MODULE HANDBOOK

ACTUARY

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

ENDORSEMENT PAGE

	MODULE HANDBOOK **ACTUARY** **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*	Dr. Ir. Setiawan, M.S.	Dosen Lecturer		
Pemeriksa dan Pengendalian *Review and Control*	Dr. Ir. Setiawan, M.S. Dr. Drs. Agus Suharsono, M.S. Dr. Muhammad Sjahid Akbar, S.Si, M.Si	Tim kurikulum Curriculum team		
Persetujuan *Approval*	Dr. Ir. Setiawan, M.S	Koordinator RMK Course Cluster Coordinator		
Penetapan *Determination*	Dr. Kartika Fithriasari, M.Si	Kepala Departemen Head of Department		

MODULE HANDBOOK
ACTUARY

Module name	ACTUARY	
Module level	Undergraduate	
Code	SS234635	
Course (if applicable)	ACTUARY	
Semester	6	
Person responsible for the module	Dr. Ir. Setiawan, M.S.	
Lecturer	Dr. Ir. Setiawan, M.S. Dr. Drs. Agus Suharsono, M.S. Dr. Muhammad Sjahid Akbar, S.Si, M.Si	
Language	Bahasa Indonesia and English	
Relation to curriculum	Undergradute degree program, elective, 6th semester.	
Type of teaching, contact hours	Non SCL (100%)	
Workload	1. Lectures [L] : 3 x 50 = 150 minutes per week. 2. Exercises and Assignments [EA] : 3 x 60 = 180 minutes (3 hours) per week. 3. Independent learning [IL]: 3 x 60 = 180 minutes (3 hours)perweek.	
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	Regression Analysis	
Learning outcomes and their corresponding PLOs	CLO.1 Able to understand and apply financial mathematical concepts and opportunities to analyze problems in life insurance CLO.3 Able to analyze data by applying mathematics and statistics in insurance CLO.4 Able to identify, formulate, and solve statistical problems in the insurance industry CLO.6 Have knowledge of current and upcoming issues related to insurance midwives CLO.7 Able to communicate effectively and work together in interdisciplinary and multidisciplinary teams CLO.8 Have professional responsibilities and ethics CLO.9 Able to motivate yourself to think creatively and learn throughout life	PLO-1 PLO-3 PLO-4 PLO-9

Content	Actuarial is one of the courses in the field of Economics, Finance and Actuarial which has one of the fields of study determining premiums, policies, and insurance reserves. The purpose of studying Actuarial is to understand and apply the mathematical concepts of finance and the opportunity to analyze problems in life insurance. The topics that will be studied include survival function, living and selective tables, insurance benefits, living annuities, premium value calculations, policy value calculations, and reserves.
Assessment and its weight	Assigment – 20% Quiz I – 10% Midterm Exam – 20% Quiz II – 25% Final Exam– 25%
Media employed	LCD, whiteboard, websites (myITS Classroom), zoom
Reading list	1. Gupta, A.K., Varga, T., (2002), An Introduction to Actuarial Mathematics, Springer, USA Lyun, Yuh-Dueh. (2002). *Financial Engineering and Computation, Principles, Mathematics, Algorithms*. Cambridge. 2. Cunningham, R., Herzog, T. and R. London,(2006), Models for Quantifying Risk, 3rd edition

	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*
AKTUARIA/*ACTUARY*	SS234635	ANDEF	T= 3	P= 0	VI	11 Januari 2023

OTORISASI/ *AUTHORIZATION*	Pengembang RPS/ *RPS Developer*	Koordinator RMK/ *Course Group Coordinator*	Ketua PRODI/ *Head of Department*
	Dr. Ir. Setiawan, M.S.	Dr. Ir. Setiawan, M.S.	Dr. Kartika Fithriasari, M.Si

Capaian Pembelajaran (CP)/ ***Learning Achievement***

CPL-PRODI yang dibebankan pada MK/ ***PLO***

CPL-1	Mampu menerapkan sains dan Matematika untuk mendukung pemahaman metode statistika
CPL-3	Mampu menerapkan teori statistika pada metode statistika
CPL-4	Mampu menggunakan perangkat komputasi modern untuk menyelesaikan permasalahan statistik
CPL-9	Mampu menerapkan metode statistika untuk menganalisis permasalahan teoritis dan rill
PLO-1	*Able to apply science and mathematics to support the understanding of statistical methods*
PLO-3	*Able to apply statistical theory to statistical methods*
PLO-4	*Able to use modern computing devices to solve statistical problems*
PLO-9	*Able to apply statistical methods to analyze theoretical and real problems*

Capaian Pembelajaran Mata Kuliah (CPMK)/ ***CLO***

CPMK.1	Mampu memahami dan menerapkan konsep-konsep matematika keuangan dan peluang untuk menganalisa masalah dalam asuransi jiwa
CPMK.3	Mampu menganalisis data dengan mengaplikasikan matematika dan statistika dalam asuransi
CPMK.4	Mampu mengindentifikasi,memformulasi, dan menyelesaikan masalah statistika di industri asuransi

CPMK.6 Memiliki pengetahuan tentang isu terkini dan mendatang yang berkaitan dengan bidan asuransi
CPMK.7 Mampu berkomunikasi secara efektif dan bekerjasama dalam tim yang interdisiplin dan multidisiplin
CPMK.8 Memiliki tanggung jawab dan etika profesi
CPMK.9 Mampu memotivasi diri untuk berpikir kreatif dan belajar sepanjang hayat
CLO.1 Able to understand and apply financial mathematical concepts and opportunities to analyze problems in life insurance
CLO.3 Able to analyze data by applying mathematics and statistics in insurance
CLO.4 Able to identify, formulate, and solve statistical problems in the insurance industry
CLO.6 Have knowledge of current and upcoming issues related to insurance midwives
CLO.7 Able to communicate effectively and work together in interdisciplinary and multidisciplinary teams
CLO.8 Have professional responsibilities and ethics
CLO.9 Able to motivate yourself to think creatively and learn throughout life

Matrik CPL – CPMK
PLO-CLO Matrix

CPMK	CPL-4	CPL-5	CPL-7	CPL-9
CPMK-1	V	V		
CPMK-2	V	V		V
CPMK-3		V	V	V
CPMK-4			V	V
CPMK-5	V	V		V
CPMK-6		V	V	V

Deskripsi Singkat MK/ *Course Description*

Aktuaria merupakan salah satu mata kuliah di bidang Ekonomi, Finansial dan Aktuaria yang mempunyai salah satu bidang kajian menentukan premi, polis dan cadangan asuransi. Tujuan mempelajari Aktuaria adalah untuk memahami dan menerapkan konsep-konsep matematika keuangan dan peluang untuk menganalisa masalah dalam asuransi jiwa. Topik-topik yang yang akan dipelajari diantaranya : fungsi survival, tabel hidup dan selektif, insurance benefit, anuitas hidup, perhitungan nilai premi, perhitungan nilai polis, dan cadangan.

Actuarial is one of the courses in the field of Economics, Finance and Actuarial which has one of the fields of study determining premiums,
policies, and insurance reserves. The purpose of studying Actuarial is to understand and apply the mathematical concepts of finance and the
opportunity to analyze problems in life insurance. The topics that will be studied include survival function, living and selective tables, insurance
benefits, living annuities, premium value calculations, policy value calculations, and reserves.

Bahan Kajian: Materi Pembelajaran/ ***Course Material***	Dasar Sains, Teori Statistika, Pemodelan, Industri dan Bisnis, Ekonomi dan Manajemen *Basic Science, Statistical Theory, Modeling, Industry and Business, Economics and Management*
Pustaka/ ***References***	**Utama/*Primary*:** 1. Gupta, A.K., Varga, T., (2002), An Introduction to Actuarial Mathematics, Springer, USA Lyun, Yuh-Dueh. (2002). *Financial Engineering and Computation, Principles, Mathematics, Algorithms*. Cambridge. **Pendukung/*Secondary :*** 2. Cunningham, R., Herzog, T. and R. London,(2006), Models for Quantifying Risk, 3rd edition
Dosen Pengampu/ ***Lecturers***	Dr. Ir. Setiawan, M.S. Dr. Drs. Agus Suharsono, M.S. Dr. Muhammad Sjahid Akbar, 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)**
1,2	1. Memahami apa yang	1. Dapat memahami	Tes	Ceramah Interaktif,		Pengertian aktuaria dan	10%

	akan dipelajari dalam keseluruhan kuliah 2. Memahami Konsep dasar dalam ilmu aktuaria 3. Memahami konsep - konsep dasar dalam matematika keuangan 4. Memahami konsep mortalitas yang digunakan dalam aktuaria 5. Memahami konsep dalam asuransi jiwa dan jenisnya 6. Memahami konsep perhitungan premi 7. Memahami konsep cadangan premi *1. Understand what will be learned in the whole lecture* *2. Understand the basic concepts in actuarial science* *3. Understand basic concepts in financial mathematics* *4. Understand the concept of mortality used in the actuarial* *5. Understand the concept of life insurance and its types* *6. Understand the concept of premium calculation* *7. Understand the*	pengertian aktuaria dan asuransi 2. Dapat memahami konsep-konsep dasar dalam aktuaria 3. Dapat memahami konsep-konsep-konsep dasar dalam matematika keuangan *1. Can understand the meaning of actuarial and insurance* *2. Can understand basic concepts in actuarial* *3. Can understand basic concepts in financial mathematics*	Observasi Aktifitas di kelas *Test* *Observation of activities in class*	Diskusi, Latihan Soal *Interactive Lectures, Discussions, Exercise* **TM: 2x3x50"** **PT: 2x3x60"** **BM: 2x3x60"**		asuransi Review matematika keuangan: • bunga majemuk, • nilai tunai (present Value), anuitas *Definition of actuarial and insurance* *Financial math review:* *• compound interest,* *• cash value (present value), annuity*	
3-5		Dapat memahami konsep mortalitas yang digunakan dalam aktuaria *Can understand the concept of mortality used in the actuarial*	Tes Tugas 1 (Observasi Aktifitas di kelas) *Test* *Task 1 (Observation of activities in class)*	Ceramah Interaktif, Diskusi, Latihan Soal *Interactive Lectures, Discussions, Exercise* **TM: 3x3x50"** **PT: 3x3x60"** **BM: 3x3x60"**		• Survival models • fungsi-fungsi aktuaria dari mortalitas • Tabel mortalitas • *Survival models* • *Actuarial functions of mortality* • *Mortality table*	20%
6.7		Dapat memahami konsep dalam asuransi jiwa dan jenisnya *Can understand the concept of life insurance and its types*	Tes & Observasi Aktifitas di kelas (TOA) *Test* *Observation of activities in class*	Presentasi Game Latihan soal & Diskusi *Presentation* *Games* *Practice questions & Discussion* **TM: 2x3x50"** **PT: 2x3x60"**		• Asuransi Jiwa dan Anuitas: Stochastic Cash Flow, • *Pure Endowments,* • *life insurances,* • *Endowments,* • *life annuities* • *Life Insurance and Annuities: Stochastic Cash Flow,* • *Pure Endowments,*	20%

	concept of premium reserves			**BM: 2x3x60”**		• *Life insurance,* • *Endowments,* • *Life annuities*	
9-11		Dapat menentukan perhitungan premi dalam asuransi *Can determine the calculation of premiums in insurance*	Tes & Observasi Aktifitas di kelas (TOA) *Test* *Observation of activities in class*	Presentasi Game Latihan soal & Diskusi *Presentation* *Games* *Practice questions & Discussion* **TM: 3x3x50”** **PT: 3x3x60”** **BM: 3x3x60”**		Premi: • Premi Bersih (*Net Premiums*); • Premi Kotor (*Gross Premiums*) *Premium:* • *Net Premiums (Net Premiums);* • *Gross Premiums (Gross Premiums)*	25%
12-15		Dapat menentukancadangan premi perusahaan asuransi. *Can determine insurance company premium reserves.*	TOA *Test* *Observation of activities in class*	Presentasi Latihan soal & Diskusi *Presentation* *Practice questions & Discussion* **TM: 4x3x50”** **PT: 4x3x60”** **BM: 4x3x60”**		Reserves (Cadangan): • Cadangan Premi Bersih (Net Premium Reserves), • Mortality Profit, Modified Reserves (Cadangan dimodifikasi) *Reserves:* • *Net Premium Reserves,* • *Mortality Profit, Modified Reserves*	25%
16	**Evaluasi Akhir Semester / Ujian Akhir Semester /** *final exam*						