

信息与计算科学专业2024级本科人才培养方案

一、专业基本信息

学科门类：	理学	专业代码：	070102
授予学位：	理学学士	标准学制：	4年
毕业学分要求：	167学分		

二、培养目标与毕业要求

1. 培养目标

本专业秉承“厚基础、宽口径、重交叉、强创新”的理念，着力培养具有坚实的数学基础、缜密的数学思维、熟练的算法设计和数据分析技能的理工交叉创新型人才。通过系统专业知识传授和科学研究训练，激发学生创新意识，使其具有严谨的科学素养、优秀的工程计算能力，能解决人工智能、大数据、金融、计算机及工程等领域的实际问题，可从事算法与数据分析、软件开发、及数学教育等职业，成为既有深厚家国情怀和强烈社会责任感，又能满足国家发展和社会需求、德智体美劳全面发展的社会主义建设者和接班人。

本专业毕业生具有如下目标预测：

- （1）具有良好的思想道德素质、文化素质、心理素质和身体素质，具有良好的职业能力、职业素养及可持续发展能力；
- （2）具备严格的科学思维能力、较强的理论创新能力、实践创造能力以及创业专业能力；能独立进行科学研究和主导大型项目研发，在所研究和从事领域具备一定的影响力；
- （3）具备熟练的编程技巧以及大型项目研发和管理经验，在国内外知名IT公司担任项目主管或研发主管等中层职务，或能在中小企业担任领导层职务；
- （4）具有自主学习和适应发展的能力、具备优秀的团队合作和管理能力、并对主流技术、主流方法以及主流思想具有敏锐的追踪能力。

2. 毕业要求

通过本专业的学习，学生具有良好的科学人文素养、高度的社会责任感和积极的科学研究探索精神。熟练掌握数学与自然科学、信息与科学计算以及计算机相关专业基础知识，以及与本专业相关的人工智能、大数据分析、经济金融和生物信息等学科交叉知识。了解自然环境、社会环境和个人成长可持续发展的内涵和意义。能够运用数学思维，应用计算机解决实际工程计算问题，具备较强的设计开发技能。掌握本专业相关的国际发展动态，拥有国际化视野和家国情怀。具有较强的团队协作、项目管理和终身学习能力来应对个人或职业发展的需求。

毕业能力要求	指标点
毕业要求1： 立德树人	1-1. 具有人文科学素养、家国情怀和使命担当
	1-2. 遵纪守法，能够在实践中理解并遵守职业道德和规范，履行责任
	1-3. 具有科学的人生观、世界观、价值观
毕业要求2： 专业基础知识	2-1. 具有扎实的数学与自然科学的基础知识
	2-2. 具有信息与科学计算的基础知识
	2-3. 具有计算机的基础知识

**Information and Computing Science Major 2024 Undergraduate Curriculum Major 2024
Undergraduate Curriculum**

I 、 Basic Information

Discipline:	Science	Major Code :	70102
Degrees Conferred:	Bachelor of Science	Duration:	4 years
Requirements for Graduation Credits:	167credit		

II 、 Educational Objectives and Requirements

1. Educational Objectives

The major of information and computing science adheres to the concept of "thickened foundation, widen caliber, heighten interdisciplinary and enhance innovation". The purpose of training is to cultivate interdisciplinary talents with solid mathematical foundations, meticulous mathematical thinking, proficient algorithm design and data analysis skills. Through systematic professional knowledge teaching and scientific research training, innovative awareness of students are stimulated. They will possess rigorous scientific literacy, excellent engineering computing abilities, and the ability to solve practical problems in fields such as artificial intelligence, big data, finance, computer science, and engineering. Students can engage in professions such as algorithm and data analysis, software development, and mathematics education in the future, becoming socialist builders and successors who not only have a strong sense of patriotism and social responsibility, but also meet the needs of national development and society, and have comprehensive development in morality, intelligence, physical fitness, aesthetics, and labor.

Graduates should obtain knowledge and competences as follows:

- (1) Students will have good ideological and moral quality, cultural quality, psychological quality and physical quality. They will have good professional ability, professional quality and sustainable development ability;
 - (2) Students will have strict scientific thinking ability, strong theoretical innovation ability, practical innovation ability and entrepreneurial professional ability. They can carry out scientific research independently and lead research and development in large project. That They have certain influence in the field of research and engagement;
 - (3) Students will be proficient in programming and has experience in research and development of large projects. They will hold middle-level positions such as project director or research and development director in well-known domestic and foreign IT companies. They can hold leadership positions in small and medium-sized enterprises;
 - (4) Students will have the ability of independent learning and adaptive development, excellent teamwork and management ability. They have a keen ability to track mainstream technology, mainstream methods and mainstream ideas.
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2. Graduation Requirements

Graduates should obtain knowledge and competences as follows: Through the study of this major, students have a good scientific and humanistic quality, a high sense of social responsibility and a positive spirit of scientific research and exploration. Students can master the basic knowledge of mathematics and natural science, information and scientific computing and computer related disciplines, as well as the interdisciplinary knowledge of artificial intelligence, big data analysis, economic finance and biological information related to this major. Meanwhile, they can understand the connotation and significance of the sustainable development of natural environment, social environment and personal growth. Students can use mathematical thoughts and computer skills to solve practical engineering calculation problems. Additionally, they have strong design and development skills, master the relevant international development trends of the major, and have international vision and feelings of home and country. They have abilities of teamwork, project management and lifelong learning to meet the personal and professional needs.

Graduation Requirements	Indices
Requirement 1: Scientific and humanistic quality	1-1. Have the quality of humanities, the feelings of home and country, and the responsibility of mission
	1-2. Abide by laws and disciplines, understand and abide by professional ethics and norms in practice, and fulfill responsibilities
	1-3. Have a scientific outlook on life, the world and values
Requirement 2: Professional knowledge	2-1. Possess solid knowledge of mathematics and science
	2-2. Possess basic knowledge of information and scientific computing
	2-3. Possess basic knowledge of computer
Requirement 3: Interdisciplinary	3-1. Possess knowledge of mathematics and computers applying in the field of artificial intelligence
	3-2. Possess knowledge of mathematics and computers applying in the field of big data
	3-3. Possess knowledge of mathematics and computers applying in the field of economy and finance
	3-4. Possess knowledge of mathematics and computers applying in the field of bioinformatics
Requirement 4: Design and development skills	4-1. Be able to analyze and design algorithms with mathematical and computer knowledge
	4-2. Be able to develop software with advanced computer language
Requirement 5: Scientific research	5-1. Focus on the discipline frontier in information science, computational mathematics and operational research control theory, technology and application
	5-2. Have the scientific consciousness of applying mathematics knowledge to research practical problems

	5-3. Have the spirit of knowledge updating, technology tracking, technology retrieval and scientific research innovation
Requirement 6: Engineering calculation	6-1. Be able to use modern mathematical software to solve practical engineering problems
	6-2. Be able to use machine learning and other methods to optimize engineering calculation
Requirement 7: Social responsibility	7-1. Be able to evaluate the impact of the major on society, law and culture, and understand the responsibilities
	7-2. Have the awareness of information security, network morality and confidentiality with citizenship and sense of ownership
	7-3. Have the sense of citizenship and ownership
Requirement 8: Sustainable development	8-1. Possess knowledge of sustainable development of natural environment
	8-2. Possess knowledge of sustainable development of social environment
	8-3. Possess knowledge of sustainable development of personal growth
Requirement 9: Teamwork	9-1. Have team adaptability
	9-2. Have teamwork ability
	9-3. Have team leadership
Requirement 10: International Perspective	10-1. Master one or more foreign languages and have strong listening, speaking, reading, writing and translation skills
	10-2. Have the ability to query, retrieve and read materials of this major in foreign language
	10-3. Have the ability to communicate effectively in foreign languages in the field of information and Computing Science
Requirement 11: Project management	11-1. Have the ability to manage quality in information and computing science and related fields
	11-2. Have the ability to analyze decision in information and computing science and related fields
	11-3. Have the ability to apply management principles and decision analysis methods to projects
Requirement 12: Lifelong learning	12-1. Have the ability to learn independently and adapt to development
	12-2. Strong physical fitness, willpower to endure hardship and hard work
	12-3. Strong physical fitness, willpower to endure hardship and hard work

III、 Main Disciplines and Related Majors

Main Disciplines: Mathematics、Computer Science and Technology

Related Majors: Mathematics and Applied Mathematics, Artificial Intelligence and Big Data

IV、Core Courses

is Research and Optimization; Complex Functions and Integral Transforms; Database

V、Practical Teaching Session

1、Separate Practice (Experiment, Programming and Practice) :

Total Credits: 23.5; Total Hours: 752.

2、Intensive Practice

No.	Course Name	Weeks	Credit	Training Mode
(1)	Military Skill Training	3	2.0	Schools
(2)	Python Programming	16	2.0	Schools
(3)	Fundamentals of C Programming	16	2.0	Schools
(4)	Mathematical Experiment	2	1.0	Schools
(5)	Mathematical Modeling Practice	1	1.0	Schools
(6)	Course Design of Advanced Language	2	1.0	Schools and Enterprises (Society)
(7)	Intelligent Optimization Method	2	1.5	Schools
(8)	Database Application Development	2	1.5	Schools
(9)	Professional Practice	3	1.0	Schools and Enterprises (Society)
(10)	Graduation Design(Thesis)	16	8.0	Schools and Enterprises (Society)
Total			21.0	-

Practice Credits Proportion: 26.6 %

3、Calculation Method :(Separate practice credits + Intensive practice credits)/ Total credits of this major

VI、Short Semester Arrangement

No.	Course Name	Credit	Short Semester Hour Distribution			
			Short Semester 1	Short Semester 2	Short Semester3	
1	Military Skill Training	2.0	3 weeks			

2	Mathematical Experiment	1.0		2weeks		Alternate rotation
3	Database Application Development	1.5		2weeks		Alternate rotation
4	Mathematical Modeling Practice	1.0		1weeks		Alternate rotation
5	Intelligent Optimization Method	1.5			2weeks	Alternate rotation
6	Course Design of Advanced Language	1.0			2weeks	Alternate rotation
7	Professional Practice	1.0			3weeks	Alternate rotation
Total		9.0	36	88	88	

VII、Credit Distribution

Credits and Proportion	Credits	Experiment and Practice Credits/Proportion	Optional Credits/Proportion
General Education	43/25.7%	9.1/21.2%	6/14.0%
Discipline Education	41/24.6%	3/7.3%	0/0%
Specialized Education	39/23.4%	21.5/55.12%	0/0%
Elective Courses for Expanding Abilities	44/26.3%	11/34.10%	44/26.3%
Total Credits/Proportion	167/100%	44.5/26.8%	50/29.9%

VIII、Micro major Programs and Requirements

Micro major: Quantum and Information

No.	Course Name	Credits/Hours	Weekly Hour Per Semester				Notes
			3	4	5	6	
1	Mathematical Model	2/32		4(1~8)			This micro major requires a strong foundation in mathematics and physics. It is recommended that students with scores above 85 in advanced mathematics, linear algebra, probability theory and mathematical statistics, and
2	Complex Network and Big Data Analysis	2.5/48				6(1~8)	
3	Wave and Modern Optics	4.0/64	4				
4	Atom and Quantum Physics	4.0/64			4		

毕业要求3: 学科交叉	3-1. 具有将数学和计算机应用于人工智能领域的知识
	3-2. 具有将数学和计算机应用于大数据分析领域的知识
	3-3. 具有将数学和计算机应用于经济、金融领域的知识
	3-4. 具有将数学和计算机应用于生物信息领域的知识
毕业要求4: 设计开发技能	4-1. 能使用数学和计算机知识分析和设计算法
	4-2. 能使用计算机高级语言开发软件
毕业要求5: 科学研究	5-1. 关注信息科学、计算数学或运筹控制理论、技术与应用等的前沿动态
	5-2. 具有应用数学知识研究实际问题的科学意识
	5-3 具备知识更新、技术跟踪、科技检索及科研创新精神
毕业要求6: 工程计算	6-1. 能使用现代数学软件计算工程实际问题
	6-2. 能使用机器学习等方法优化工程计算
毕业要求7: 社会 责任感	7-1. 能评价本专业对社会、法律以及文化的影响, 并理解应承担的责任
	7-2. 具有信息安全意识和良好的网络道德感及保密意识
	7-3 具有公民感和主人翁意识
毕业要求8: 可持续发展	8-1. 了解自然环境可持续发展的知识
	8-2. 了解社会环境可持续发展的知识
	8-3. 了解个人成长可持续发展的知识
毕业要求9: 团队协作	9-1. 具有团队适应能力
	9-2. 具有团队成员协作能力
	9-3. 具有团队领导能力
毕业要求10: 国际视野	10-1. 掌握一门及以上外语, 具有较强听、说、读写、译能力
	10-2. 具备使用外语熟练查询、检索、阅读本专业外文资料的能力
	10-3 具备使用外语就信息与计算科学领域进行高效沟通和交流的能力
毕业要求11: 项目管理	11-1. 具备信息与计算科学及相关领域质量管理的能力
	11-2. 具备信息与计算科学及相关领域决策分析的能力
	11-3. 具备将管理原理和决策分析方法应用到项目中的能力

毕业要求12: 终身学习	12-1. 具有自主学习和适应发展的能力
	12-2. 具有较强的身体素质和吃苦耐劳的意志力
	12-3. 具有较强的身体素质和吃苦耐劳的意志力

三、主干学科与相近专业

主干学科：数学、计算机科学与技术

相近专业：数学与应用数学、人工智能与大数据

四、专业核心课程

7门专业核心课程群

微分方程 离散数学 运筹与优化 多元函数与积分 数据库技术 数值分析 多元统计分析

五、实践教学环节

1、 分散性实践（实验、上机、实践）：总学分 23.5 ；总学时： 752 。

2、 集中性实践环节

序号	课程名称	周数	学分	培养模式
(1)	军事技能训练 Military Skill Training	3	2.0	学校
(2)	Python程序设计(Python Programming)	16	2.0	学校
(3)	程序设计基础C(Fundamentals of C Programming)	16	2.0	学校
(4)	数学实验(Mathematical Experiment)	2	1.0	学校
(5)	数学建模实践(Mathematical Modeling Practice)	1	1.0	学校
(6)	高级语言课程设计(Course Design of Advanced Language)	2	1.0	学校+企业（社会）
(7)	智能优化方法(Intelligent Optimization)	2	1.5	学校
(8)	数据库应用开发(Database Application Development)	2	1.5	学校
(9)	专业实习(Professional Practice)	3	1.0	学校+企业（社会）
(10)	毕业设计(论文) (Graduation Design(Thesis))	16	8.0	学校+企业（社会）
合计			21.0	-

3、 实践学分比例： 26.6 % （保留到小数点后一位）
计算方法：（分散性实践学分+集中性实践环节学分）/本专业总学分

六、短学期安排

序号	课程名称	学分	各短学期学时分配			
			短学期1	短学期2	短学期3	
1	军事技能训练	2.0	3周			
2	数学实验	1.0		2周		交替轮换进行
3	数据库应用开发	1.5		2周		交替轮换进行
4	数学建模实践	1.0		2周		交替轮换进行
5	智能优化方法	1.5			2周	交替轮换进行
6	高级语言课程设计	1.0			2周	交替轮换进行
7	专业实习	1.0			3周	交替轮换进行
合计		9.0	36	88	88	

七、学分分布

学分及比例	学分	其中实验实践学分/比例	其中选修学分/比例
通识教育课程	43/25.7%	9.1/5.4%	6/3.6%
学科平台课程	41/24.6%	3/1.8%	0/0%
专业必修课程	39/23.4%	21.5/12.9%	0/0%
能力拓展选修课程	44/26.3%	11/6.7%	44/26.3%
总学分/比例	167/100%	44.5/26.6%	50/29.9%

八、微专业计划及要求

微专业名称：量子与信息

课程序号	课程名称	学分/学时	各学期周学时分配				备注
			三	四	五	六	
1	数学建模	2/32		4(1~8)			该微专业需要有较强的数理基础，建议高等数学、线性代数、概率论与数理统计、大学物理成绩均在85分以上的学生选修。
2	复杂网络与大数据分析	2.5/48				6(1~8)	
3	波动与近代光学	4.0/64	4				
4	原子与量子物理	4.0/64			4		

微专业课程为核心课不多于5门，学分控制为10-15学分。

IX、主要课程与毕业能力要求关系矩阵图(相关性强H, 相关性中M, 相关性弱L)

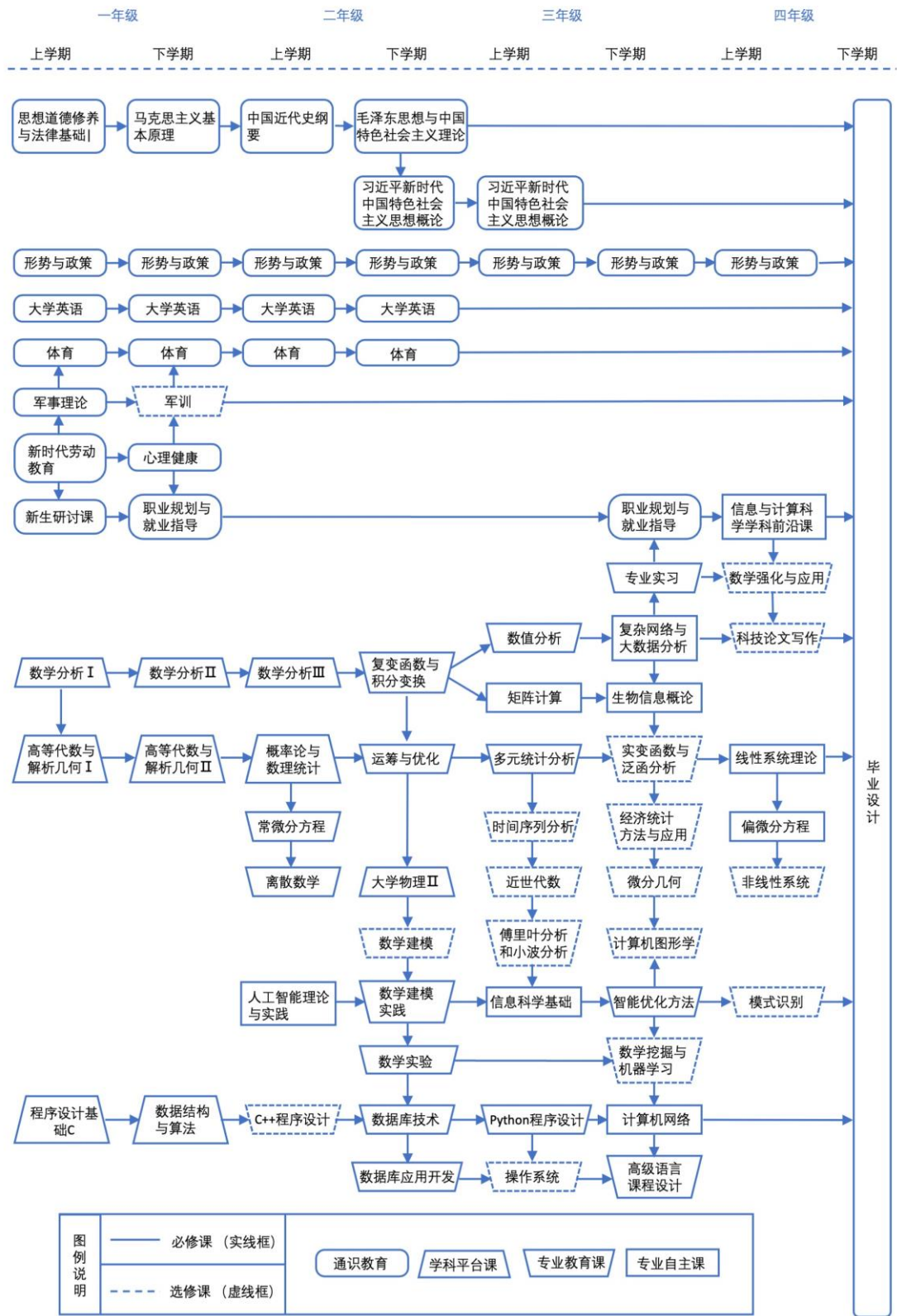
IX、 Correlation Matrix between Key Courses and Graduation Requirements (High Correlation—H, Medium Correlation—M, Low Correlation—L)（每项毕业要求指标点都有3-6门课程支撑（至少一门课对该指标点是H），每门课能支撑3-6个指标点（至少对一个指标点是H）

能力 (Requirements)	毕业能力1 Requirement 1			毕业能力2 Requirement 2			毕业能力3 Requirement 3				毕业能力4 Requirement 4		毕业能力5 Requirement 5			毕业能力6 Requirement 6			毕业能力7 Requirement 7			毕业能力8 Requirement 8			毕业能力9 Requirement 9			毕业能力10 Requirement 10			毕业能力11 Requirement 11			毕业能力12 Requirement 12			
	1.1	1.2	1.3	2.1	2.2	2	3.1	3.2	3.3	3.4	4.1	4.2	5.1	5.2	5	6.1	6.2	6	7.1	7.2	7	8.1	8.2	8	9.1	9.2	9	10	10	10	11	11	11	12	12	12.3	
课程(Courses)																																					
数学分析I(Mathematical Analysis I)				M			H							H		M	M																				
数学分析II(Mathematical Analysis II)				M			H							H		M	M																				
数学分析III(Mathematical Analysis III)				M			H							H		M	M																				
高等代数与解析几何I(Advanced Algebra and Analytic Geometry I)				M			M		H					M								H															
高等代数与解析几何II(Advanced Algebra and Analytic Geometry II)				M			M		H					M								H															
数据结构与算法(Data Structures and Algorithms)			M		M			M						M									H														
概率论与数理统计(Probability and Mathematical Statistics)				M					H					H			M					H															
大学物理III(College Physics III)					M									M								M															
程序设计基础C(Fundamentals of C Programming)					M	H					M												M						H								
离散数学(Discrete Mathematics)						H				M											M	M	M														
常微分方程(Ordinary Differential Equations)							M										H	M																M			
复变函数与积分变换(Complex Functions and Integral Transforms)			M	H										M																				M			
运筹与优化 (Operations Research and Optimization)			M						M								H			M													L				

能力 (Requirements) 课程(Courses)	毕业能力1 Requirement 1			毕业能力2 Requirement 2			毕业能力3 Requirement 3				毕业能力4 Requirement 4		毕业能力5 Requirement 5			毕业能力6 Requirement 6			毕业能力7 Requirement 7			毕业能力8 Requirement 8			毕业能力9 Requirement 9			毕业能力10 Requirement 10			毕业能力11 Requirement 11			毕业能力12 Requirement 12		
	1.1	1.2	1.3	2.1	2.2	2	3.1	3.2	3.3	3.4	4.1	4.2	5.1	5.2	5	6.1	6.2	6	7.1	7.2	7	8.1	8.2	8	9.1	9.2	9	10	10	10	11	11	11	12	12	12.3
数据库技术(Database Technology)	H					M								M																						
数值分析(Numerical Analysis)					H					H			M																							
多元统计分析(Multivariate Statistical Analysis)	M	M			M			M					M						M						H											
C++程序设计(C++ Programmin)						H	M					M										H	M							M						
数学建模(Mathematical Modeling)					H															M						M				M						
傅里叶分析和小波分析(Fourier Analysis and Wavelet Analysis)				H			M								M					M																
近世代数(Abstract Algebra)				H	M								L	M																						
时间序列分析(Time Series Analysis)			M					M							H					M						M										
操作系统(Operating System)						H				M														H										L		
实变函数与泛函分析(Real Variable Function and Functional Analysis)	M	M							M					M		H																				
数据挖掘与机器学习(Data Mining and Machine Learning)								M																	M			H	H							
经济统计方法与应用(Economic Statistical Methods and Applications)				H					M					M						M	H															
微分几何(Differential Geometry)					H				M				M	H		M	M																			
计算机图形学(Computer Graphics)				M						M													H		M					H						
模式识别(Pattern Recognition)							M												M			M						H								

[illegible]

X 课程体系配置图 Curriculum System Configuration Diagram



信息与计算科学专业教学进程表
Table of Teaching Schedule for Information and Computing Science Major

课程类别 Course Type	课程性质 Course Nature		序号No.	课程名称 Course Name	学 分 Credits	总学时 数 Total Credit Hours	学时分配 Credit Hour Distribution				各学期周学时分配 Weekly Hours Per Semester								课程考试 学期 Examination Semester	开课学 院 School	备 注 Notes		
							讲 课 Lecture		实 验 Experiment	上 机 Program -ming	实 践 Practice	一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th				八 8th	
							线下课时 offline	线上课时 online															
通识教育课程 General Education	通识教育必修课 General Education (Compulsory)	思政类 Ideological and Political Courses	1	思想道德与法治 Cultivation of Ideological Morality and Basis of Law	3.0	48	48					3								26			
			2	中国近现代史纲要 Outline of Chinese Contemporary and Modern History	3.0	48	48						3							26			
			3	马克思主义基本原理 Elementary Theory of Marxism	3.0	48	48							3						26			
			4	毛泽东思想和中国特色社会主义理论体系概论 Mao Zedong Thought and Theory of Socialism with Chinese Characteristics	3.0	64	32					32				3					26	思想政治理论实践环节（2.0学分）	
			5	习近平新时代中国特色社会主义思想概论Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	3.0	64	32					32					3				26		
			6	形势与政策 Current Situation and Policies	2.0	64	16					48	1	1	1	1	1	1	1		26	第1-2学期开设，第3-8学期采用备案制（Semester 1-2）	
			7	国家安全教育 National Security Education for College Students	1.0	16	2	12				2	2								97		
	外语类 Foreign Language Courses	8	大学英语 College English	8.0	160	128	32					2	2	2	2					1234	12		
		军体类 Military Courses	9	军事理论 Military Theory	2.0	36	32				4	2								97			
			10	军事技能训练 Military Skill Training	2.0	3周 (Three weeks)					3周(Three weeks)		3周(Three weeks)								97	短学期1 (Short semester 1)	
			11	体育 Physical Education	4.0	144	16				128	2	2	2	2						14	实践中含课外体育理论考试16学时In practice, 16 credit hours of	
		成长规划类 Growth Planning Courses	12	新生研讨课 Freshman Seminar	1.0	16	16					2									13		
			13	职业规划与就业指导 Career Planning and Employment Guidance	0.5	16	16						2				2				97		
			14	心理健康 Mental Health	0.5	16	16						2								97		
			15	新时代劳动教育 Labor Education in the New Era	1.0	16	4	12					2										
	小计 Subtotal				37.0	756.0	454.0	56.0	0.0	0.0	246.0	16.0	12.0	8.0	8.0	4.0	3.0	1.0	1.0				
	通识教育选修课 General Education (Optional)		分为科学精神、创新创业、四史文化、心理健康、艺体审美、计算机和非技术能力课程类7个模块，每个模块最多选修2.0学分（其中四史文化类、心理健康类、艺体审美类需选修不少于1.0学分），每学期最多选修2门课程，共修满6.0学分。																				
			小计 Subtotal				6.0																
	合计 Total					43.0																	

课程类别 Course Type	课程性质 Course Nature	序号No.	课程名称 Course Name	学 分 Credits	总学时 数 Total Credit Hours	学时分配 Credit Hour Distribution				各学期周学时分配 Weekly Hours Per Semester								课程考试 学期 Examination Semester	开课学 院 School	备 注 Notes		
						讲 课 Lecture		实 验 Experiment	上 机 Program -ming	实 践 Practice	一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th				八 8th	
						线下课时 offline	线上课时 online															
学科平台课程 Discipline Education	学科基础课程 Basic Courses	16	数学分析I(Mathematical Analysis I)	6.0	96	96					6							1	13			
		17	数学分析II(Mathematical Analysis II)	6.0	96	96						6						2	13			
		18	数学分析III(Mathematical Analysis III)	3.0	48	48							6					3	13	8周结束		
		19	高等代数与解析几何I(Advanced Algebra and Analytic Geometry I)	6.0	96	96					6							1	13			
		20	高等代数与解析几何II(Advanced Algebra and Analytic Geometry II)	6.0	96	96						6						2	13			
		21	数据结构与算法(Data Structures and Algorithms)	3.5	64	48				16			4					2	13			
		22	概率论与数理统计(Probability and Mathematical Statistics)	3.5	64	48					16			4				3	13			
		23	大学物理II(College Physics II)	5.0	80	80								5				4	13			
		小计 Subtotal	39.0	640	608				16	16	12	16	10	5	0	0	0					
	集中性实践环节 Intensive Practice Sessions	24	程序设计基础C(Fundamentals of C Programming)	2.0	64					32	32	4							1	13		
		小计 Subtotal	2.0	64					32	32	4											
		合计 Total	41.0	704	608				64	48	16	16	10									
专业必修课程 Specialized Education	专业核心课程 Core Courses	25	离散数学(Discrete Mathematics)	3.5	64	48				16			4					3	13			
		26	常微分方程(Ordinary Differential Equations)	2.5	48	32				16			6					3	13	8周结束		
		27	复变函数与积分变换(Complex Functions and Integral Transforms)	3.5	64	48					16				4			4	13			
		28	运筹与优化(Operations Research and Optimization)	3.5	64	48					16				4			4	13			
		29	数据库技术(Database Technology)	3.0	64	32				32					4			4	13			
		30	数值分析(Numerical Analysis)	3.5	64	32	16			16						4		5	13			
		31	多元统计分析(Multivariate Statistical Analysis)	2.5	48	32					16					6		5	13	8周结束		
			小计 Subtotal	22.0	416	304	16			48	96			10	9	10						
	集中性实践环节 Intensive Practice Sessions	32	数学实验(Mathematical Experiment)	1.0	32					32					16				13	短学期2(2周)		
		33	数学建模实践(Mathematical Modeling Practice)	1.0	32					32					16				13	短学期2(2周)		
		34	数据库应用开发(Database Application Development)	1.5	48					48					24				13	短学期2(2周)		
		35	Python程序设计(Python Programming)	2.0	64					16	48					4				13		
		36	高级语言课程设计(Course Design of Advanced Language)	1.0	32					32							16			13	短学期3(2周)	
		37	智能优化方法(Intelligent Optimization Method)	1.5	48					48							24			13	短学期3(2周)	
		38	专业实习(Professional Practice)	1.0	32						32									13	短学期3(3周)	
		39	毕业设计（论文） Graduation Design（Thesis）	8	16周															13		
			小计 Subtotal	17.0	288					208	80				56	4	40					
	合计 Total	39.0	704.0	304.0	16.0			256.0	176.0				10.0	65.0	14.0	40.0						
专业选修课程 Specialized Elective Courses		40	C++程序设计 (C++ Programmin)	2.5	48	32				16				3					13			
		41	数学建模(Mathematical Modeling)	2.0	32	16	16								4				13	8周结束， 限选 Compulsory		
		42	傅里叶分析和小波分析(Fourier Analysis and Wavelet Analysis)	3.5	64	48				16						4				13		
		43	近世代数(Abstract Algebra)	3.0	48	48										6				13	8周结束	
		44	时间序列分析(Time Series Analysis)	2.5	48	32				16						6				13	8周结束	
		45	操作系统(Operating System)	2.5	48	32				16						6				13	8周结束	
		46	实变函数与泛函分析(Real Variable Function and Functional Analysis)	2.5	48	32					16						3		6	13		
		47	数据挖掘与机器学习(Data Mining and Machine Learning)	3.0	64	32				32							4			13		
		48	经济统计方法与应用(Economic Statistical Methods and Applications)	2.5	48	32				16							6			13	8周结束	
		49	微分几何(Differential Geometry)	2.5	48	32					16						3			13		
		50	计算机图形学(Computer Graphics)	3.0	64	32				32							4			13		
		51	模式识别(Pattern Recognition)	2.5	48	32				16								6		13	8周结束	
		52	科技论文写作(Scientific Paper Writing)	1.0	16	16												2		13	8周结束	
		53	数学强化与应用(Strengthening and Application of Mathematics)	3.0	64	32					32							4			13	

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