO-06</p> <p>PLO-03</p>

	CLO 7: Students can optimize data structures and tables that eliminate duplication, unused data entry, and data obscurity.	PLO-08
Content	This course studies understanding about history of database and database type with database implementation for medical application and optimize and database uses for assist doctor in making clinical decision.	
Study and examination requirements and forms of examination	<ul style="list-style-type: none"> ● In-class exercises ● Assignment 1, 2, 3 ● Mid-term examination ● Final examination 	
Media employed	LCD, whiteboard, websites (myITS Classroom), zoom.	
Reading list	<p>Main :</p> <ol style="list-style-type: none"> 1. Kathryn J. Hannah, Marion J. Ball (Ed.), <i>Computer Medical Databases: The First Six Decades (1950–2010)</i>. Springer, London, 2012. 2. Robert Sheldon, Geoff Moes, <i>Beginning MySQL®</i>. Wiley Publishing, Inc., Indianapolis, 2005. 3. Michael J. Hernandez, <i>Database Design for Mere Mortals: A Hands-On Guide to Relational Database Design (3rd Edition)</i>. Addison-Wesley, New Jersey, 2013. <p>Supporting :</p> <p>-</p>	

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) COURSE	KODE CODE	Rumpun MK Course Cluster	BOBOT (sks) Credits		SEMESTER	Tgl Penyusunan Compilation Date
Database Medika dan Optimasi <i>Medical Database and Optimization</i>	EB234911	Ilmu Dasar Teknik <i>Basic Engineering</i>	T=3	P=0	Specializat ion	Nov 9, 2023
OTORISASI / PENGESAHAN AUTHORIZATION / ENDORSEMENT	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>	
	(Nada Fitriyatul Hikmah, S.T, M.T)		(M. Hilman Fatoni, S.T., M.T.)		(Dr. Achmad Arifin, S.T., M.Eng.)	
Capaian Pembelajaran	CPL-PRODI yang dibebankan pada MK PLO Program Charged to The Course					
Learning Outcomes	CPL-02	Mampu menemukan, memahami, menjelaskan, merumuskan, dan menyelesaikan permasalahan umum pada bidang Teknik dan permasalahan khusus pada bidang Teknik Biomedika yang meliputi instrumentasi biomedika cerdas, teknik rehabilitasi medika, pencitraan dan pengolahan citra medika, serta informatika medika				
	PLO-02	<i>Able to find, understand, explain, formulate, and solve general problems in the field of Engineering and special problems in the field of Biomedical Engineering which includes intelligent biomedical instrumentation, medical rehabilitation techniques, imaging and processing of medical images, and medical informatics</i>				
	CPL-03	Mampu merancang dan melaksanakan eksperimen laboratorium dan/atau lapangan, menganalisa dan menginterpretasi data, serta menggunakan penilaian yang obyektif untuk menarik kesimpulan				
	PLO-03	<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-06	Mampu menerapkan ilmu pengetahuan, keterampilan, dan metode terkini dalam menyelesaikan permasalahan di bidang Teknik Biomedika
	PLO-06	<i>Able to apply the latest knowledge, skills and methods in solving problems in the field of Biomedical Engineering</i>
	CPL-08	Mampu bekerja dalam tim lintas disiplin dan budaya serta bertanggung jawab kepada masyarakat dan mematuhi hukum dan etika profesi dalam menyelesaikan masalah Teknik Biomedika
	PLO-08	<i>Able to work in interdisciplinary and intercultural teams and be responsible to the community and comply with legal and professional ethics in solving Biomedical Engineering problems</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 mampu menggambarkan hubungan antar data klinis. <i>Students are able to describe the relationship between clinical data.</i>
	CP MK 2 CLO 2	Mahasiswa dapat menggunakan catatan kesehatan elektronik untuk membuat bantuan keputusan klinis (misl. Membandingkan berbagai teknik pengobatan). <i>Students can use electronic health records to make clinical decision aids (eg comparing different treatment techniques).</i>
	CP MK 3 CLO 3	Mahasiswa mampu mendesain database kesehatan (pendaftaran pasien, repository kesalahan pengobatan, riwayat kesehatan, dll.) <i>Students are able to design medical database (patient registration, repository of error medication, medical history, etc).</i>
	CP MK 4 CLO 4	Mahasiswa dapat melakukan import, Export, dan menghubungkan table data lintas platform. <i>Students are able to import, export and linking data table across platform .</i>
	CP MK 5 CLO 5	Mahasiswa dapat membuat queries dan reports untuk menggambarkan hukum rumit diantara field(variable) di database kesehatan. <i>Students can create queries and reports to describe complicated laws between fields (variables) in the health database.</i>
	CP MK 6 CLO 6	Mahasiswa dapat menganalisis, melakukan merge dan query database kesehatan untuk menghasilkan informasi baru. <i>Students can analyze, merge, and query health databases to generate new information.</i>
	CP MK 7 CLO 7	Mahasiswa dapat mengoptimisasi struktur data dan table yang mengeliminir duplikasi, entri data tak terpakai, dan ketidakjelasan data. <i>Students can optimize data structures and tables that eliminate duplication, unused data entry, and data obscurity.</i>

Peta CPL – CP MK		CPL-01	CPL-02	CPL-03	CPL-04	CPL-05	CPL-06	CPL-07	CPL-08	CPL-09	CPL-10	CPL-11	CPL-12
<i>Map of PLO - CLO</i>	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 6 <i>CLO 7 / LLO 6</i>								✓				
Diskripsi Singkat MK	Pemahaman tentang sejarah dan jenis-jenis database serta ketrampilan teknik implementasi database untuk aplikasi medis serta penggunaan dan optimasi database untuk membantu dokter dalam membuat keputusan klinis.												
Short Description of Course	<i>This course studies understanding about history of database and database type with database implementation for medical application and optimize and database uses for assist doctor in making clinical decision.</i>												

Bahan Kajian: Materi pembelajaran Course Materials:	<ol style="list-style-type: none"> 1. Pengantar evolusi database/<i>Introduction To Database Evolution</i> 2. Riwayat kesehatan elektronik/<i>Electronic Medical history</i> 3. Menentukan persyaratan sistem/<i>Determine system requirement</i> 4. Pemodelan data (ER diagram)/<i>Data Modelling</i> 5. Table dan record/<i>Table and record</i> 6. Query 7. Bahasa Query Standar (DDL & DML) 8. Pemodelan relationship/<i>Modelling Relationship</i> 9. Relationship dan primary key/<i>Relationship and Primary key</i> 10. Normalisasi database/<i>Database Normalization</i> 																			
Pustaka References	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #e0e0e0;">Utama / Main:</td> <td colspan="4"></td> </tr> <tr> <td></td> <td colspan="4"> <ol style="list-style-type: none"> 1. Kathryn J. Hannah, Marion J. Ball (Ed.), <i>Computer Medical Databases: The First Six Decades (1950-2010)</i>. Springer, London, 2012. 2. Robert Sheldon, Geoff Moes, <i>Beginning MySQL®</i>. Wiley Publishing, Inc., Indianapolis, 2005. 3. Michael J. Hernandez, <i>Database Design for Mere Mortals: A Hands-On Guide to Relational Database Design (3rd Edition)</i>. Addison-Wesley, New Jersey, 2013. </td> </tr> <tr> <td style="background-color: #e0e0e0;">Pendukung / Supporting:</td> <td colspan="4"></td> </tr> </table>					Utama / Main:						<ol style="list-style-type: none"> 1. Kathryn J. Hannah, Marion J. Ball (Ed.), <i>Computer Medical Databases: The First Six Decades (1950-2010)</i>. Springer, London, 2012. 2. Robert Sheldon, Geoff Moes, <i>Beginning MySQL®</i>. Wiley Publishing, Inc., Indianapolis, 2005. 3. Michael J. Hernandez, <i>Database Design for Mere Mortals: A Hands-On Guide to Relational Database Design (3rd Edition)</i>. Addison-Wesley, New Jersey, 2013. 				Pendukung / Supporting:				
Utama / Main:																				
	<ol style="list-style-type: none"> 1. Kathryn J. Hannah, Marion J. Ball (Ed.), <i>Computer Medical Databases: The First Six Decades (1950-2010)</i>. Springer, London, 2012. 2. Robert Sheldon, Geoff Moes, <i>Beginning MySQL®</i>. Wiley Publishing, Inc., Indianapolis, 2005. 3. Michael J. Hernandez, <i>Database Design for Mere Mortals: A Hands-On Guide to Relational Database Design (3rd Edition)</i>. Addison-Wesley, New Jersey, 2013. 																			
Pendukung / Supporting:																				
Dosen Pengampu Lecturers	Norma Hermawan, S.T., M. T.																			
Matakuliah syarat Prerequisite	-																			
Mg ke/ Week		Penilaian / Assessment	Bantuk Pembelajaran; Metode Pembelajaran; Penugasan Mahasiswa;	Materi Pembelajaran [Pustaka] /	Bobot Penilaian															

	Kemampuan akhir tiap tahapan belajar (Sub-CPMK) / <i>Final ability of each learning stage (LLO)</i>	Indikator / <i>Indicator</i>	Kriteria & Teknik / <i>Criteria & Techniques</i>	[<i>Estimasi Waktu</i>] / <i>Form of Learning; Learning Method; Student Assignment; [Estimated Time</i>		<i>Learning Material [Reference]</i>	<i>/Assessment Load (%)</i>
(1)	(2)	(3)	(4)	Tatap Muka / <i>In-class (5)</i>	Daring / <i>Online (6)</i>	(7)	(8)
1,2	Mahasiswa mampu menggambarkan hubungan antar data klinis. <i>Students are able to describe the relationship between clinical data</i>	<ul style="list-style-type: none"> Mahasiswa mampu memahami dan menjelaskan evolusi database <i>Student able to interpret and explain about database evolution</i> 	<p>Non-tes : Diskusi Tugas Presentasi</p> <p>Non-test : <i>Discussion Assignment Presentation</i></p>	<ul style="list-style-type: none"> Kuliah dan diskusi [TM : 3 x 50"] [BM : 3 x 50"] [PT : 3 x 50"] <i>Presentation and brainstorming.</i> [FF : 3 x 50"] [SA : 3 x 50"] [SS : 3 x 50"] 	<ul style="list-style-type: none"> Belajar mandiri melalui Share ITS. <i>Self learning through Share ITS</i> 	<ul style="list-style-type: none"> Pengantar evolusi database <i>Introduction to database evolution</i> 	5
3-4	Mahasiswa dapat menggunakan catatan kesehatan elektronik untuk membuat bantuan keputusan	<ul style="list-style-type: none"> Mahasiswa dapat membandingkan riwayat kesehatan 	<p>Non-tes : Diskusi Tugas Presentasi</p>	<ul style="list-style-type: none"> Kuliah dan diskusi [TM : 3 x 50"] [BM : 3 x 50"] 	<ul style="list-style-type: none"> Belajar mandiri melalui Share ITS. 	Riwayat kesehatan elektronik	4

	<p>klinis (misl. Membandingkan berbagai teknik pengobatan.</p> <p><i>Students can use electronic health records to make clinical decision aids (eg comparing different treatment techniques).</i></p>	<p>elektronik dan membuat bantuan keputusan klinis</p> <ul style="list-style-type: none"> • <i>Students can compare electronic medical history and make clinical decision aids</i> 	<p>Non-test : Discussion Assignment Presentation</p>	<p>[PT : 3 x 50"]</p> <ul style="list-style-type: none"> • <i>Presentation and brainstorming.</i> [FF : 3 x 50"] [SA : 3 x 50"] [SS : 3 x 50"] 	<ul style="list-style-type: none"> • <i>Self learning through Share ITS</i> 	<p><i>Electronic medical history</i></p>	
5	<p>Mahasiswa mampu mendesain database kesehatan(pendaftaran pasien, repository kesalahan pengobatan, riwayat kesehatan, dll.)</p> <p><i>Students are able to design medical database (patient registration, repository of error medication, medical history, etc).</i></p>	<ul style="list-style-type: none"> • Mahasiswa mampu memahami dan menentukan persyaratan sistem pemodelan data ER • <i>Student able to understand and determine system requirement data modelling ER</i> 	<p>Non-tes : Diskusi Tugas Presentasi</p> <p>Non-test : Discussion Assignment Presentation</p>	<ul style="list-style-type: none"> • Kuliah dan diskusi [TM : 3 x 50"] [BM : 3 x 50"] [PT : 3 x 50"] • <i>Presentation and brainstorming.</i> [FF : 3 x 50"] [SA : 3 x 50"] [SS : 3 x 50"] 	<ul style="list-style-type: none"> • Belajar mandiri melalui Share ITS. • <i>Self learning through Share ITS</i> 	<p>Menentukan persyaratan sistem Pemodelan data (ER diagram)</p> <p><i>Determining data model system requirement (ER diagram</i></p>	12
6-7	<p>Mahasiswa dapat melakukan import, Export, dan menghubungkan table data lintas platform.</p>	<ul style="list-style-type: none"> • Mahasiswa mampu membuat dan menjelaskan table dan query • <i>Student able to make and explain table and query</i> 	<p>Non-tes : Diskusi Tugas praktikum</p> <p>Non-test : Discussion Assignment</p>	<ul style="list-style-type: none"> • Kuliah dan diskusi [TM : 3 x 50"] [BM : 3 x 50"] [PT : 3 x 50"] • <i>Lecturing and discussion.</i> 	<ul style="list-style-type: none"> • Belajar mandiri melalui Share ITS. • <i>Self learning through Share ITS</i> 	<p>Table dan record Query</p> <p><i>Table and query record</i></p>	

	<i>Students are able to import, export and linking data table across platform</i>		<i>practicum</i>	<i>[FF : 3 x 50"] [SA : 3 x 50"] [SS : 3 x 50"]</i>			
8	EVALUASI TENGAH SEMESTER MID-SEMESTER EXAM						30
9 - 10	<p>Mahasiswa dapat membuat queries dan reports untuk menggambarkan hukum rumit diantara field(variable) di database kesehatan.</p> <p><i>Students can create queries and reports to describe complicated laws between fields (variables) in the health database.</i></p>	<ul style="list-style-type: none"> • Ketepatan waktu pengumpulan tugas • Kebenaran melaksanakan tugas • Keberhasilan menjelaskan tugas • Kebenaran jawaban dan analisis • Kelengkapan dan kerapian hasil laporan • Ketepatan waktu pengumpulan laporan praktikum • Kebenaran menjelaskan proyek praktikum • <i>On time submission of assignment</i> • <i>Correctness of the assignment</i> 	<p>Non-tes : Diskusi Tugas praktikum</p> <p>Non-test : <i>Discussion Assignment practicum</i></p>	<ul style="list-style-type: none"> • Kuliah dan diskusi [TM : 3 x 50"] [BM : 3 x 50"] [PT : 3 x 50"] • <i>Lecturing and discussion.</i> [FF : 3 x 50"] [SA : 3 x 50"] [SS : 3 x 50"] 	<ul style="list-style-type: none"> • Belajar mandiri melalui Share ITS. • <i>Self learning through Share ITS</i> 	• .	5


		<ul style="list-style-type: none"> • <i>Successfullness in explaining the assignment.</i> • <i>Answer and analysis correctness</i> • <i>Completeness and neatness of the report result</i> • <i>On time submission of practicum report</i> • <i>Correctness in explaining practicum project</i> 					
11 -12	<p>Mahasiswa dapat menganalisis, melakukan merge dan query database kesehatan untuk menghasilkan informasi baru.</p> <p>Students can analyze, merge, and query health databases to generate new information.</p>	<ul style="list-style-type: none"> • Ketepatan waktu pengumpulan tugas • Kebenaran melaksanakan tugas • Keberhasilan menjelaskan tugas • Kebenaran jawaban dan analisis • <i>On time submission of assignment</i> 	<p>Non-tes : Diskusi Tugas praktikum</p> <p>Non-test : <i>Discussion Assignment practicum</i></p>	<ul style="list-style-type: none"> • Kuliah dan diskusi [TM : 3 x 50"] [BM : 3 x 50"] [PT : 3 x 50"] • <i>Lecturing and discussion.</i> [FF : 3 x 50"] [SA : 3 x 50"] [SS : 3 x 50"] 	<ul style="list-style-type: none"> • Belajar mandiri melalui Share ITS. • <i>Self learning through Share ITS</i> 	<ul style="list-style-type: none"> • Pemodelan relationship dan primary key • <i>Relationship modelling and primary key.</i> 	5

		<ul style="list-style-type: none"> • <i>Correctness of the assignment</i> • <i>Successfullness in explaining the assignment.</i> • <i>Answer and analysis correctness.</i> 					
13-14	<p>Mahasiswa dapat mengoptimisasi struktur data dan table yang mengeliminir duplikasi, entri data tak terpakai, dan ketidakjelasan data.</p> <p>Students can optimize data structures and tables that eliminate duplication, unused data entry, and data obscurity</p>	<ul style="list-style-type: none"> • Ketepatan waktu pengumpulan tugas • Kebenaran melaksanakan tugas • Keberhasilan menjelaskan tugas • Kebenaran jawaban dan analisis • Kelengkapan dan kerapian hasil laporan • Ketepatan waktu pengumpulan laporan praktikum • Kebenaran menjelaskan proyek praktikum • <i>On time submission of assignment</i> 	<p>Non-tes : Diskusi Tugas praktikum</p> <p>Non-test : <i>Discussion Assignment practicum</i></p>	<ul style="list-style-type: none"> • Kuliah dan diskusi [TM : 3 x 50"] [BM : 3 x 50"] [PT : 3 x 50"] • <i>Lecturing and discussion.</i> [FF : 3 x 50"] [SA : 3 x 50"] [SS : 3 x 50"] 	<ul style="list-style-type: none"> • Belajar mandiri melalui Share ITS. • <i>Self learning through Share ITS</i> 	<ul style="list-style-type: none"> • Normalisasi database • <i>Database normalization</i> 	

		<ul style="list-style-type: none"> • <i>Correctness of the assignment</i> • <i>Successfullness in explaining the assignment.</i> • <i>Answer and analysis correctness</i> • <i>Completeness and neatness of the report result</i> • <i>On time submission of practicum report</i> • <i>Correctness in explaining practicum project</i> 					
15-16	EVALUASI AKHIR SEMESTER FINAL-SEMESTER EXAM						40

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 : Medical Database and Optimization		RA&E
			Write Doc Code
Kode/code: EB234911	Bobot sks/credits (T/P): 3/0	Rumpun MK: Ilmu Dasar Teknik Course Cluster: Basic Engineering	Smt: selection
OTORISASI AUTHORIZATION	Penyusun RA & E Compiler A&EP Nada Fitrieyatul H, S.T, M.T	Koordinator RMK Course Cluster Coordinator Muhammad Hilman Fatoni, S.T., M.T.	Ka DEP Head of DEP 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)
1,2	Sub CP-MK 1: Mahasiswa mampu menggambarkan hubungan antar data klinis LLO 1: <i>Students are able to describe the relationship between clinical data.</i>	Non-tes : Tugas 1 tahap 1 Non-test : <i>Assignment 1 stage 1</i>	Tugas 1/assignment 1 :5%
3,4	Sub CP-MK 2: Mahasiswa dapat menggunakan catatan kesehatan elektronik untuk membuat bantuan keputusan klinis (mis. Membandingkan berbagai teknik pengobatan). LLO 2: <i>Students can use electronic health records to make</i>	Non-tes : Tugas 2: Non-test : Assignment 2:	Tugas 2/assignment 2: 5%

	<i>clinical decision aids (eg comparing different treatment techniques).</i>		
5	<p>Sub CP-MK 3: Mahasiswa mampu mendesain database kesehatan (pendaftaran pasien, repository kesalahan pengobatan kesehatan, dll.)</p> <p>LLO 3: <i>Students are able to design medical database (patient registration, repository of error medication, medical history, etc).</i></p>	<p>Non-tes : Tugas 3: presentasi</p> <p>Non-test : <i>Assignment 3 Presentation.</i></p>	<p>Tugas 1/assignment 2 :5%</p> <p>Presentasi/ Presentation: 10%</p>
6,7	<p>Sub CP-MK 4: Mahasiswa dapat melakukan Import, export, and menghubungkan table data lintas platform.</p> <p>LLO 4: <i>Students are able to calculate interval estimates from averages and proportions of a population from one or two sample groups.</i></p>	<p>Non-tes : Tugas 4</p> <p>Non-test : Assignment 4</p>	<p>Tugas 1/assignment 4 :5%</p>
8	ETS	tes	15%
9,10	<p>Sub CP-MK 5: Mahasiswa dapat membuat queries dan reports untuk</p>	<p>Non-tes : Tugas 5:</p>	<p>Tugas 5/assignment 5 :5%</p>

	<p>menggambarkan hubungan rumit diantara field (variable) di database kesehatan.</p> <p>LLO 5: <i>Students are able to design and perform hypothesis tests for a population based on the number of sample groups.</i></p>	<p>Non-test: Assignment 5</p>	<p>Project:10 %</p>
11,12	<p>Sub CP-MK 6: Mahasiswa dapat menganalisis, melakukan merge, dan query database kesehatan untuk menghasilkan informasi baru</p> <p>LLO 6: <i>Students are able to determine the relationship between two or more variables.</i></p>	<p>Non Tes: Tugas 6</p> <p>Non Test: <i>Assignment 6</i></p>	<p>Tugas 6/assignment 6 :5%</p>
13,14	<p>Sub CP-MK 7 Mahasiswa dapat mengoptimisasi struktur data dan table yang mengeliminir duplikasi, entri data tak terpakai, dan ketidakjelasan data.</p> <p>LLO 7 Students can optimize data structures and tables that eliminate duplication, unused</p>	<p>Non Tes: Tugas 7</p> <p>Projek 2</p> <p>Non Test: <i>Assignment 7</i> <i>Project 2</i></p>	<p>Tugas 7/assignment 7 :5% Project:15 %</p>

	data entry, and data obscurity		
15	EAS	tes	15%
			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 / PLO-02	CPMK 1 / CLO 1	Week- 1-2	Assignment 1	5
CPL-03 / PLO-03	CPMK 4 / CLO 4	Week 6-7	Assignment 4	5
	CPMK 6 / CLO 6	Week- 11-12	Assignment 6	5
CPL-06/ PLO-06	CPMK 2 / CLO 2	Week- 3-4	Assignment 2	5
	CPMK 3 / CLO 3	Week- 5	Assignment 3, presentation	15
	CPMK 5 / CLO 5	Week- 9-10	Assignment 5, project 1	15
CPL-08/PLO-08	CPMK 7 / CLO 7	Week- 13-14	Assignment 7, project 2	20
				$\Sigma = 100\%$

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	Assignment 1		0.05											0.05
2	Assignment 2						0.05							0.05
3	Assignment 3						0.05							0.05
4	Assignment 4			0.05										0.05
5	Assignment 5						0.05							0.05
6	Assignment 6			0.05										0.05
7	Assignment 7								0.05					0.05
8	Presentation						0.1							0.1
9	Project 1						0.1							0.1
10	Project 2								0.15					0.15
11	Mid Exam													
12	Final Exam													
	Total		0.05	0.1			0.17		0.2					0.7

