MODULE HANDBOOK

ACTUARIAL

BACHELOR DEGREE PROGRAM

DEPARTMENT OF STATISTICS

FACULTY OF SCIENCE AND DATA ANALYTICS

INSTITUT TEKNOLOGI SEPULUH NOPEMBER

ENDORSEMENT PAGE

	MODULE HANDBOOK **ACTUARIAL** **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*		**March 28, 2019**
Pemeriksa dan Pengendalian *Review and Control*	Wawan Hafid Syaifuddin, M.Si, Act. Sc	Tim kurikulum *Curriculum team*		**April 15, 2019**
Persetujuan *Approval*	Dr. Ir. Setiawan, M.S.	Koordinator RMK *Course Cluster Coordinator*		**July 17, 2019**
Penetapan *Determination*	Dr. Kartika Fithriasari, M.Si	Kepala Departemen *Head of Department*		**July 30, 2019**

MODULE HANDBOOK
ACTUARIAL

Module name	**Actuarial**
Module level	Undergraduate
Code	KS184537
Course (if applicable)	Actuarial
Semester	Seventh Semester (Ganjil)
Person responsible for the module	Dr. Ir. Setiawan, M.S
Lecturer	Wawan Hafid Syaifuddin, M.Si, Act. Sc
Language	Bahasa Indonesia
Relation to curriculum	Undergraduate degree program, **elective**, 7th semester.
Type of teaching, contact hours	Lectures, <50 students
Workload	1. Lectures : 3 x 50 = 150 minutes per week. 2. Exercises and Assignments : 3 x 60 = 180 minutes (3hours) per week. 3. Private learning : 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points (sks)
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Mandatory prerequisites	• Financial Mathematics • Mathematical Statistics I

Learning outcomes and their corresponding to PLOs	CLO.1 Able to understand and apply mathematical financial concepts and opportunities to analyze problems in life insurance	PLO.1
	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 future issues related to insurance sector	PLO.3
	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.4
Content	Actuarial is one of the courses in the field of Economics, Finance and Actuarial which has one of the areas of study determining premiums, policies and insurance reserves. The purpose of studying Actuarial is to understand and apply financial mathematical concepts and opportunities to analyze problems in life insurance. Topics that will be studied include: survival functions, life and selective tables, insurance benefits, life annuities, calculation of premium values, calculation of policy values, and reserves.	
Study and examination requirements and forms of examination	● In-class exercises ● Mid-term examination ● Final examination	
Media employed	LCD, whiteboard, websites (myITS Classroom), zoom.	

Reading list	1. Bower, N.L., Gerber,H.U., Hickman,J.C., Jones,D.A., and Nesbitt, C.J., 1997. *Actuarial Mathematics*. The Society of Actuaries. 2. Cunningham, R., Herzog, T. and London, R., 2006. *Models for Quantifying Risk*. 3. Dickson, D. C.M., Hardy, M. R., and Waters, H.R., 2013. *Actuarial Mathematics for Life Contingent Risk*. 3rd edition. Cambridengane University Press. 4. Gupta, A.K., and Varga, T., 2002. *An Introduction to Actuarial Mathematics*. USA : Springer. 5. Li J., and Ng, A., 2013. *MLC Study manual*. Actex Publication, Inc.

RENCANA PEMBELAJARAN SEMESTER (RPS)
SEMESTER LEARNING PLAN

	Program Studi	Sarjana, Departemen Statistika, FSAD-ITS
	Mata Kuliah	Aktuaria
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	Semester/SKS	VII/3
	MK Prasyarat	-
RP-S1	Dosen Pengampu	Wawan Hafid Syaifuddin, M.Si, Act. Sc

Bahan Kajian *Study Materials*	Dasar Sains, Teori Statistika, Pemodelan, Industri dan Bisnis, Ekonomi dan Manajemen *Basic Science, Statistics Theory, Modeling, Industrial and Business, Economics and Management*
CPL yang dibebankan MK *PLO*	CPL-1 Mampu menerapkan pengetahuan teori statistika, matematika, dan komputasi CPL-3 Mampu menganalisis data dengan metode statistika yang tepat dan mengintepretasikannya CPL-4 Mampu mengindentifikasi,memformulasi, dan menyelesaikan masalah statistika di berbagai bidang terapan *PLO.1 Able to apply knowledge of statistical theory, mathematics, and computation* *PLO.3 Able to analyze data with appropriate statistical methods and interpret them* *PLO.4 Able to identify, formulate, and solve statistical problems in various applied fields*

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CP-MK *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 mathematical financial 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 future issues related to insurance sector* *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*

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Pertemuan *Meeting*	**Kemampuan Akhir Sub CP-MK** *Final Ability*	**Keluasan (materi pembelajaran)** *Extent (learning material)*	**Metode Pembelajaran** *Learning methods*	**Estimasi Waktu** *Duration*	**Bentuk Evaluasi** *Evaluation Type*	**Kriteria dan Indikator Penilaian** *Assessment Criteria and Indicators*	**Bobot Penilaian** *Scoring*

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1,2	1. Memahami apa yang akan dipelajaridalam 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 studied in the entire lecture*	Pengertian aktuaria dan asuransi Review matematika keuangan: ● bunga majemuk, ● nilai tunai (present Value), ● anuitas *Definition of actuarial and insurance* *Financial mathematics review:* *• compound interest,* *• cash value (present value),* *• annuity*	Ceramah interaktif Diskusi (CID) *Interactive Lecture Discussion (CID)*	300 menit *300 minutes*	Tes Observasi Aktifitas di kelas	1. Dapat memahami 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 the basic concepts in actuarial* *3. Can understand basic concepts in financial mathematics*	10%/10%

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3,5	*Understand the basic concepts in actuarial science* *Understand the basic concepts in financial mathematics* *Understand the concept of mortality used in actuarial* *Understand the concepts in life insurance and its types* *Understand the concept of premium calculation* *Understand the concept of premium reserve*	● Survival models ● fungsi-fungsi aktuaria dari mortalitas ● Tabel mortalitas *• Survival models actuarial* *• functions of mortality* *• Mortality table*	CID Active Learning (AL) *CID Active Learning (AL)*	300 menit *300 minutes*	Tes Tugas 1 (Observasi Aktifitas di kelas *Test Assignment 1 (Activity Observation Test in class)*	Dapat memahami konsep mortalitas yang digunakan dalam aktuaria *Can understand the concept of mortality used in actuarial*	20%/30%

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6,7		● Asuransi Jiwa dan Anuitas: Stochastic Cash Flow, ● *Pure Endowments,* ● *life insurances,* ● *Endowments,* ● *life annuities* • *Life Insurance and Annuities: Stochastic Cash Flow,* • *Pure Endowments,* • *life insurances,* • *Endowments,* • *life annuities*	CIDLS *CIDLS*	300 menit *300 minutes*	Tes & Observasi Aktifitas di kelas (TOA) *Test & (Activity Observation Test in class)*	Dapat memahami konsep dalam asuransi jiwa dan jenisnya *Can understand the concepts in life insurance and its types*	20%/50%
8		**ETS**					

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9,11		Premi: ● Premi Bersih (*Net Premiums*); ● Premi Kotor (*Gross Premiums*) *Premium:* *• Net Premiums (Net Premiums);* *• Gross Premiums*	CIDLS *CIDLS*	300 menit *300 minutes*	Tes & Observasi Aktifitas di kelas (TOA) *Test & (Activity Observation Test in class)*	Dapat menentukan perhitungan premi dalam asuransi *Can determine the calculation of premiums in insurance*	25%/75%
12,15		Reserves (Cadangan): ● Cadangan Premi Bersih (Net Premium Reserves), ● Mortality Profit, ● Modified Reserves (Cadangan dimodifikasi) *Reserves:* *• Net Premium Reserves,* *• Mortality Profit,* *• Modified Reserves*	CIDLS *CIDLS*	300 menit *300 minutes*	TOA *TOA*	Dapat menentukancadangan premi perusahaan asuransi. *Can determine insurance company premium reserves.*	25%/100%
16	**EAS**						

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PUSTAKA/ REFERENCES :

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.