

MODULE HANDBOOK
**CATEGORICAL
DATA ANALYSIS**



**BACHELOR DEGREE PROGRAM
DEPARTEMENT OF STATISTICS
FACULTY OF SCIENCE AND DATA ANALYTICS
INSTITUT TEKNOLOGI SEPULUH NOPEMBER**


ENDORSEMENT




**MODULE HANDBOOK
QUALITATIVE DATA ANALYSIS
DEPARTMENT OF STATISTICS
INSTITUT TEKNOLOGI SEPULUH NOPEMBER**

Proses Process	Penanggung Jawab Person in Charge			Tanggal Date
	Nama Name	Jabatan Position	Tandatangan Signature	
<i>Perumus Preparation</i>	Dr. Drs. Puhadi, M.Sc	Dosen <i>Lecturer</i>		March 28, 2019
<i>Pemeriksa dan Pengendalian Review and Control</i>	Dr. Drs. Puhadi, M.Sc ; Dr. Vita Ratnasari, S.Si, M.Si ; Santi Puteri Rahayu, M.Si., Ph.D	Tim kurikulum <i>Curriculum team</i>		April 15, 2019
<i>Persetujuan Approval</i>	Dr. Santi Wulan Purnami, S.Si, M.Si	Koordinator RMK <i>Course Cluster Coordinator</i>		July 17, 2019
<i>Penetapan Determination</i>	Dr. Kartika Fithriasari, M.Si	Kepala Departemen <i>Head of Department</i>		July 30, 2019

	<p><i>CLO-7 Able to communicate effectively and work together in interdisciplinary and multidisciplinary teams</i></p> <p><i>CLO-8 Have professional responsibilities and ethics</i></p> <p><i>CLO-9 Able to motivate oneself to think creatively and learn lifelong</i></p>	PLO-3
Content	<p><i>Category data analysis is a statistical modeling course. There are five topics that will be studied in this course, starting from a). Two, three and k dimensional contingency tables. b). Calculates multiple association measures. d). Create two, three and k dimensional linear log models. e). Creating binary, multinomial and ordinal logistic regression models. f). Create a probit regression model. g). Poisson regression model. Through this course, it is hoped that students will have the ability to think critically and be able to make the right decisions to solve problems using Category Data. The learning strategies used are lectures, discussions, exercises, and assignments.</i></p>	
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	<ol style="list-style-type: none"> 1. Agresti, Alan. An Introduction to Categorical Data Analysis. Hoboken, New Jersey: John Wiley & Sons, Inc, 2007. 2. Agresti Alan. Categorical Data Analysis. Hoboken, New Jersey: A John Wiley & Sons, Inc, 2002. 3. David W. Hosmer, Stanley Lemeshow. Applied Logistic Regression. New York: John Wiley & Sons, Inc, 2000 	

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Bahan Kajian <i>Study Materials</i>	<p>Dasar Sains, Teori Statistika, Komputasi dan Data Processing, Pemodelan, Industri dan Bisnis, Pemerintahan dan Kependudukan, Ekonomi dan Manajemen, Kesehatan dan Lingkungan, dan Sosial Humaniora</p> <p><i>Basic Science, Statistical Theory, Computing and Data Processing, Modeling, Industry and Business, Government and Population, Economics and Management, Health and Environment, and Social Humanities</i></p>
CPL yang dibebankan MK <i>Program Learning Outcome</i>	<p>CPL-1 Mampu menerapkan pengetahuan teori statistika, matematika, dan komputasi</p> <p>CPL-3 Mampu menganalisis data dengan metode statistika yang tepat dan menginterpretasikannya</p> <p>CPL-4 Mampu mengidentifikasi, memformulasi, dan menyelesaikan masalah statistika di berbagai bidang terapan</p> <p><i>PLO-1 Able to apply knowledge of statistical theory, mathematics, and computation</i></p> <p><i>PLO-3 Able to analyze data with appropriate statistical methods and interpret them</i></p> <p><i>PLO-4 Able to identify, formulate, and solve statistical problems in various applied fields</i></p>
CP-MK	<p>CPMK.1 Menguasai konsep teoritis metode untuk data kategorikal</p> <p>CPMK.2 Mampu memformulasikan penyelesaian dan menganalisis masalah prosedural untuk data kategorikal menggunakan metode statistika yang tepat dan menginterpretasikannya</p> <p>CPMK.3 Mampu mengaplikasikan metode untuk data kategorikal</p> <p>CPMK.4 Mampu mengidentifikasi, memformulasi, dan menyelesaikan masalah statistika di berbagai bidang terapan menggunakan statistical software</p> <p>CPMK.5 Mampu beradaptasi terhadap situasi yang dihadapi</p> <p>CPMK.6 Mampu mengambil keputusan yang tepat berdasarkan analisis data kategorikal dan mampu mengkomunikasikan hasil analisis baik secara lisan maupun tertulis</p> <p>CPMK.7 Mampu berkomunikasi secara efektif dan bekerjasama dalam tim yang interdisiplin dan multidisiplin</p> <p>CPMK.8 Memiliki tanggung jawab dan etika profesi</p> <p>CPMK.9 Mampu memotivasi diri untuk berpikir kreatif dan belajar sepanjang hayat</p> <p><i>CLO-1 Mastering the theoretical concepts of methods for categorical data</i></p> <p><i>CLO-2 Able to formulate solutions and analyze procedural problems for categorical data using appropriate statistical methods and interpret them</i></p> <p><i>CLO-3 Able to apply methods to categorical data</i></p> <p><i>CLO-4 Able to identify, formulate, and solve statistical problems in various applied fields using statistical software</i></p>

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<p><i>CLO-5 Able to adapt to the situation at hand</i></p> <p><i>CLO-6 Able to take correct decisions based on categorical data analysis and be able to communicate the results of analysis both orally and in writing</i></p> <p><i>CLO-7 Able to communicate effectively and work together in interdisciplinary and multidisciplinary teams</i></p> <p><i>CLO-8 Have professional responsibilities and ethics</i></p> <p><i>CLO-9 Able to motivate oneself to think creatively and learn lifelong</i></p>

Pertemuan <i>Meeting</i>	Kemampuan Akhir Sub CP-MK <i>Final Ability</i>	Keluasan (materi pembelajaran) <i>Extent (learning material)</i>	Metode Pembelajaran <i>Learning Methods</i>	Estimasi Waktu <i>Duration</i>	Bentuk Evaluasi <i>Evaluation Type</i>	Kriteria dan Indikator Penilaian <i>Assessment Criteria and Indicators</i>	Bobot Penilaian Scoring
1	1. Dapat menjelaskan konsep analisis data kategorikal <i>1.Can explain categorical data analysis</i>	Pengantar Analisis Data Kategorikal <i>Introduction to Categorical Data Analysis</i>	Ceramah interaktif Diskusi (CID) <i>Interactive Lecture Discussion</i>	150 menit <i>150 Minutes</i>	Observasi Aktifitas di kelas <i>Observation of classroom activities</i>	1.1 Dapat menjelaskan dan memberikan contoh data kategorikal 1.2 Dapat menjelaskan skala pengukuran data 1.3 Dapat memberikan aplikasi penggunaan data kategorikal <i>1.1 Can explain and provide examples of categorical data</i> <i>1.2 Can explain the scale of data measurement</i> <i>1.3 Can provide categorical data usage applications</i>	5%/ 5%




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2	2. Dapat menjelaskan Distribusi probabilitas dan inferens data kategorikal <i>2.Can explain probability distribution and inferencing categorical data</i>		Ceramah interaktif Diskusi (CID) <i>Interactive Lecture Discussion</i>	150 menit <i>150 Minutes</i>	Observasi Aktifitas di kelas <i>Observation of classroom activities</i>	2.1 Dapat menjelaskan distribusi probabilitas untuk data kategorikal 2.2 Dapat menganalisis secara statistikal inferens distribusi probabilitas untuk data kategorikal <i>2.1 Can explain probability distributions for categorical data 2.2 Can analyze statistically inferential probability distributions for categorical data</i>	5%/ 10%
3	3. Dapat menganalisis Tabel Kontingensi dua dimensi : Odd ratio, Relative Risk, dan Uji independensi <i>3.Can analyze two-dimensional Contingency Tables: Odd ratio, Relative Risk, and Independence Test</i>	Tabel Kontigensi <i>Contingency Table</i>	Ceramah interaktif Diskusi (CID) <i>Interactive Lecture Discussion</i>	150 menit <i>150 Minutes</i>	Ceramah Observasi Aktifitas di kelas <i>Observation of classroom activities</i>	3.1 Mampu menjelaskan dan membuat tabel kontingensi dua dimensi 3.2 Mampu menganalisis dengan menggunakan odds ratio, relative risk 3.3 Mampu menguji independensi dengan menggunakan metode Chi square, I ikelihood ratio, Fisher, Mc Nemar <i>3.1 Able to explain and create two-dimensional contingency tables</i>	10%/ 20%



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						3.2 Able to analyze using odds ratios, relative risk 3.3 Able to test independence using the Chi square method, likelihood ratio, Fisher, Mc Nemar	
4,5	4. Dapat menganalisis Tabel Kontingensi tiga dimensi dan k dimensi (Odd ratio, Relative Risk, Uji independensi) <i>4. Can analyze three-dimensional and k-dimensional Contingency Tables (Odd ratio, Relative Risk, Independence Test)</i>		Ceramah interaktif Diskusi (CID) <i>Interactive Lecture Discussion</i>	300 menit <i>300 Minutes</i>	Tugas 1 Ceramah Observasi Aktifitas di kelas Tes 1 <i>Task 1 Lecture Observation of classroom activities Test 1</i>	4.1 Mampu menjelaskan dan membuat tabel kontingensi tiga dimensi dan k dimensi 4.2 Mampu menganalisis dengan menggunakan odds ratio, relative risk 4.3 Mampu menguji independensi dengan menggunakan metode Chi square (mutually independen, conditionally independen, jointly independen) <i>4.1 Able to explain and create three-dimensional and k-dimensional contingency tables 4.2 Able to analyze using odds ratios, relative risk 4.3 Able to test independence using the Chi square method (mutually independent,</i>	10%/ 30%

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						<i>conditionally independent, jointly independent)</i>	
6	5. Mampu membuat Model Log Linear dua dimensi serta menginterpretasikan <i>5.Able to make a two-dimensional Linear Log Model and interpret it</i>	Model log linear <i>Linear log model</i>	Ceramah interaktif Diskusi (CID) <i>Interactive Lecture Discussion</i>	150 menit <i>150 Minutes</i>	Tugas 2 Ceramah Observasi Aktifitas di kelas Tes 2 <i>Task 2 Lecture Observation of classroom activities Test 2</i>	5.1 Mampu mengestimasi dan menguji parameter model log linear dua dimensi 5.2 Mampu menganalisa dan menginterpretasikan model log linear dua dimensi (predictor kontinu, predictor diskrit) <i>5.1 Able to estimate and test parameters of a two-dimensional linear log model 5.2 Able to analyze and interpret a two-dimensional linear log model (continuous predictor, discrete predictor)</i>	10%/ 40%
7	6. Mampu membuat model Log linear tiga dimensi serta menginterpretasikan		Ceramah interaktif Diskusi (CID) <i>Interactive Lecture Discussion</i>	150 menit <i>150 Minutes</i>	Tugas 3 Ceramah Observasi Aktifitas di kelas <i>Task 3 Lecture</i>	6.1 Mampu mengestimasi dan menguji parameter model log linear tiga dimensi 6.2 Mampu menganalisa dan menginterpretasikan model log linear tiga dimensi	10%/ 50%



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	6. Able to make three dimensional linear Log model and interpret				Observation of classroom activities	(predictor kontinu, predictor diskrit) 6.1 Able to estimate and test three-dimensional linear log model parameters 6.2 Able to analyze and interpret a three-dimensional linear log model (continuous predictor, discrete predictor)	
8	ETS						
9,10	7. Mampu membuat model regresi logistic biner serta menginterpretasikan 7. Able to make binary logistic regression model and interpret	Model regresi logistic <i>Logistic Regression Model</i>	Ceramah interaktif Diskusi (CID) <i>Interactive Lecture Discussion</i>	300 menit <i>300 Minutes</i>	Tugas 4 Ceramah Observasi Aktifitas di kelas Tes 3 <i>Task 4 Lecture Observation of classroom activities Test 3</i>	7.1 Mampu mengestimasi dan menguji parameter model regresi logistic biner 7.2 Mampu menganalisa dan menginterpretasikan model regresi logistic biner 7.1 Able to estimate and test parameters of binary logistic regression model 7.2 Able to analyze and interpret binary logistic regression models	15%/ 65%



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Perte-muan <i>Meeting</i>	Kemampuan Akhir Sub CP-MK <i>Final Ability</i>	Keluasan (materi pembelajaran) <i>Extent (learning material)</i>	Metode Pembelajaran <i>Learning Methods</i>	Estimasi Waktu <i>Duration</i>	Bentuk Evaluasi <i>Evaluation Type</i>	Kriteria dan Indikator Penilaian <i>Assessment Criteria and Indicators</i>	Bobot Penilaian <i>Scoring</i>
11	8. Mampu membuat model regresi logistic multinomial serta menginterpretasikan <i>8.Able to make multinomial logistic regression models and interpret</i>	Model regresi logistic <i>Logistic Regression Model</i>	Ceramah interaktif Diskusi (CID) <i>Interactive Lecture Discussion</i>	150 menit <i>150 Minutes</i>	Tugas 5 Ceramah Observasi Aktifitas di kelas <i>Task 5 Lecture Observation of classroom activities</i>	8.1 Mampu mengestimasi dan menguji parameter model regresi logistic multinomial 8.2 Mampu menganalisa dan menginterpretasikan model regresi logistic multinomial <i>8.1 Able to estimate and test parameters of multinomial logistic regression models 8.2 Able to analyze and interpret multinomial logistic regression models</i>	10%/ 75%
12,13	9. Mampu membuat model regresi logistic ordinal serta menginterpretasikan <i>9.Able to make ordinal logistic regression models and interpret</i>	Model regresi logistic <i>Logistic Regression Model</i>	Ceramah interaktif Diskusi (CID) <i>Interactive Lecture Discussion</i>	300 menit <i>300 Minutes</i>	Tugas 6 Ceramah Observasi Aktifitas di kelas <i>Task 6 Lecture Observation of classroom activities</i>	9.1 Mampu mengestimasi dan menguji parameter model regresi logistic ordinal 9.2 Mampu menganalisa dan menginterpretasikan model regresi logistic ordinal <i>9.1 Able to estimate and test parameters of ordinal logistic regression model 9.2 Able to analyze and interpret ordinal logistic regression models</i>	10%/ 85%

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14	10. Mampu membuat model regresi Probit <i>10. Able to make a Probit regression model</i>	Model Regresi Probit <i>Probit Regression Model</i>	Ceramah interaktif Diskusi (CID) <i>Interactive Lecture Discussion</i>	150 menit <i>150 Minutes</i>	Ceramah Observasi Aktifitas di kelas <i>Lecture Observation of classroom activities</i>	10.1 Mampu menganalisa dan menginterpretasikan model regresi Probit <i>10.1 Able to analyze and interpret the Probit regression model</i>	10%/ 95%
15	11. Mampu membuat model regresi Poisson <i>11. Able to make a Poisson regression model</i>	Model Regresi Poisson <i>Poisson Regression Model</i>	Ceramah interaktif Diskusi (CID) <i>Interactive Lecture Discussion</i>	150 menit <i>150 Minutes</i>	Ceramah Observasi Aktifitas di kelas <i>Lecture Observation of classroom activities</i>	11.1 Mampu menganalisa dan menginterpretasikan model regresi Poisson <i>11.1 Able to analyze and interpret the Probit regression model</i>	5%/ 100%
16	EAS						

PUSTAKA :

References :

1. Agresti, Alan. An Introduction to Categorical Data Analysis. Hoboken, New Jersey: John Wiley & Sons, Inc, 2007.
2. Agresti Alan. Categorical Data Analysis. Hoboken, New Jersey: A John Wiley & Sons, Inc, 2002.
3. David W. Hosmer, Stanley Lemeshow. Applied Logistic Regression. New York: John Wiley & Sons, Inc, 2000

