



Attachment II:

1. Major course list of JBNU acceptable in YZU

a. Electronics Engineering (Master and Ph.D)

Code #	Lecture name (English)	Credits
0000528653	3D Semiconductor Devices	3
0000527598	3D Robot Vision	3
0000527938	AI system	3
0000527216	Glocal-IT Seminar 1	1
0000527258	Glocal-IT Seminar 2	1
0000523817	IT Application Seminar 1	3
0000523818	IT Application Seminar 2	3
0000527191	JIANT-IT Seminar 1	2
0000527192	JIANT-IT Seminar 2	2
0000527194	JIANT-IT Field Practice 1	1
0000527195	JIANT-IT Field Practice 2	2
0000523374	Introduction to MEMS	3
0000523375	Fabrication Process for MEMS	3
0000523376	MEMS design_part 1	3
0000523377	MEMS design_part 2	3
0000523378	MEMS Application	3
0000523379	Advanced MEMS Technology	3
0000523700	RF IC Design-SoC	3
0000523388	Special Topics in RF System Design	3
0000526372	Clock and Sine Signal Generation for SoC realization	3
0000521292	SoC Design Methodology	3
0000521384	Introduction to VLSI Systems for SoC Designers	3
0000521291	SoC Architecture	3
0000520181	Advanced VLSI Design	3
0000516310	VLSI Signal Processing	3
0000526047	Robust Control	3
0000528654	Detection and Estimation	3
0000527594	Advanced MOS Device Physics	3
0000523814	Advanced Mobile Contents Convergence System	3
0000525161	Advanced Linear Algebra	3
0000527211	Advanced image processing	3
0000516095	Advanced Engineering Electromagnetics	3
0000523816	Advanced Communication Software Design	3
0000521393	High Performance Memory Architecture and Design	3



0000523334	High Speed Data Converter and Systems	3
0000525158	Analog Filter Design for High Frequency Applications	3
0000525156	High Frequency Electronics Devices	3
0000523335	Random Processes in Engineering	3
0000520721	Optical Measurement Engineering	3
0000523336	Ultra Wideband Communication	3
0000523337	Fiber-optic Sensor System	3
0000520720	Optical Signal Processing	3
0000527213	AC Power Conversion	3
0000526374	Graph Theory and its applications	3
0000527939	Machine Learning I	3
0000527205	machine learning II	3
0000527936	Nano Optics	3
0000515312	Studies in Thesis	3
0000527310	Research Skill, Writing, and Ethic	3
0000521376	Multi-carrier Transmission Technology	3
0000527601	Multi-User Communication	3
0000527600	MIMO Communication	3
0000524793	Display Engineering 1	3
0000524794	Display Engineering 2	3
0000523340	Digital Geometry	3
0000527209	Introduction to Digital Signal Processing	3
0000511322	Applications of Digital Signal Processing	3
0000522175	Advanced Digital Signal Processing-SoC	3
0000521377	Introduction of Digital Satellite Communications	3
0000511328	Digital Mobile Communication	3
0000522176	Digital Integrated Circuit -SoC	3
0000527207	Introduction to Digital Communications	3
0000523341	Digital Communication Signal Processing	3
0000516505	Digital Filter Design	3
0000525767	Fundamentals of deep learning	3
0000525768	Advanced topics in deep learning	3
0000525744	Deep Learning Programming	3
0000511353	Advanced Robotics	3
0000523330	Introduction to Robot Vision System	3
0000523331	Advanced Robot Vision	3
0000521383	Analysis and Design of Microprocessor Systems	3



0000511397	Multimedia Communication	3
0000524788	Wireless coverage networking	3
0000527204	advanced wireless communications	3
0000525160	Recent Trend on Wireless Communication Circuits	3
0000525159	Monolithic mm-wave Integrated Circuits	3
0000523343	Biosensor	3
0000524811	Bioinformatics	3
0000527198	Bioinformatics Application	3
0000527934	Semiconductor Display Fabrication Practice	3
0000528651	Characterization of Semiconductor Devices	3
0000525737	Parallel Computer Vision	3
0000523347	Nonlinear Control	3
0000516239	Nonlinear Control System	3
0000516298	Analysis and Design of Nonlinear Microwave Circuit	3
0000527937	New Technology Commercialization with Industry	3
0000512063	Biology Engineering	3
0000526375	Linear System and Control	3
0000516240	Linear System Theory	3
0000515061	Sensor Application	3
0000525471	Cellular Communications 1	3
0000525472	Cellular Communications 2	3
0000527599	Advanced Smart Mobility	3
0000523821	Switched Mode Power Supplies	3
0000523350	Space Time Multi Input Multi Output Communication	3
0000527593	Semiconductor Manufacturing Technology	3
0000527595	Advanced Topics in System Semiconductor	3
0000522249	Advanced Neural Networks	3
0000527201	Renewable Energy Device	3
0000523447	Special topics in Signals and Systems	3
0000526373	Analog Subcircuit Design	3
0000518966	Antenna Engineering	3
0000524494	Special Topics in Antenna Engineering	3
0000527218	Energy Conversion System Design	3
0000515128	Vision-Based Control	3
0000524789	Image Analysis and Understanding	3
0000525743	Vision Intelligence	3
0000527208	Introduction to Image Processing	3



0000512986	Advanced Digital Image Processing	3
0000524802	Technical Writing for Thesis in English	3
0000521378	Introduction of Error Correction Coding	3
0000523353	Advanced error correction coding theory	3
0000527596	Wearable Electronics System	3
0000523813	Topics in Ubiquitous Communication	3
0000520804	Applied Optics	3
0000523355	Advanced Medical Instrumentation	3
0000525465	Parallel Processing of Biomedical Imaging	3
0000523356	Biomedical Measurement and Control	3
0000523386	Principles of the Design of Biomedical Instrumentation	3
0000523358	Advanced Topics in Biomedical Engineering	3
0000523359	Biomedical Imaging Systems	3
0000523360	Advanced Mobile Robotics	3
0000523361	Vehicular Information & Electronics Engineering	3
0000523387	Advanced Human Robot Interaction	3
0000527199	AI based Biology Engineering	3
0000526368	Semiconductor for Artificial Intelligence	3
0000513355	Advanced artificial intelligence	3
0000522183	Embedded SW Programming	3
0000526371	Readout Circuit Design for Magnetic Sensor	3
0000516949	Advanced Automatic Control	3
0000525740	CAN Security for Automobiles	3
0000523364	Introduction to Autonomous Mobile Robot	3
0000523820	Power Conversion Circuit Design and Control	3
0000527217	Basic Power Electronics	3
0000527214	Power Electronics System Design	3
0000522247	Advanced Electronics Lab.	3
0000524800	Advanced Electronics Engineering 1	3
0000524801	Advanced Electronics Engineering 2	3
0000517185	Special Topics in Electromagnetics	3
0000524492	Electromagnetic Field Theory	3
0000513694	Advanced Electronic Circuits	3
0000524493	Wave Propagation Engineering	3
0000527200	Drug Engineering Special Topic	3
0000513794	Advanced Control Engineering	3
0000523366	Introduction to Intelligent Robot	3



0000523367	Advanced Intelligent Robotics	3
0000527193	Advanced Intelligent Programming	3
0000522184	Intelligent Agricultural Machines	3
0000525746	Intelligent Robot Control	3
0000522185	Intelligent Vehicle	3
0000527203	Nanophotonics for Autonomous Vehicle	3
0000524488	Smart Grid and Electric Vehicles	3
0000527215	Intelligent Electronic Capstone Design 1	3
0000527190	Intelligent Electronic Capstone Design 2	3
0000527935	Intellectual Property Licensing and Startup	3
0000525741	In Vehicle Communication	3
0000525742	Design of Automotive SoCs	3
0000525739	Real-time Operating System for Automobile	3
0000528652	Next-Generation Power Semiconductors	3
0000520184	Microwave Active Circuit 1	3
0000520185	Microwave Active Circuit 2	3
0000516307	Microwave Filter Design	3
0000515159	Microwave Communication	3
0000525464	Basic Theory for Ultrasonic Biomedical Imaging	3
0000516247	Optimal Control	3
0000514126	Optimization Theory	3
0000516479	Computer Vision	3
0000514333	Statistical Thermodynamics	3
0000522242	Communication System Design-SoC	3
0000525469	Optimization of Communication Systems 1	3
0000525470	Optimization of Communication Systems 2	3
0000516481	Communication Signal Processing	3
0000525157	Analog and RF Integrated Circuits for Communications	3
0000514355	Very Large Scale Integrated Circuits for Communication	3
0000527206	Communications Theory	3
0000526048	Special Control Problems	3
0000514395	Advanced Pattern Recognition	3
0000523370	Fundamentals of Photonics	3
0000527597	Probabilistic Robotics	3
0000516550	Probability & Random Process	3
0000523372	Network Synthesis and Filter IC Design	3

b. Computer Science and Engineering (Master and Ph.D)



Code #	Lecture name (English)	Credits
0000522203	Ad-hoc Network System	3
0000527216	GlocalT-IT Seminar 1	1
0000527258	GlocalT-IT Seminar 2	1
0000527191	JIANT-IT Seminar 1	2
0000527192	JIANT-IT Seminar 2	2
0000527194	JIANT-IT Field Practice 1	1
0000527195	JIANT-IT Field Practice 2	2
0000523010	Advanced SOA	3
0000515301	Advanced Virtual Reality	3
0000515302	Advanced Visualization	3
0000515306	Object-Oriented Database	3
0000515307	Advanced Game Engineering	3
0000524807	Fault Tolerant System	3
0000522206	Computational Geometry	3
0000510256	Advanced ComputationTheory	3
0000524815	High Level Database	3
0000510279	Advanced Numerical Analysis	3
0000524808	Advanced Computer Design	3
0000522233	Advanced Computer Programming	3
0000510324	Advanced Intelligent Network	3
0000522186	Seminar in High-Performance Computing	3
0000525474	Seminar On Public Safety Convergence Technologie	3
0000510540	Broadband Communication System	3
0000516382	Advanced Optical Communication Network	3
0000522187	Grid Computing	3
0000526458	Machine Learning and Applications	3
0000525968	Advanced Topics in Machine Learning	3
0000522208	Geometrical Solid Modeling	3
0000516385	Network Modeling	3
0000520881	Network Security	3
0000522195	Advanced Network Security	3
0000515312	Studies in Thesis	3
0000527310		3
0000511123	Database Design	3
0000511126	Database Applications 1	3
0000511127	Database Applications 2	3



0000525473	Advanced Data Science	3
0000522216	Seminar in Database	3
0000524814	Database system	3
0000522241	Advanced Database	3
0000522215	Data Warehousing	3
0000520285	Advanced Data Communication	3
0000524813	Advanced Digital Broadcast	3
0000511319	Advanced Digital Systems	3
0000525678	Deel Learning	3
0000525768	Advanced topics in deep learning	3
0000522383	Rough Set Theory and Application	3
0000522209	Seminar in Multimedia Engineering	3
0000515319	Advanced Multimedia Document Structuring	3
0000522210	Multimedia Document Classification	3
0000522204	Advanced Multimedia Contents	3
0000522193	Advanced Multimedia Communication	3
0000522212	Mobile Graphics	3
0000524809	Cognitive Radio Engineering	3
0000522234	Seminar in Culture & Image and Regional Information Industry	3
0000524811	Bioinformatics	3
0000526426	Probabilistic graphical models	3
0000516396	Parallel & Distributed Database	3
0000511684	Parallel Computers	3
0000522188	Advanced Parallel Programming	3
0000511764	Distributed Systems	3
0000525475	Advanced Internet of Things Service	3
0000527937	New Technology Commercialization with Industry	3
0000522226	Seminar in Software Engineering	3
0000512358	Advanced Software Engineering	3
0000522189	Seminar in System Software	3
0000524805	Advanced System Programming	3
0000512599	Advanced System Programming	3
0000522191	Realtime System	3
0000515334	Seminar in Realtime System	3
0000522190	Advanced Realtime System	3
0000512835	Advanced Algorithm	3
0000512986	Advanced Image Processing	3



0000524802	Technical Writing for Thesis in English	3
0000526211	Audio Information and Recognition	3
0000513065	Advanced Operating System	3
0000524810	Advanced Web Engineering	3
0000522196	Satellite Communication and Network	3
0000522220	Genetic Algorithm Theory and Application	3
0000515339	Mobile Computing	3
0000522197	Advanced Mobile Network	3
0000524806	Advanced Human Computer Interaction	3
0000520882	Advanced Artificial Life	3
0000527314	GPU Programming	3
0000513355	Advanced Artificial Intelligence	3
0000525749	Cognitive Computing	3
0000522198	Internet Service Architecture	3
0000522192	Advanced Embedded System	3
0000513467	Topics in Natural Language Processing	3
0000522229	Advanced Computational Mathematics	3
0000522217	Seminar in Information Retrieval	3
0000515344	Topics in Information Retrieval	3
0000520292	Advanced Information Security	3
0000513726	Advanced Information Theory	3
0000522231	Formal Methods	3
0000515346	Seminar in Formal Methods	3
0000522230	Advanced Formal Method	3
0000522222	Seminar in Intelligent Information	3
0000527193	Advanced Intelligent Programming	3
0000522223	Intelligent Robot	3
0000522224	Intelligent Agent	3
0000527257	Intelligent Computer Capstone Design 1	3
0000527259	Intelligent Computer Capstone Design 2	3
0000515348	Geographical Information System	3
0000522214	Knowledge Engineering	3
0000515350	Information Representation System	3
0000524812	Advanced Optimization Theory	3
0000524803	Advanced Computer Engineering 1	3
0000524804	Advanced Computer Engineering 2	3
0000515352	Advanced Computer Science	3



0000514224	Advanced Computer Architecture	3
0000514226	Advanced Computer Graphics	3
0000522194	Seminar in Computer Network	3
0000514228	Advanced Computer Network	3
0000522205	Advanced Computer Vision	3
0000525350	Computer System Security	3
0000515354	Advanced Computer Animation	3
0000522213	Seminar in Computer-Image Application	3
0000515229	Advanced Computer Communication	3
0000523833	Cloud Computing	3
0000522218	Text Data Mining	3
0000522201	Network Performance Analysis	3
0000522199	Communication Software Design	3
0000522202	Communication Optimization Theory	3
0000522200	Communication Protocol Engineering	3
0000516408	Advanced File Processing	3
0000514395	Advanced Pattern Recognition	3
0000514398	Fuzzy Set Theory and Application	3
0000516409	Korean Language Processing	3
0000520300	Modern Cryptography	3
0000525750	Probabilistic graphical models	3
0000522232	Advanced Probability and Statistics	3

2. Major course list of YZU acceptable in JBNU

a. Software Engineering (Master)

Course category		Course code	Course title	credit	semester	note
Degree courses 学位课	Public basic courses 公共基础课	M999X008	Matrix theory 矩阵论	3	秋	Any 1
		M13X090	Combinatorial Mathematics 组合数学	3	秋	
	Basic Courses 学科基础课	M13X104	Data Science and Engineering 数据科学与工程	2	autumn 秋	Compulsory 必修
		M13X129	Fundamentals of Software Engineering Theory 软件工程理论基础	2	Spring 春	
	Professional	M13X130	Software architecture 软件体系结构	2	spring	Compulsory 必修



Course category		Course code	Course title	credit	semester	note
程	basic courses 专业基础课		构		春	
		M13X131	Software Development Methodology 软件开发方法学	2	spring 春	
No n- deg ree cou rse s 非 学 位 课 程	Public Elective Courses 公共选修课	M999X016	Research Ethics and Academic Norms 科研伦理与学术规范	2	Spring , autum n 春秋	Compulsory 必修
		M999X017	How to Write Scientific Research Papers 如何写好科研论文	1	Sprint, autum n 春秋	
		M999X006	International Academic Exchange English 国际学术交流英语	2	spring 春	
	Professional Elective Courses 专业选修课	M13X117	Optimization Theory and Algorithm* 最优化理论与算法*	2	autum n 秋	1. Elective courses of at least 9 credits (interdisciplinary courses of at least 2 credits); 2. "*" refers to interdisciplinary courses. 1.至少选修9学分(跨学科课程至少2学分); 2.“*”为跨学科课程。
		M13X132	Large scale domain software system 大规模领域软件系统	2	spring 春	
		M13X110	Advanced Distributed System 高级分布式系统	2	spring 春	
		M13X113	Advanced AI 高级人工智能	2	spring 春	
		M13X121	modern cryptography 现代密码学	2	autum n 秋	
		M13X133	software security 软件安全	2	spring 春	
		M13X118	data mining 数据挖掘	2	spring 春	
		M13X114	New Software Theory and Technology 软件新理论与新技术	2	spring 春	
		M13X106	Theory and Model of Computer Programming 计算机程序设计理论与模型	2	spring 春	
		M13X103	Advanced Computer Network 高级计算机网络	2	spring 春	
		M13X116	Algorithm Game Theory and Mechanism Design* 算法博弈论与机制设计*	2	autum n 秋	
		M13X112	Software Systems and Engineering 软件系统与工程	2	autum n 秋	
		M13X134	Basic software and open source system 基础软件与开源系统	2	spring 春	
		M13X107	machine learning 机器学习	2	秋	
		M13X135	Software Engineering Management 软件工程管理	2	spring 春	



Course category		Course code	Course title	credit	semes ter	note
		M13X119	Advanced Software Engineering 高级软件工程	2	autum n 秋	
		M13X122	Theory and Methods of Knowledge Engineering 知识工程理论与方法	2	spring 春	
		M13X105	Discipline frontier and practice 学 科前沿与实践	1	autum n 秋	
		M13X136	Software analysis and testing 软件 分析与测试	2	spring 春	
		M13X137	Software Data Analysis Technology 软件数据分析技术	2	spring 春	
		M13X138	Software Requirements Engineering 软件需求工程	2	spring 春	
		M13X102	Advanced Algorithm Design and Analysis 高级算法设计与分析	2	autum n 秋	
		M13X111	Network and Information Security 网络与信息安全	2	spring 春	
Ma ke- up cou rse s 补 修 课 程	Undergraduate remedial courses 本科阶段 补修课程	10134045	Compilation principle 编译原理	0	spring 春	There shall be no less than 3 remedial courses for postgraduates with the same academic qualification or across majors. (not included Total credits)
		10134055	Software Engineering 软件工程	0	spring 春	
		21133103	Object Oriented Programming 面向 对象程序设计	0	spring 春	
		17133409	Operating System 操作系统	0	spring 春	
		14134801	Data structure and algorithm 数据 结构及算法	0	autum n 秋	
		10133041	Database principle 数据库原理	0	spring 春	
		14133409	discrete mathematics 离散数学	0	spring 春	
academic activities 学术活动				2	Compulsory (8 academic activities and 2 lectures required)	
Experiment Practice 实验实践环节				2	4 credits for entering the enterprise graduate workstation and passing the examination 进入企业研究生工作站并 考核合格, 记 4 学分	
Reward credits for innovation and entrepreneurship 创新创业奖励学分				2		



b. Software Engineering (Ph. D.)

Course category		Course code	Course title	credit	semester	note
Degree courses	Basic Courses 学科基础课	D13X001	mathematical logic 数理逻辑	2	Sprint/ autumn 春/秋	Any 2~4 credits 任选 2~4 学分
		D13X033	Fundamentals of Software Engineering Theory 软件工程理论基础	2	春/秋	
	Professional basic courses 专业基础课	D13X016	Software architecture 软件体系结构	2	春/秋	Any 2~4 credits 任选 2~4 学分
		D13X034	Advanced Software Engineering 高级软件工程	2	autumn 秋	
		D13X035	Software analysis and testing 软件分析与测试	2	春/秋	
		D13X036	Advanced AI 高级人工智能	2	spring 春	
	Public Elective Courses 公共选修课	M999X016	Research Ethics and Academic Norms 科研伦理与学术规范	2	春秋	Compulsory 必修
		M999X017	How to Write Scientific Research Papers 如何写好科研论文	1	春秋	
Non-degree courses	Professional Elective Courses 专业选修课	D13X009	Special Lecture on Frontier of Software Engineering 软件工程学科前沿专题讲座	1	spring 春	Any 2~4 credits 任选 2 学分
		D13X010	machine learning 机器学习	2	autumn 秋	
		D13X037	Algorithm Game Theory and Mechanism Design 算法博弈论与机制设计	2	autumn 秋	
		D13X003	Optimization Theory and Algorithm 最优化理论与算法	2	autumn 秋	
		D13X038	Basic software and open source system 基础软件与开源系统	2	spring/autumn 春/秋	
		D13X039	software security 软件安全	2	spring/autumn 春/秋	
		D13X040	Software Data Analysis Technology 软件数据分析技术	2	spring/autumn 春/秋	
		D13X041	Large scale domain software system 大规模领域软件系统	2	spring/autumn 春/秋	
		D13X042	Advanced Algorithm Design and Analysis 高级算法设计与分析	2	autumn 秋	
		D13X043	Theory and Model of Computer Programming 计算机程序设计理论与模型	2	spring 春	



Course category		Course code	Course title	cred it	semeste r	note
		D13X044	Theory and Methods of Knowledge Engineering 知识工程理论与方法	2	spring 春	
		D13X045	Advanced Distributed System 高级分布式系统	2	spring 春	
		D13X032	data mining 数据挖掘	2	spring 春	
		D13X046	Software Engineering Management 软件工程管理	2	spring/autum 春/秋	
		D13X024	Network Security Theory and Technology 网络安全理论与技术	2	spring/autum 春/秋	
		D13X025	Cryptography 密码学	2	spring/autum 春/秋	
		D13X047	Advanced Computer Network 高级计算机网络	2	spring/autum 春/秋	
		D13X048	Software Systems and Engineering 软件系统与工程	2	spring/autum 春/秋	
		D13X028	pattern recognition 模式识别	2	autumn 秋	
		M999X018	English Scientific Paper Writing and Academic Reports 英文科技论文写作与学术报告	2	autumn 秋	
		M999X021	Social innovation and entrepreneurship 社会创新与创业	1	autumn 秋	
		M999X022	English Grammar and Writing Style 英语语法和写作风格	0.5	autumn 秋	
Make-up Courses 补修课程	Postgraduate remedial courses 补修课程	M13X131	Software Development Methodology 软件开发方法学	0	spring 春	No credit counted 不计学分
		M13X051	Object Oriented Technology 面向对象技术	0	spring 春	
		M13X028	Computer Network Technology 计算机网络技术	0	spring 春	
D13X049 academic activities 学术活动				2	Compulsory 必修	

c.Computer Science and Technology (Master)

Course category		Course code	Course title	credit	semester	note
Deg	Public basic	M999X008	Matrix theory 矩阵论	3	autum	(二选一)



Course category		Course code	Course title	credit	semester	note
Degree Courses 学位课程	Public Basic Courses 公共基础课				Autumn	
		M13X090	Combinatorics 组合数学	3	Autumn	
	Basic Courses 学科基础课	M13X101	Advanced Computer Architecture 高级计算机体系结构	2	Spring	Compulsory 必修
		M13X102	Advanced Algorithm Design and Analysis 高级算法设计与分析	2	Autumn	
	Professional basic courses 专业基础课	M13X103	Advanced Computer Network 高级计算机网络	2	Spring	Compulsory 必修
		M13X104	Data Science and Engineering 数据科学与工程	2	Autumn	
Non-degree Course 非学位课程	Public Elective Courses 公共选修课	M999X016	Research Ethics and Academic Norms 科研伦理与学术规范	2	Spring, Autumn	Compulsory 必修
		M999X017	How to Write Scientific Research Papers 如何写好科研论文	1	Spring, Autumn	
	Professional Elective Courses 专业选修课	M13X105	Discipline frontier and practice 学科前沿与实践	1	Autumn	1. Elective courses for at least 9 credits (interdisciplinary courses for at least 2 credits) 2. "*" is an interdisciplinary course 1.至少选修9学分(跨学科课程至少2学分) 2.“*”为跨学科课程
		M13X106	Theory and Model of Computer Programming 计算机程序设计理论与模型	2	Spring	
		M13X107	machine learning 机器学习	2	Autumn	
		M13X110	Advanced Distributed System 高级分布式系统	2	Spring	
		M13X111	Network and Information Security 网络与信息安全	2	Spring	
		M13X112	Software Systems and Engineering 软件系统与工程	2	Autumn	
		M13X113	Advanced AI 高级人工智能	2	Spring	
		M13X114	New Software Theory and	2	Spring	



Course category		Course code	Course title	credit	semes ter	note
			Technology 软件新理论与新技术		春	
		M13X115	Formal method 形式化方法	2	spring 春	
		M13X116	Algorithm Game Theory and Mechanism Design* 算法博弈论与机制设计*	2	autum n 秋	
		M13X117	Optimization Theory and Algorithm* 最优化理论与算法*	2	autum n 秋	
		M999X006	International Academic Exchange English 国际学术交流英语	2	spring 春	
		M13X118	data mining 数据挖掘	2	spring 春	
		M13X119	Advanced Software Engineering 高级软件工程	2	autum n 秋	
		M13X120	Cloud computing technology 云计算技术	2	spring 春	
		M13X121	modern cryptography 现代密码学	2	autum n 秋	
		M13X122	Theory and Methods of Knowledge Engineering 知识工程理论与方法	2	spring 春	
Make-up courses 补修课程	Undergraduate remedial courses 本科阶段补修课程	18133401	Structured Programming (C Language) 结构化程序设计(C语言)	0	spring 春	No less than 3 remedial courses for postgraduates with equivalent academic qualifications or cross majors (not included in the total credits) 同等学力身
		14133409	discrete mathematics 离散数学	0	spring 春	
		14134801	Data structure and algorithm 数据结构及算法	0	autum n 秋	
		17133409	Operating system principle 操作系统原理	0	spring 春	
		17133408	Principles of Computer Composition 计算机组成原理	0	spring 春	



Course category		Course code	Course title	credit	semes ter	note
		10134045	Compilation principle 编译原理	0	spring 春	份或跨专业 研究生补修 不少于 3 门 (不计入 总学分)
		10133041	Database principle 数据库原理	0	spring 春	
		10134904	computer network 计算机网络	0	spring 春	
academic activities 学术活动				2	Compulsory (It is required to participate in 8 academic activities and give two lectures)	
Experiment Practice 实验实践环节				2	4 credits for entering the enterprise graduate workstation and passing the examination	
Reward credits for innovation and entrepreneurship				2		

d. Control Science and Engineering (Master)

Course category		Course code	Course title	credit	semester	note
Degree courses 学位课程	Basic Courses 学科基础课	M999X008	Matrix theory 矩阵论	3	autumn 秋	
		M13X006	Optimization Theory and Algorithm 最优化理论与算法	3	autumn 秋	
		M13X151	modern control theory 现代控制理论	3	autumn 秋	
	Professional basic courses 专业基础课	M13X008	Intelligent Control Theory and Technology 智能控制理论与技术	3	spring 春	
		M13X152	Optimal control and state estimation 最优控制与状态估计	3	autumn 秋	
Non-degree course	Public Elective Courses 公共选修课	M999X016	Research Ethics and Academic Norms 科研伦理与学术规范	2	Spring, autumn 春秋	Compulsory 必修
		M999X017	How to Write Scientific Research Papers 如何写好科研论文	1	Spring, autumn 春秋	



学位课程	Professional Elective Courses 专业选修课	M13X156	Neural Network and Deep Learning 神经网络与深度学习	3	autumn 秋	1. Elective courses for at least 9 credits (interdisciplinary courses for at least 2 credits) 2. "*" is an interdisciplinary course 1.至少选修 9 学分 (跨学科课程至少 2 学分) 2.“*”为跨学科课程
		M13X010	pattern recognition 模式识别	3	autumn 秋	
		M13X011	adaptive control 自适应控制	3	spring 春	
		M13X002	Modern Digital Signal Processing 现代数字信号处理	3	autumn 秋	
		M13X035	Artificial intelligence* 人工智能*	3	spring 春	
		M13X153	System Modeling and Simulation Technology 系统建模与仿真技术	3	spring 春	
		M13X039	computer control system 计算机控制系统	3	autumn 秋	
		M13X005	digital image processing 数字图像处理	3	spring 春	
		M13X043	Nonlinear system theory 非线性系统理论	3	spring 春	
		M13X044	Modern Power Electronics Technology 现代电力电子技术	3	autumn 秋	
		M13X046	Intelligent control seminar (special research) 智能控制讨论班(专题研究)	3	autumn 秋	
		M13X048	Modeling and control of power electronic system 电力电子系统建模及控制	3	spring 春	
		M13X050	Modern detection technology 现代检测技术	2	spring 春	
		M13X154	Academic Paper Writing 学术论文写作	1	autumn 秋	
		M13X155	Robot Control Technology 机器人控制技术	3	autumn 秋	
		M999X006	English for international academic exchange* 国际学术交流英语*	2	spring 春	
Make-	Undergraduate remedial courses	21133202	International Academic Exchange English 数字电子技术基础	0	spring 春	credits no counted



up Cou rse s 补 修 课 程	本科阶段 补修课程	10134010	Microcomputer Principle 微机原理	0	spring 春	
		17144019	Automatic control principle (classical part 自 动控制原理（经典部分	0	spring 春	
academic activities 学术活动				2	Compulsory 必修	
Experiment Practice 实验实践环节				4	Compulsory 必修	
Reward credits for innovation and entrepreneurship 创新创业奖励学分				2		

e. Electronics and Communication (Master)

Course category	Course code	Course title	credit	semester	note
Degree courses 学位课程	M999X008	Matrix theory 矩阵论	3	autumn 秋	Professional basic courses 1-11 Direction Compulsory 专业基础课 1-11 方向必修
	M13X013	Communication Theory and System 通信理论与系统	3	autumn 秋	Professional basic courses 1-4 Direction Compulsory 专业基础课 1-4 方向必修
	M13X157	Modern signal processing technology 现代信号处理技术	3	autumn 秋	
	M13X158	Parallel processing and architecture 并行处理与体系结构	3	autumn 秋	Professional basic courses 5-8Direction Compulsory 专业基础课 5-8 方向必修
	M13X014	machine learning 机器学习	3	autumn 秋	



	M13X007	Linear system theory 线性系统理论	3	autumn 秋	Professional basic courses 9-11 Direction Compulsory 专业基础课 9-11 方向必修
	M13X155	Robot Control Technology 机器人控制技术	3	autumn 秋	
	M09Z060	Fundamentals of Semiconductor Devices 半导体器件基础	3	autumn 秋	Professional basic courses 12-15 compulsory courses (9 credits required) 专业基础课 12-15 方向必修 (必选 9 学分)
	M09Z061	Calculation method and engineering application 计算方法及工程应用	3	autumn 秋	
	M09Z062	Photonics 光子学	3	1 秋	
	M09Z063	Solid State Electronics 固态电子学	3	spring 春	
Elective Courses 选修课程	M999X016	Research Ethics and Academic Norms 科研伦理与学术规范	2	Spring, autumn 春秋	Compulsory 必修
	M999X017	How to Write Scientific Research Papers 如何写好科研论文	1	Spring, autumn 春秋	
	M13Z054	Information Theory and Coding 信息论与编码	2	spring 春	At least 11 credits for elective courses (Direction 1-8 professional elective courses) 至少选修 11 学分 (方向 1-8 专业选修课)
	M13X001	random process 随机过程	3	autumn 秋	
	M13X099	Modern Digital Image Processing 现代数字图像处理	3	autumn 秋	
	M13X008	Intelligent Control Theory and Technology 智能控制理论与技术	3	spring 春	
	M13Z162	Neural Network and Deep Learning 神经网络与深度学习	2	autumn 秋	
	M13Z032	FPGA and CPLD Application Technology FPGA 与 CPLD 应用技术	2	spring 春	
	M13Z045	Image analysis and understanding 图像分析与理解	2	spring 春	
	M13X022	Video signal processing 视频信号处理	2	spring 春	



	M13Z167	Signal detection and estimation 信号检测与估计	2	spring 春
	M13X026	mobile communication 移动通信	2	spring 春
	M13Z168	System Design Method and Practice 系统设计方法与实践	2	spring 秋
	M13Z047	Wireless sensor network 无线传感网络	2	spring 春
	M13Z048	Modern detection technology 现代检测技术	2	spring 春
	M13Z056	Adaptive signal processing 自适应信号处理	2	spring 春
	M13X104	Data Science and Engineering 数据科学与工程	2	autumn 秋
	M13X102	Advanced Algorithm Design and Analysis 高级算法设计与分析	2	autumn 秋
	M13X130	Software architecture 软件体系结构	2	spring 春
	M13X135	Software Engineering Management 软件工程管理	2	spring 春
	M13Z169	Fundamentals of Software Engineering Theory 软件工程理论基础	2	spring 春
	M13X131	Software Development Methodology 软件开发方法学	2	spring 春
	M13X116	Algorithm Game Theory and Mechanism Design* 算法博弈论与机制设计*	2	autumn 秋
	M13X117	Optimization Theory and Algorithm* 最优化理论与算法*	2	autumn 秋
	M13Z170	Large scale domain software system 大规模领域软件系统	2	spring 春
	M13Z171	Advanced Distributed System 高级distributed system 分布式系统	2	spring 春
	M13Z172	Advanced AI 高级人工智能	2	spring 春
	M13X121	modern cryptography 现代密码学	2	1 秋
	M13X133	software security 软件安全	2	spring 春
	M13X118	data mining 数据挖掘	2	spring 春



	M13X114	New Software Theory and Technology 软件新理论与新技术	2	spring 春	
	M13X106	Theory and Model of Computer Programming 计算机程序设计理论与模型	2	spring 春	
	M13X103	Advanced Computer Network 高级计算机网络	2	spring 春	
	M13Z173	Software Systems and Engineering 软件系统与工程	2	autumn 秋	
	M13Z174	Basic software and open source system 基础软件与开源系统	2	spring 春	
	M13X119	Advanced Software Engineering 高级软件工程	2	autumn 秋	
	M13X122	Theory and Methods of Knowledge Engineering 知识工程理论与方法	2	spring 春	
	M13X105	Discipline frontier and practice 学科前沿与实践	1	autumn 秋	
	M13X136	Software analysis and testing 软件分析与测试	2	spring 春	
	M13X137	Software Data Analysis Technology 软件数据分析技术	2	spring 春	
	M13X138	Software Requirements Engineering 软件需求工程	2	spring 春	
	M13X111	Network and Information Security 网络与信息安全	2	spring 春	
	M13X117	Optimization Theory and Algorithm* 最优化理论与算法*	2	autumn 秋	At least 11 credits for elective courses (Direction 9-11 professional elective courses) 至少选修 11 学分 (方向 9-11 专业选修课)
	M13X008	Intelligent Control Theory and Technology 智能控制理论与技术	3	spring 春	
	M13X011	adaptive control 自适应控制	3	spring 春	
	M13Z172	Advanced AI 高级人工智能	2	spring 春	
	M13Z162	Neural Network and Deep Learning 神经网络与深度学习	2	autumn 秋	
	M13Z037	pattern recognition 模式识别	2	autumn 秋	
	M13Z163	System Modeling and Simulation Technology	2	spring 春	



		系统建模与仿真技术			
	M13X118	data mining 数据挖掘	2	spring 春	
	M13Z060	computer control system 计算机控制系统	2	autumn 秋	
	M13Z065	Modern Power Electronics Technology 现代 电力电子技术	2	autumn 秋	
	M13Z058	Modeling and control of power electronic system 电力电子系统建模及控制	2	spring 春	
	M09Z064	Physical properties of crystals 晶体物性	2	spring 春	At least 11 credits for elective courses (Direction 12-15 professional elective courses) 至少选修 11 学 分 (方向 12-15 专 业选修课)
	M09Z065	Progress in optoelectronic materials and devices 光电子材料与器件进展	3	autumn 秋	
	M09Z066	Modern Photoelectric Sensing Principle and Technology 现代光电传感原理与技术	3	spring 春	
	M09Z067	nonlinear optics 非线性光学	3	spring 春	
	M09Z069	Spectroscopy 光谱学	2	autumn 秋	
	M09Z070	Thin-film physics 薄膜物理	2	spring 春	
	M09Z071	New energy testing technology 新能源测试 技术	2	spring 春	
	M09Z072	Solid state lighting 固态照明	2	autumn 秋	
	M09Z073	Information optics 信息光学	2	spring 春	
	M09Z075	Optoelectronics 光电子学	2	autumn 秋	
	M09Z082	Optical system CAD 光学系统 CAD	2	autumn 秋	
	M999X018	English Scientific Paper Writing and Academic Reports 英文科技论文写作与学 术报告	2	autumn 秋	
	M999X021	Social innovation and entrepreneurship 社会 创新与创业	1	autumn 秋	
	M999X022	English Grammar and Writing Style 英语语法和写作风格	0.5	autumn 秋	
	M999X024	Information literacy - a required course of academic research	2	autumn 秋	



		信息素养-学术研究的必修课			
	M999X006	International Academic Exchange English 国际学术交流英语	2	spring 春	
practice	M13Z148	Practice in Enterprises and Public Institutions 企事业生产单位实习	4	Spring,aut um 春秋 春秋	
	M13Z149	Research and development work 研究开发工 作	4	Spring,aut um 春秋 春秋	