MODULE HANDBOOK

DATABASE

STATISTICS UNDERGRADUATE PROGRAM
DEPARTMENT OF STATISTICS
FACULTY OF SCIENCE AND DATA ANALYTICS
INSTITUT TEKNOLOGI SEPULUH NOPEMBER
SURABAYA

ENDORSEMENT PAGE

	MODULE HANDBOOK **DATABASE** **STATISTICS UNDERGRADUATE PROGRAM** **DEPARTMENT OF STATISTICS** **INSTITUT TEKNOLOGI SEPULUH NOPEMBER**

Proses *Process*	Penanggung Jawab *Person in Charge*			Tanggal *Date*
	Nama *Name*	Jabatan *Position*	Tanda tangan *Signature*	
Perumus *Preparation*	Widhianingsih Tintrim Dwi Ary, S.Si., M.Stat., Ph.D.	Dosen Lecturer		
Pemeriksa dan Pengendalian *Review and Control*	Widhianingsih Tintrim Dwi Ary, S.Si., M.Stat., Ph.D. Dr. Kartika Fithriasari, M.Si	Tim kurikulum Curriculum team		
Persetujuan *Approval*	Prof. Nur Iriawan, MIKom., Ph.D	Koordinator RMK Course Cluster Coordinator		
Penetapan *Determination*	Dr. Kartika Fithriasari, M.Si	Kepala Departemen Head of Department		

MODULE HANDBOOK
DATABASE

Module name	DATABASE	
Module level	Undergraduate	
Code	SS234205	
Course (if applicable)	DATABASE	
Semester	2	
Person responsible for the module	Widhianingsih Tintrim Dwi Ary, S.Si., M.Stat., Ph.D.	
Lecturer	Widhianingsih Tintrim Dwi Ary, S.Si., M.Stat., Ph.D. Dr. Kartika Fithriasari, M.Si	
Language	Bahasa Indonesia and English	
Relation to curriculum	Undergradute degree program, mandatory, 2nd semester.	
Type of teaching, contact hours	Team Based Project (25%) Other SCL Method (31.25%) Non-SCL Method (43.75%)	
Workload	1. Lectures [L] : 3 x 50 = 150 minutes perweek. 2. Exercises and Assignments [EA] : 3 x 60 = 180 minutes (3 hours) perweek. 3. Independent learning : 3 x 60 [IL]= 180 minutes (3 hours) per week	
Credit points	3 credit points (SKS) Equivalent to 4.8 ECTS	
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.	
Mandatory prerequisites	-	
Learning outcomes and their corresponding PLOs	CLO-1 Able to understand general concepts, relational model concepts, and relational concepts of entities in database systems CLO-2 Able to understand and execute commands and the Structure Query Language (SQL) programming language CLO-3 Able to understand and execute commands in SQL programming language CLO-4 Able to manage tables using the SQL programming language CLO-5 Able to use database system to solve statistical problems	PLO-6 PLO-7 PLO-7 PLO-6 PLO-7 PLO-6 PLO-7 PLO-8
Content	The database course is a computing subject that discusses data management with database systems. After taking this	

	course, students will have the competence to be able to understand concepts in databases, how to process data from one table and multi tables by using simple commands or using database software programming languages. In addition, students will also have the competence to apply database systems to solve statistical problems. In this course, students play an active role in (i) being able to form relational models in databases and (ii) being able to operate database software for data management. At the end of the lecture, students can use data software to solve statistical problems.
Assessment and its weight	Cognitive -Assignment (23%) Quiz (11%) Cognitive - Midterm Exam (15%) Simulator building project (30%) Simulator project presentation (21%)
Media employed	LCD, whiteboard, websites (myITS Classroom), zoom
Reading list	1. Database Systems: A Practical Approach to Design, Implementation, and Management (6th edition), 2015, T. Connoly and C. Begg, ISBN 9780132943260 2. Database Systems: Design, Implementation, and Management (9th edition), 2011, C. Coronel, S. Morris, and P. Robb. 3. Oracle® 12c: SQL, 2010, J. Casteel. ISBN: 9781305251038 4. Fundamentals of Database Systems (7th edition), 2016, R. Elmasri and S. B. Navathe, ISBN-10: 0133970779 & ISBN-13: 9780133970777

	INSTITUT TEKNOLOGI SEPULUH NOPEMBER **FAKULTAS SAINS DAN ANALITIKA DATA** **PROGRAM STUDI SARJANA STATISTIKA** **DEPARTEMEN STATISTIKA**	**Kode Dokumen**

RENCANA PEMBELAJARAN SEMESTER/ *SEMESTER LEARNING PLAN*

MATA KULIAH (MK)/ *Course*	**KODE/** *Code*	**Rumpun MK/** *Course Group*	**BOBOT (sks)/** *Weight (credit)*		**SEMESTER/** *Semester*	**Tgl Penyusunan/** *Drafting Date*
BASIS DATA/ *DATABASE*	SS234205	SKSD	**T=2**	**P=1**	II	11 Januari 2023/ *January 11, 2023*

OTORISASI/ *AUTHORIZATION*	**Pengembang RPS/** *RPS Developer*	**Koordinator RMK/** *Course Group Coordinator*	**Ketua PRODI/** *Head of Department*
	Widhianingsih Tintrim Dwi Ary, S.Si., M.Stat., Ph.D. Dr. Kartika Fithriasari, M.Si	Prof. Nur Iriawan, M.Ikom, Ph.D	Dr. Kartika Fithriasari, M.Si

Capaian Pembelajaran (CP)/ *Learning Achievement*

CPL-PRODI yang dibebankan pada MK/ *PLO*

CPL-6	Mampu merancang, mengumpulkan, dan melakukan manajemen data dengan metodologi yang tepat
CPL-7	Mampu menggunakan perangkat komputasi modern untuk menyelesaikan permasalahan statistik
CPL-8	Mampu menggunakan teknik komputasi untuk menyelesaikan permasalahan statistik
PLO-6	*Able to design, collect, and perform data management with the right methodology*
PLO-7	*Able to use modern computing devices to solve statistical problems*
PLO-8	*Able to use computational techniques to solve statistical problems*

Capaian Pembelajaran Mata Kuliah (CPMK)/ *CLO*

CPMK-1 Mampu memahami konsep umum, konsep model relasional, dan konsep relasional entitas dalam sistem basis data
CPMK-2 Mampu memahami dan menjalankan perintah dan bahasa pemrograman Structure Query Language (SQL)
CPMK-3 Mampu memahami dan menjalankan perintah dalam bahasa pemrograman SQL
CPMK-4 Mampu mengelola tabel menggunakan bahasa pemrograman SQL
CPMK-5 Mampu menggunakan sistem basis data untuk menyelesaikan permasalahan statistika
CLO-1 Able to understand general concepts, relational model concepts, and relational concepts of entities in database systems
CLO-2 Able to understand and execute commands and the Structure Query Language (SQL) programming language
CLO-3 Able to understand and execute commands in SQL programming language

	CLO-4 Able to manage tables using the SQL programming language *CLO-5 Able to use database system to solve statistical problems*
	Matrik CPL – CPMK *PLO-CLO Matrix* CLO | PLO-6 | PLO -7 | PLO -8 CLO -1 | V | | CLO -2 | | V | CLO -3 | | V | CLO -4 | V | V | CLO -5 | V | V | V
Deskripsi Singkat MK/ ***Course Description***	Mata kuliah basis data merupakan mata kuliah bidang komputasi yang membahas manajemen data dengan sistem basis data. Setelah mengikuti mata kuliah ini, mahasiswa akan memiliki kompetensi untuk dapat memahami konsep-konsep dalam basis data, cara pengolahan data dari satu tabel dan multi-tabel dengan menggunakan perintah sederhana maupun menggunakan bahasa pemrograman software basis data. Selain itu, mahasiswa juga akan memiliki kompetensi untuk menerapkan sistem basis data untuk menyelesaikan permasalahan statistika. Dalam mata kuliah ini, mahasiswa berperan aktif untuk (i) mampu membentuk model relasional dalam basis data dan (ii) mampu mengoperasikan software basis data untuk manajemen data. Di akhir perkuliahan, mahasiswa dapat memanfaatkan software data untuk menyelesaikan permasalahan statistika. *The database course is a computing subject that discusses data management with database systems. After taking this course, students will have the competence to be able to understand concepts in databases, how to process data from one table and multi tables by using simple commands or using database software programming languages. In addition, students will also have the competence to apply database systems to solve statistical problems. In this course, students play an active role in (i) being able to form relational models in databases and (ii) being able to operate database software for data management. At the end of the lecture, students can use data software to solve statistical problems.*
Bahan Kajian: Materi Pembelajaran/ ***Course Material***	Teknologi Informasi, Manajemen Data, Teknik Komputasi, Dta Processing (Pemrosesan Data), Deskripsi dan Eksplorasi Data *Information Technology, Data Management, Computational Technique, Data Processing, Data Description and Exploration*
Pustaka/ ***References***	**Utama/*Primary*:** 5. Database Systems: A Practical Approach to Design, Implementation, and Management (6th edition), 2015, T. Connoly and C. Begg, ISBN 9780132943260 **Pendukung/*Secondary*:**

	6. Database Systems: Design, Implementation, and Management (9th edition), 2011, C. Coronel, S. Morris, and P. Robb. 7. Oracle® 12c: SQL, 2010, J. Casteel. ISBN: 9781305251038 8. Fundamentals of Database Systems (7th edition), 2016, R. Elmasri and S. B. Navathe, ISBN-10: 0133970779 & ISBN-13: 9780133970777
Dosen Pengampu/ ***Lecturers***	Widhianingsih Tintrim Dwi Ary, S.Si., M.Stat., Ph.D. Dr. Kartika Fithriasari, S.Si., M.Si.
Matakuliah syarat/ ***Pre-requisite Course***	-

Mg Ke- ***Week***	**Kemampuan akhir tiap tahapan belajar (Sub-CPMK)** ***Final capability for each learning step***	**Penilaian** ***Evaluation***		**Bantuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [Estimasi Waktu]** ***Learning Format Learning Methods Assignment for Student [Estimated Time]***		**Materi Pembelajaran [Pustaka]** ***Learning Material [References]***	**Bobot Penilaian (%)** ***Evaluation Weight (%)***
		Indikator ***Indicator***	**Kriteria & Bentuk** ***Criteria and Format***	**Luring** ***Offline***	**Daring** ***Online***		
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
1	Mampu memahami konsep basis data *Able to understand the concept of database*	1.1 Dapat memahami dan menjelaskan konsep dasar basis data 1.2 Dapat mengidentifikasi kegunaan basis data dan penggunanya 1.3 Dapat memahami dan menjelaskan model data dan model	Tes – non tes (observasi aktivitas di kelas) *Test – non-test (observation and activity in class)*	Kuliah dan Praktikum Case Methods *Lectures and Practices Case Methods* **TM: 1×[2x50"]** **P: 1×[1x170"]** **BM: 1×[2×60"]**		1. Konsep dasar basis data: sistem file tradisional, sistem basis data, istilah dasar basis data, komponen basis data 2. Keuntungan dan kerugian penggunaan basis data, serta	5%

		konseptual *1.1 Able to understand and explain the basic concept of database* *1.2 Able to identify the usability of database and its users* *1.3 Able to understand and explain data model and conceptual model*		**PT: 1×[2×60"]**		pengguna basis data 3. Pengenalan model data dan model konseptual **[1-4] Bab 1** *1. Database basic concepts: traditional file systems, database systems, database basic terms, database components* *2. Advantages and disadvantages of using databases, as well as database users* *3. Introduction to data models and conceptual models* ***[1-4] Chapter I***	
2	Mampu memahami konsep model relasional basis data *Able to understand relational model concept of database*	2.1 Dapat memahami dan menjelaskan konsep dasar model relasional dalam basis data *2.1 Able to understand and explain the basic concept of relational model in database*	Tes – non tes (observasi aktivitas di kelas) *Test – non-test (observation and activity in class)*	Kuliah dan Praktikum Case Methods *Lectures and Practices Case Methods* **TM: 1×[2x50"]** **P: 1×[1x170"]** **BM: 1×[2×60"]** **PT: 1×[2×60"]**		Pengenalan model relasional: struktur data basis data dan model relasional **[1] Bab 4** **[2] Bab 3** *Introduction to relational model: data structure, database, and relational model* ***[1] Chapter 4*** ***[2] Chapter 3***	10%
3-4	Mampu memahami konsep relasional entitas	3.1 Dapat memahami dan menjelaskan model dan diagram relasional	Tes – non tes (observasi aktivitas di kelas)	Kuliah dan Praktikum Case Methods		1. Konsep ER (Entity Relationship): ERM (Entity Relationship	15%

	Able to understand relational entity concept	entitas dalam basis data 3.2 Dapat menerapkan model relasional entitas pada permasalahan riil *3.1 Able to understand and explain model and entity relational diagram in database* *3.2 Able to apply relational entity model in real problem*	*Test – non-test (observation and activity in class)*	*Lectures and Practices Case Methods* **TM: 2×[2x50"]** **P: 2×[1x170"]** **BM: 2×[2×60"]** **PT: 2×[2×60"]**		Model) dan ERD (Entity Relationship Diagram) 2. Penerapan model ER pada permasalahan riil **[1] Bab 12** **[2] Bab 4** *1. ER (Entity Relationship) concept: ERM (Entity Relationship Model) and ERD (Entity Relationship Diagram)* *2. Application of ER model in real problem* ***[1] Chapter 12*** ***[2] Chapter 4***	
5-7	Mampu memahami dan menjalankan perintah dan bahasa pemrograman SQL *Able to understand and running command and SQL programming language*	1. Dapat memahami dan menjelaskan tipe data dan struktur bahasa pemrograman SQL 2. Dapat menyusun dan menjalankan operasi dalam SQL menggunakan perintah sederhana maupun menggunakan bahasa pemrograman SQL *4.1 Able to understand and explain data types and the structure of the SQL programming language* *4.2 Able to compile and carry out operations in SQL using simple commands or using the SQL programming language*	Tes – non tes (observasi aktivitas di kelas) *Test – non-test (observation and activity in class)*	Kuliah dan Praktikum Case Methods *Lectures and Practices Case Methods* **TM: 3×[2x50"]** **P: 3×[1x170"]** **BM: 3×[2×60"]** **PT: 3×[2×60"]**		1. Tipe data dalam basis data; Struktur bahasa pemrograman SQL 2. Dasar penulisan perintah SQL; Dasar bahasa pemrograman SQL **[2] Bab 7** **[3] Bab 2** *1. Data type in database; SQL programming language structure* *2. Basic for writing SQL commands; Basic SQL programming language* ***[2] Chapter 7*** ***[3] Chapter 2***	20%
8	**ETS/*Midterm***						

9-10	Mampu memahami dan menjalankan perintah DML (*Data Manipulation Language*) *Able to understand and running DML command (Data Manipulation Language)*	6.1 Dapat memahami dan menjalankan perintah untuk operasi perubahan data 6.2 Dapat menjalankan perintah untuk operasi mengurutkan, membuat grup, dan menghitung agregat data *6.1 Can understand and execute commands for data change operations,* *6.2 Can execute commands for sorting, grouping, and calculating data aggregate operations*	Tes – non tes (observasi aktivitas di kelas) *Test – non-test (observation and activity in class)*	Kuliah dan Praktikum Case Methods *Lectures and Practices* *Case Methods* **TM: 2×[2x50"]** **P: 2×[1x170"]** **BM: 2×[2×60"]** **PT: 2×[2×60"]**		1. Menambah, menghapus, dan menyisipkan data; menyimpan perubahan data; memperbarui data 2. Mengurutkan data, membuat grup, dan menghitung agregat data **[1] Bab 6** **[3] Bab 5** *1. Add, delete, and insert data; save data changes; updating data* *2. Sort data, create groups, and calculate aggregated data* ***[1] Chapter 6*** ***[3] Chapter 5***	10%
11-12	Mampu memahami dan menjalankan perintah DDL (*Data Definition Language*) *Able to understand and running DML command (Data Manipulation Language)*	5.1 Dapat memahami dan menjalankan konstrain pemodelan data 5.2 Dapat memahami dan menjalankan operasi tabel basis data 5.3 Dapat menjalankan perintah untuk menampilkan relasional data *5.1 Can understand and run data modeling constraints* *5.2 Can understand and run database table operations*	Tes – non tes (observasi aktivitas di kelas) *Test – non-test (observation and activity in class)*	Kuliah dan Praktikum Case Methods *Lectures and Practices* *Case Methods* **TM: 2×[2x50"]** **P: 2×[1x170"]** **BM: 2×[2×60"]** **PT: 2×[2×60"]**		1. Konstrain pemodelan data 2. Membuat basis data dan tabel, mengubah definisi tabel, menghapus tabel 3. Menampikan relasional data dengan perintah VIEW **[1] Bab 7** **[3] Bab 3** *1. Data modeling constraints* *2. Creating databases and*	10%

		5.3 *Can run commands to display relational data*				*tables, changing table definitions, deleting tables* 3. *Display relational data with the VIEW command* ***[1] Chapter 7*** ***[3] Chapter 3***	
13	Mampu melakukan normalisasi tabel *Able to normalize the table*	7.1 Dapat memahami dan melakukan normalisasi data 7.2 Dapat memahami dan menyusun algoritma dengan fungsi SEQUENCE dan INDEX *7.1 Able to do data normalization* 7.2 *Able to understand and arrange algorithm and the function SEQUENCE and INDEX*	Tes – non tes (observasi aktivitas di kelas) *Test – non-test (observation and activity in class)*	Kuliah dan Praktikum Case Methods *Lectures and Practices* *Case Methods* **TM: 1×[2x50”]** **P: 1×[1x170”]** **BM: 1×[2×60”]** **PT: 1×[2×60”]**		1. Normalisasi: pengertian dan tujuan normalisasi, tahapan normalisasi, data berulang, anomali, dependensi fungsional 2. Obyek basis data: fungsi SEQUENCE dan INDEX **[1] Bab 14** **[2] Bab 6** 1. *Normalization: definition and purpose of normalization, normalization stages, repetitive data, anomalies, functional dependencies* 2. *Database objects: SEQUENCE and INDEX functions* ***[1] Chapter 14*** ***[2] Chapter 6***	10%
14	Mampu melakukan manajemen multi-tabel *Able to do multi-label*	8.1 Dapat memahami dan menjelaskan konsep penggabungan multi-label	Observasi Aktifitas di kelas Tugas Besar (Tugas 2)	Kuliah dan Praktikum Case Methods *Lectures and Practices*		1. Penggabungan data dari multi-tabel: cartesian joins, equality joins, Non-	10%

	management	8.2 Dapat memahami dan menyusun algoritma untuk mendapatkan gabungan dan irisan data *8.1 Can understand and explain the concept of merging multi-labels* 8.2 *Can understand and develop algorithms to get combined and sliced data*	*Observation and In Class Activity Final Project (Assignment 2)*	*Case Methods* **TM: 1×[2x50"]** **P: 1×[1x170"]** **BM: 1×[2×60"]** **PT: 1×[2×60"]**		equality joins, self-joins, outer joins 2. Operator gabungan dan irisan **[2] Bab 8** **[3] Bab 9** *1. Merging data from multi-tables: cartesian joins, equality joins, non-equality joins, self-joins, outer joins* *2. Merge and slice operators* ***[2] Chapter 8*** ***[3] Chapter 9***	
15	Mampu menggunakan sistem basis data untuk menyelesaikan permasalahan statistika *Able to use database system to solve statistical problems*	9.1 Dapat menggunakan sistem basis data untuk menyelesaikan permasalahan statistika *9.1 Able to use database system to solve statistical problems*	Observasi Aktifitas di kelas Tugas Besar (Tugas 2) *Observation and In Class Activity Final Project (Assignment 2)*	Kuliah dan Praktikum Case Methods *Lectures and Practices Case Methods* **TM: 1×[2x50"]** **P: 1×[1x170"]** **BM: 1×[2×60"]** **PT: 1×[2×60"]**		Project sistem basis data untuk pemodelan statistika di berbagai bidang *Database system project for statistical modelling in many fields*	10%
16	**Evaluasi Akhir Semester / Ujian Akhir Semester/*Final Exam***						