

Statistics

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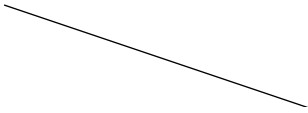
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Introduction to Statistical Learning and Data Science

Statistics Introduction to Statistical Learning and Data Science The Qualitative Methods and
Numerical Simulation for Differential Equations

Introduction to Statistical Learning and Data Science

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				39.0		900		
				10.0		160		
				70.0		1120		
				21.0		336		
				140.0		2420		
				26.0		31		
				4.0		4		
				140.0+30.0=170.0				
				+		=		
	1	2	3	4	5	6	7	8
	23.5	27	26	24.5	20	21	14	14
					5			4

2.

2420 1924 496 2046 374

	031101661			40	36			4	2.5	1
	031101761			48	36			12	3.0	2
	031101371			40	36			4	2.5	4
	031101424			40	36			4	2.5	3
	031101522			40	36			4	2.5	3
	031101331			64	64				2.0	1-8
	044101382	A		48	48				3.0	1
	044102453			48	48				3.0	2
	044103681	B C		48	48				3.0	1
	044103691			48	48				3.0	2
	045101643			32	0			32	0.0	1
	052100332			36	0			36	1.0	1
	052100012			36	0			36	1.0	2
	052100842			36	0			36	1.0	3
	052100062			36	0			36	1.0	4
	006100112			36	18			18	2.0	2
	045100211	C++		64	56			8	4.0	2
	041100582			48	48				3.0	2
	041101391			48	48				3.0	3
	041100671			32	0	32			1.0	3
	041101051			32	0	32			1.0	4
				128	128				8.0	
				32	32				2.0	
				1060	766	64		230	49.0	

	040101591			48	48				3.0	1
	040100111			80	80				5.0	1
	040102661			32	32				2.0	1
	040100931			80	80				5.0	2
	040100282			80	80				5.0	1
	040100352			96	96				6.0	2
	040101311			96	96				6.0	3
	040100081			64	64				4.0	3
	040100492			64	64				4.0	3
	040100162			48	48				3.0	4
	040100801			64	64				4.0	4
	040102712	Introduction to Statistical Learning and Data Science		64	64				4.0	4
	040101053			80	80				5.0	5
	040102481			48	48				3.0	5
	040100671			64	64				4.0	5
	040102021			48	48				3.0	6
	040101071			64	64				4.0	6
				1120	1120				70.0	
	040100131			64	64				4.0	3
	040100061			64	64				4.0	4
	040101131			64	64				4.0	4
	040100871			48	16			32	2.0	4
	040101061			64	64				4.0	4
	040101011			64	64				4.0	4
	040102322			64	64				4.0	5
	040102271			32	32				2.0	5
	040102761			48	48				3.0	5
	040101181			64	64				4.0	6
	040100442			48	48				3.0	6
	040100981			64	64				4.0	6

	040102671		56	40			16	3.0	3
	040100482		48	48				3.0	3
	040102691		32	32				2.0	3
	040101572	Statistics	48	48				3.0	4
	040102241		48	48				3.0	4
	040102361		64	64				4.0	4
	040101471		64	64				4.0	4
	040100121		64	64				4.0	4
	040102561		48	48				3.0	5
	040102451		64	64				4.0	5
	040101642		64	64				4.0	5
	040100181		48	48				3.0	5
	040102701		80	80				5.0	5
	040102681		80	80				5.0	5
	040102282	The Qualitative Methods and Numerical Simulation for Differential Equations	64	64				4.0	5
	040101721		64	64				4.0	5
	040102091		32	32				2.0	6
	040102461		48	48				3.0	6
	040101032		32	32				2.0	6
	040102751		48	48				3.0	6
	040101331		48	48				3.0	6
	040100301		64	64				4.0	6
	040101531		64	64				4.0	6
	040102731		48	48				3.0	6
	040102771		32	32				2.0	6
	040102501		48	48				3.0	7
	040102471		48	48				3.0	7
	040102741		64	64				4.0	7
	040101581		48	48				3.0	8
	020100051		32				32	2.0	7
	020100041	I	32				32	2.0	7
	020100031	II	32				32	2.0	7
	020100061		32				32	2.0	7
						21			

I

II

006100151			2		2.0	1
031101551			2		2.0	3
040101521			2		2.0	3-4
040100841			2		2.0	4-5
040102581			2		2.0	5-6
040102511			2		2.0	5-6
040100361			2		2.0	3-4
040101462			3		3.0	4-5
040102352			2		2.0	4-5
040102711			3		3.0	4-5
040100292			2		2.0	5-6
040102331			2		2.0	5-6
040100973			4		4.0	8
040100263			15		10.0	8
			31		26.0	
			4.0			

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	II								

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Statistics

Program Code: 071201

Duration 4 years

Educational Objectives:

The overall goal is to cultivate talents with excellent moral character, broad and solid foundation, innovative thinking, outstanding abilities, and professional expertise, who possess the socialist values, all-round development in morality, intelligence, physical fitness, aesthetics, and labor, and who are oriented towards the major strategic needs of the country, adaptable to social development and technological progress, with a solid foundation and broad professional knowledge in the field of statistics, and interdisciplinary abilities in mathematical modeling, quantitative analysis, and innovative thinking, who are capable of applying professional technical knowledge such as higher education teaching, scientific and technological research, and engineering.



№2. Accomplishments in natural science and Humanities: Having good accomplishments in science and cultural literacy. Understand the basic and cutting-edge knowledge of natural science and social science disciplines.

№3. Professional knowledge and accomplishment: Mastering the solid knowledge of mathematics and professional knowledge. Having good mathematical thought and mathematical literacy.

№4. Analysis and problem-solving: An ability to analyze and solve practical problems by using mathematics and professional knowledge and computer technology.

№5. Research: Familiar with the advanced professional knowledge. An ability to conduct investigations of theory and application problems based on scientific theories and adopting scientific methods.

№6. Communication: An ability to communicate effectively with the peers and with society at large, and communicate in cross-cultural contexts with international perspective.

№7. Teamwork: Sense of teamwork and ability to function effectively as a member or leader.

№8. Lifelong Learning: Awareness in independent learning and lifelong learning. Ability to learn and adapt to the development.

Educational Objectives Student Outcomes	Educational Objectives 1	Educational Objectives 2	Educational Objectives 3	Educational Objectives 4
Moral cultivation and professional ethics				
Accomplishments in natural science and Humanities				
Professional knowledge and accomplishment				
Analysis and problem-solving				
Research				
Communication				
Teamwork				
Lifelong Learning				

Program Profile

This specialty is the National characteristic one and the Guangdong provincial key one. It began to enroll when the Department of Engineering Mathematics was set by South China University of Technology in 1958. It aims at training creative elite personnel who are well developed morally, intellectually and physically, possessing solid academic foundation with high quality and flexible adaptation to new

...of the ... development trends ... sciences ...
... mathematical knowledge ... (including some statistical methods) and ... mathematical modeling methods ... to ...
... and solve problems using computer in problem solving.

Most graduates will have research ... highly qualified special ... and pursue their
future careers in science and technology, education, economic and corporate, business and ...
departments for research and teaching in research institutes, or in the production and operation and
management engaged in practical applications, research and development and management. It also paves
way for further study in a mathematical-related professional. It has further engaged in high level scientific
research in all areas of mathematics, applied mathematics and cross subjects.

This specialty has good conditions for running schools and a strong faculty. There are 40 full-time
teachers, including 16 professors, 18 associate professors and 6 lecturers. There are 8 talents at or above the
provincial and ministerial level, such as the “Guangdong Special Support Program” Hundred, Thousand,
Ten Thousand Talents Project young talents, the outstanding teachers of Guangdong Nanyue, and the
Global and National High-level Talents. There are totally 16 teachers owning provincial and ministerial
titles and 13 doctoral supervisors. It has a library of 105 square meters and 6667 books, including 1834
copies of English Yellow Book. Rich collection of books and network resources greatly meet the needs of
teachers and students to study and work.

Last five years, we have held many international or domestic academic seminars. We also have invited
more than 400 domestic and foreign experts to visit our school, including two Fields prize winners and 14
academicians. We also strengthen the international exchanges and cooperation, including carrying out the
joint training program with University of Western Ontario, University of Birmingham, and University of
Edinburgh and so on.

Program Features:

The program focuses on the training goal of innovative high-level talents, emphasizes the computer
technology and statistical ...

Models Probability Theory Mathematical Statistics Regression Analysis Multivariate Statistical Analysis
Time Series Analysis Stochastic Processes Introduction to Statistical Learning and Data Science

Featured Courses:

Freshmen Seminars: Introduction to the Mathematics Speciality

Special Topics: Mathematical Models

Bilingual Courses: Stochastic Processes Abstract Algebra

Courses Taught in English: Statistics Introduction to Statistical Learning and Data Science The Qualitative Methods and Numerical Simulations of Differential Equations

Subject Frontiers Courses: The Qualitative Methods and Numerical Simulation for Differential Equations

Interdisciplinary Courses: Introduction to Statistical Learning and Data Science

Baccalaureate-Master's Sharing Courses: Measure theory Advanced Mathematical Statistics

Innovation Practice: Mathematical Models (Course Design)

Entrepreneurship Courses: Mathematical Models (Course Design)

Special Designs: Mathematical Models Selected Topics on Analysis and Algebra

Education on The Hard-Working Spirit: Mathematical Technology Practice

1. Registration Form of Curriculum Credits

1.1 Credits Registration Form

12 Credits Registration Form									
Course Category		Requirement			Credits		Academic Hours		Remarks
General Basic Courses		Compulsory			39.0		900		
		General Education			10.0		160		
Specialty Basic Courses		Compulsory			70.0		1120		
Elective Courses		Elective			21.0		336		
Total					140.0		2420		
Practice Training		Compulsory			26.0		31 weeks		
		Elective			4.0		4 weeks		
Credits Required for Graduation		140.0+30.0=170.0							
Suggested Credits for Each Semester		1	2	3	4	5	6	7	8
		23.5	27	26	24.5	20	21	14	14

1.2 Category Registration Form

Academic Hours					Credits						
Total	Include		Include		Total	Include		Include			Include
	Compulsory	Elective	Theory Course	Lab		Compulsory	Elective	Practice-concentrated Training	Theory Course Credits	Lab	Innovation and Entrepreneurship Education
2420	1924	496	2046	374	170	134	36	30	128.5	11.5	11

Remark.

(1) General education courses are included as an elective.

(2) Experimental teaching includes experiments, internships, and others in the "Professional Teaching Plan".

(3) Innovation and entrepreneurship education credits: courses in the training plan are recognized by the teaching guidance committee of each department, including credit courses such as

competition-oriented courses, innovative practice courses, and entrepreneurship education courses.

- (4) Required hours + elective hours = total hours; theoretical teaching hours + experimental teaching hours = total hours; required credits + elective credits = total credit hours; concentrated practical teaching credits + theoretical teaching credits + experimental teaching credits = total credit hours.

2. Courses Schedule

Course Category	Course No.	Course Title		C/E	Total Curriculum Hours					Credits	Semester
					Class Hours	Theoretic al class hours	Lab Hours	Practice Hours	Other Hours		
General Basic Courses	031101661	Ethics and Rule of Law		C	40	36			4	2.5	1
	031101761	The Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era			48	36			12	3.0	2
	031101371	Skeleton of Chinese Modern History			40	36			4	2.5	4
	031101424	Thought of Mao ZeDong and Theory of Socialism with Chinese Characteristics			40	36			4	2.5	3
	031101522	Fundamentals of Marxism Principle			40	36			4	2.5	3
	031101331	Analysis of the Situation & Policy			64	64				2.0	1-8
	044101382	English for Academic Purposes (1)	for English Class A		48	48				3.0	1
	044102453	English for Academic Purposes (2)			48	48				3.0	2
	044103681	College English (1)	for English Class B C		48	48				3.0	1
	044103691	College English (2)			48	48				3.0	2
	045101643	Foundations of Computer			32	0			32	0	1
	052100332	Physical Education (1)			36	0			36	1.0	1
	052100012	Physical Education (2)			36	0			36	1.0	2
	052100842	Physical Education (3)			36	0			36	1.0	3
	052100062	Physical Education (4)			36	0			36	1.0	4
	006100112	Military Principle			36	18			18	2.0	2
	045100211	Programming in C++			64	56			8	4.0	2
	04 10	General Physics (1)			48	48				3.0	2
	0 11 1	General Physics (2)			48	48				3.0	3
	0 10 6 1	Physics Experiment (1)			32	0	32			1.0	3
	0 10 0 1	Physics Experiment (2)			32	0	32			1.0	4
		Humanities, Social Science		E	128	128				8.0	
		Science and Technology			32	32				2.0	
		Total			1060	766	64		230	49.0	

2. Courses Schedule

Course Category	Course No.	Course Title	C/E	Total Curriculum Hours					Credits	Semester
				Class Hours	Theoretical class hours	Lab Hours	Practice Hours	Other Hours		
Specialty Basic Courses	040101591	Analytic Geometry	C	48	48				3.0	1
	040100111	Advanced Algebra I	C	80	80				5.0	1
	040102661	Introduction to Mathematics Speciality	C	32	32				2.0	1
	040100931	Advanced Algebra II	C	80	80				5.0	2
	0401 282	Mathematical Analysis (1)	C	80	80				5.0	1

040100671	Multivariate Statistical Analysis	C	64	64				4.0	5
040102021	Time Series Analysis	C	48	48				3.0	6
040101071	Stochastic Processes	C	64	64				4.0	6
Total		C	1120	1120				70.0	
Specialty elective courses									
040100131	Ordinary Differential Equations	E	64	64				4.0	3
040100061	Functions of a Complex Variable	E	64	64				4.0	4
040101131	Operational Research	E	64	64				4.0	4
040100871	Mathematics Software and Mathematics Experiments	E	48	16			32	2.0	4
040101061	Algorithm Analysis and Design	E	64	64				4.0	4
040101011	Numerical Analysis	E	64	64				4.0	4
040102322	Numerical Optimization Algorithms	E	64	64				4.0	5
040102271	Big Data Application	E	32	32				2.0	5
040102761	Portfolio and Risk Analysis	E	48	48				3.0	5
040101181	Functional Analysis	E	64	64				4.0	6
040100442	Mathematical Finance	E	48	48				3.0	6
040100981	Computational Intelligence	E	64	64				4.0	6
Total		E	Minimum specialty elective course credits required:17						
Arbitrary elective courses									
040102671	Object-oriented Programming	E	56	40			16	3.0	3
040100482	Discrete Mathematics	E	48	48				3.0	3
040102691	Selected Topics on Analysis and Algebra	E	32	32				2.0	3
040101572	Statistics	E	48	48				3.0	4
040102241	Matrix Computations	E	48	48				3.0	4
040102361	Database Systems	E	64	64				4.0	4
040101471	Combinatorics and Graph Theory	E	64	64				4.0	4
040100121	Differential Geometry	E	64	64				4.0	4
040102561	Bayesian Statistics and Knowledge Inference	E	48	48				3.0	5
040102451	Quantum Information and Quantum Computation	E	64	64				4.0	5
040101642	Microeconomics	E	64	64				4.0	5
040100181	Numerical Methods of Differential Equation	E	48	48				3.0	5
040102701	Abstract Algebra	E	80	80				5.0	5
040102681	Topology	E	80	80				5.0	5
040102282	The Qualitative Methods and Numerical Simulation for Differential Equations	E	64	64				4.0	5
040101721	Elementary Number Theory	E	64	64				4.0	5
040102091	Nonparametric Statistics	E	32	32				2.0	6

040102461	Monte Carlo Methods with some Applications	E	48	48	3.0	6
040101032	Macroeconomics	E	32	32	2.0	6
040102751	Finite Element Method and Computation	E	48	48	3.0	6
040101331	Computer Graphics	E	48	48	3.0	6
040100301	Equations of Mathematical Physics	E	64	64	4.0	6
040101531	Foundations of Algebra	E	64	64	4.0	6
040102731	Computational Fluid Dynamics	E	48	48	3.0	6
040102771	Nonsmooth Convex Optimization Algorithms	E	32	32	2.0	6
040102501	Actuary of Life Insurance	E	48	48	3.0	7
040102471	Thoughts and M					

3. Practice-concentrated Training

Course No	Course Title	C/E	Total Curriculum Hours		Credits	Semester
			Practice weeks	Lecture Hours		
006100151	Military Training	C	2 weeks		2.0	1
031101551	Marxism Theory and Practice	C	2 weeks		2.0	3
040101521	Data Structures Course Design	C	2 weeks		2.0	3-4
040100841	Mathematical Models Course Design	C	2 weeks		2.0	4-5
040102581	Mathematical Technology Practice	C	2 weeks		2.0	5-6
040102511	Regression Analysis Course Design	C	2 weeks		2.0	5-6
040100361	Object-oriented Programming Course Design	E	2 weeks		2.0	3-4
040101462	Numerical Analysis Course Design	E	3 weeks		3.0	4-5
040102352	Application of Database Course Design	E	2 weeks		2.0	4-5
040102711	Introduction to Statistical Learning and Data Science Course Design	E	3 weeks		3.0	4-5
040100292	Numerical Methods of Differential Equation (Course Project)	E	2 weeks		2.0	5-6
040102331	Big Data Applications (Course Project)	E	2 weeks		2.0	5-6
040100973	Graduation Practice	C	4 weeks		4.0	8
040100263	Graduation Project	C	15 weeks		10.0	8
Total		C	31 weeks		26.0	
		E	Minimum elective course credits required: 4.0			

4.Relation Matrix between Curriculum System and Student Outcomes

Serial No.	Course Title	Major Student Outcomes							
	Ethics and Rule of Law	•	•				•		•
	The Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	•	•				•		•
	Skeleton of Chinese Modern History	•	•				•		•
	Thought of Mao ZeDong and Theory of Socialism with Chinese Characteristics	•	•				•		•
	Fundamentals of Marxism Principle	•	•				•		•
	Analysis of the Situation & Policy	•	•				•		•
	English for Academic Purposes (1)						•		•
	English for Academic Purposes (2)						•		•
	College English (1)						•		•
	College English (2)						•		•
	Foundations of Computer	•			•				•
	Physical Education (1)	•					•	•	•

	Physical Education (2)	•					•	•	•
	Physical Education (3)	•					•	•	•
	Physical Education (4)	•					•	•	•
	Military Principle	•							•
	Programming in C++		•	•	•			•	•
	Data Structure			•	•	•			•
	General Physics (1)		•						•
	General Physics (2)		•						•
	Physics Experiment (1)		•				•	•	•
	Physics Experiment (2)		•				•	•	•
	Mathematical Analysis (1)			•		•			•
	Mathematical Analysis (2)			•		•			•
	Mathematical Analysis (3)			•		•			•
	Analytic Geometry			•		•			•
	Advanced Algebra I			•		•			•
	Introduction to Mathematics Speciality	•	•			•			•
	Advanced Algebra II			•		•			•
	Probability Theory			•		•			•
	Mathematical Models			•	•				•
	Mathematical Statistics			•	•				•
	Introduction to Statistical Learning and Data Science			•	•				•
	Real Variable Function			•		•			•

	Regression Analysis			•	•				•
	Multivariate Statistical Analysis			•	•				•
	Time Series Analysis			•	•				•
	Stochastic Processes			•	•				•
	Ordinary Differential Equations			•		•			•
	Functions of a Complex Variable			•		•			•
	Operational Research			•		•			•
	Mathematics Software and Mathematics Experiments				•				•
	Algorithm Analysis and Design				•				•
	Numerical Analysis			•	•				•
	Numerical Optimization Algorithms			•	•				•
	Big Data Application			•	•				•
	Functional Analysis			•		•			•
	Mathematical Finance			•		•			•
	Computational Intelligence			•	•				•
	Object-oriented Programming			•	•				•
	Discrete Mathematics			•		•			•
	Selected Topics on Analysis and Algebra			•		•			•
	Statistics			•	•				•
	Matrix Computations			•	•				•
	Database Systems			•		•			•
	Combinatorics and Graph Theory			•		•			•
	Differential Geometry			•		•			•
	Bayesian Statistics and Knowledge Inference			•		•			•
	Quantum Information and Quantum Computation			•		•			•
	Numerical Methods of Differential Equation			•	•				•

	Abstract Algebra							
	Topology							
	The Qualitative Methods and Numerical Simulation for Differential Equations							
	Elementary Number Theory							
	Microeconomics							
	Nonparametric Statistics							
	Monte Carlo Methods with some Applications							
	Finite Element Method and Computation							
	Computer Graphics							
	Equations of Mathematical Physics							
	Macroeconomics							
	Foundations of Algebra							
	Computational Fluid Dynamics							
	Actuary of Life Insurance							
	Thoughts and Methods in Differential Equations							
	Riemann Surface and Riemann Geometry							
	Computer Networks							
	Nonsmooth Convex Optimization Algorithms							
	Innovation Research Training							
	Innovation Research Practice I							
	Innovation Research Practice II							
	Entrepreneurial Practice							
	Portfolio and Risk Analysis							

5.“Second Classroom” Activities

“Second Classroom” Activities are comprised of two parts, Humanities Quality Education and Innovative Ability Cultivation.

1)Basic Requirements of Humanities Quality Education

Besides gaining course credits listed in one’s subject teaching curriculum, a student is required to participate in extracurricular activities of Humanities Quality Education based on one’s interest, acquiring no less than five credits. The advanced undergraduates must complete one of courses of Humanities Quality Education which has seventy-two class hours (it's equivalent to one credit which belongs to Humanities Quality Education Credit of Extracurricular Class) offered by the College Physical Education Teaching Group. Mental Health Education for College Students (2 credits) is opened in virtual third semester which belongs to Humanities Quality Education Credit of Extracurricular Class.

2)Basic Requirements of Innovative Ability Cultivation

Besides gaining course credits listed in one’s subject teaching curriculum, a student is required to participate in any one of the following activities: National Undergraduate Training Programs for Innovation and Entrepreneurship, Guangdong Undergraduate Training Programs for Innovation and Entrepreneurship, Student Research Program (SRP), One-hundred-steps Innovative Program, or any other extracurricular activities of Innovative Ability Cultivation that last a certain period of time (e.g. subject contests, academic lectures), acquiring no less than four credits.