数学类

Mathematics

数学类培养方案包括专业类介绍、专业类培养特色、专业类培养面向、专业类教学计划。专业类分流后的课程设置详见各专业培养计划。专业培养方案包括专业名称、学制、培养目标、毕业要求、专业简介、专业特色、核心课程、特色课程、教学计划安排等内容。

专业类介绍

数学是研究客观世界中数量关系与空间形式的科学，通过逻辑推理、符号演算和科学计算认识世界。数学是自然界的语言，是自然科学与社会科学的基础，为其他学科提供思想、观念和研究方法。数学也是一种文化，在人类文明的进程中起到重要作用。在当今科技高速发展的时代，保持数学方面的领先地位是世界上主要发达国家的一项国家战略目标。

数学类下设三个专业：数学与应用数学、信息与计算科学和统计学。其中数学与应用数学、信息与计算科学两个专业入选国家级一流本科专业建设点。数学与应用数学专业是国家级特色专业、广东省名牌专业和重点专业。学院另开设数学类“强基计划”班。其所属学科拥有数学一级学科博士点和博士后科研流动站，且数学一级学科是广东省重点学科，建有国家工科数学基础课程教学基地和广东省数学技术实验教学示范中心。

学院现拥有数学与应用数学系、信息管理与系统科学系、统计与金融数学系、信息与计算科学系等 4 个教研机构，共有专任教师 90 人，拥有国家级领军人才、国家级青年人才、省级青年人才等高层次人才近 20 人次；开办有数学与应用数学、信息与计算科学、统计学等本科专业，开办有数学类“强基计划班”，数学与应用数学、信息与计算科学专业均入选国家一流本科专业建设点；建有国家级工科数学教学基地、广东省数学教学技术试验示范中心等教学实验平台；设有服务全校公共课教学的大学数学部；与宝洁、联通、国信等知名企业建立了多个学生实训基地。已形成本科－硕士－博士－博士后完整的人才培养体系。多年来数学类开展与美国、加拿大、英国、法国等国家的高水平大学多层次的联合培养项目。具有丰富的藏书和网络资源，其中拥有 105 平方米的图书资料室，共有图书 6667 册、其中英文黄皮书 1838 册，极大地满足了师生的学习工作需要。

专业类培养特色:

数学类培养家国情怀和全球视野兼备、“学习力、思想力、行动力”卓越、德智体美劳全面发展的“三创型”（创新、创造、创业）人才。数学类具有基础性强、应用面宽等特点。数学类培养的本

科生除了掌握较系统扎实的基本理论、基本技能和专业基础知识，还要对物理学、力学、计算机科学与技术、信息与通信工程、控制科学与工程、统计学、系统科学等有一定程度的了解。培养具有较强的数学思维能力、辩证意识、创新意识和实践能力；具有发现问题、提出问题以及利用数学技术、计算技术、信息技术和统计技术分析问题和解决问题的初步能力。

专业类培养面向:

学生在确认主修专业后，进入专业培养阶段。数学类共有三个专业教育培养通道，主要面向的专业有：数学与应用数学, 信息与计算科学, 统计学. 学院专门设有数学类“强基计划”班。

一、专业类课程学分登记表

课程类别	课程要求	学分	学时	备注
公共基础课	必修	20.5	384	
	通识	10	160	
专业基础课	必修	24	384	
集中实践教学环节	必修	4	4 周	
学分合计	58.5			

二、专业类课程设置表

类别	课程代码	课程名称	是否必修	学时数					学分数	开课学期
				总学时	理论	实验	实习	其它		
公共基础课	031101761	习近平新时代中国特色社会主义思想概论	必	48	36			12	3.0	1
	031101661	思想道德与法治	必	40	36			4	2.5	2
	044101383	学术英语（一）	必	32	32				2.0	1
	044102452	学术英语（二）	必	32	32				2.0	2
	084101181	人工智能导论（理工科类）	必	36	24	12			2.0	1
	052100332	体育（一）	必	36				36	1.0	1
	052100012	体育（二）	必	36				36	1.0	2
	006100112	军事理论	必	36	18			18	2.0	2
	045102811	Python 语言程序设计		40	32			8	2.0	2
	041100582	大学物理 I （一）	必	48	48				3.0	2
		人文科学领域、社会科学领域	通识课	128	128				8.0	
		科学技术领域		32	32				2.0	
	合 计		必	544	418	12		114	30.5	
专业基础课	040101591	解析几何	必	48	48				3.0	1
	040100111	高等代数（上）	必	80	80				5.0	1
	040100282	数学分析（一）	必	80	80				5.0	1
	040100931	高等代数（下）	必	80	80				5.0	2
	040100352	数学分析（二）	必	96	96				6.0	2
	合 计		必	384	384				24	
集中实践环节	006100151	军事技能	必	2 周					2.0	1
	040102661	数学专业导论	必	2 周					2.0	2
	合 计		必	4 周					4.0	

三、分流后教学计划

详见各专业培养计划。

数学与应用数学

Mathematics and Applied Mathematics

专业代码：070101　　学　制：4 年

培养目标：

坚持学校培养“品德优秀、基础宽厚、思维创新、能力卓越、专业精深”人才的总目标，培养具有社会主义核心价值观，德智体美劳全面发展，面向国家重大战略需求，适应社会发展和科技进步，掌握数学与应用数学领域扎实基础理论和宽广专业知识，具备数学建模、量化分析、人工智能等学科交叉能力，“三力”（学习力、思想力、行动力）卓越，“三创型”（创新、创造、创业）能力突出的数学与应用数学领域拔尖人才。

本专业的学生在毕业以后五年左右达到以下目标：

（1）积极应对国家重大战略需求，适应社会发展和科技进步，具备优秀的个人修养与职业道德，并拥有国际视野和领导才能。

（2）具备扎实的数学基础，掌握数学与应用数学的基本思想、基本理论与方法以及相关的计算机技术。

（3）具有出众的专门领域知识，能够在不同领域中开展基于数学与应用数学方法的基础和应用研究，展现出卓越的研究能力。

（4）能够胜任某一特定领域的专业技术工作，掌握该特定领域相关学科的精深知识，结合数学与应用数学的思想和方法，创新性地解决领域内的实际问题。

毕业要求：

1.专业知识与素养。掌握扎实的数学基础和专业知识，具有良好的数学思维和数学素养。

2.问题分析。能识别并规范表达数学及相关领域的复杂问题，结合文献研究与学科分析得出科学结论。

3.设计/开发解决方案。能针对数学及相关领域的复杂问题设计和开发解决方案，考量理论严密性、计算效率及可行性。

4.研究能力。能够基于数学和工程原理并采用科学方法对数学及相关领域的复杂问题进行研究，设计实验、分析数据并综合得出合理结论。

5.使用现代工具。能够针对数学及相关领域的复杂问题，开发、选择与使用恰当的技术、资源、现代工程和信息技术工具，对复杂问题进行预测与模拟，并能够理解其局限性。

6.科学与社会。能够基于数学专业相关背景知识进行合理分析，评价复杂科学和工程问题解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。

7.学科认知与发展　。理解学科发展规律，评估其对数学及相关领域的推动作用，把握前沿方向。

8.职业规范。具备人文社会科学素养和社会责任感，遵守学术伦理、法律及职业规范。

9.个人与团队。能在多学科团队中承担个体任务或负责人角色, 实现协作与协调。

10.沟通能力。能与同行及公众进行有效沟通和交流，具备跨文化交流能力。

11.终身学习。具备自主学习能力，适应学科发展并持续更新知识体系。

培养目标与毕业要求关系矩阵：

培养目标 / 毕业要求	培养目标 1	培养目标 2	培养目标 3	培养目标 4
专业知识与素养		•	•	•
问题分析		•	•	•
设计/开发解决方案		•	•	•
研究能力		•	•	•
使用现代工具			•	•
科学与社会	•		•	
学科认知与发展	•			•
职业规范	•	•		
个人与团队	•		•	
沟通能力	•	•	•	•
终身学习	•	•	•	•

专业简介：

数学与应用数学作为基础学科与应用学科的桥梁，社会价值广泛辐射：在科技创新领域，为人工智能、航空航天等前沿方向提供算法优化与数学建模支撑；在经济金融领域，构建风险评估模型与供应链优化方案，推动金融科技发展并辅助政策制定；在社会治理层面，借助传染病传播模型、智能交通网络算法等工具，精准提升公共卫生防控效能与城市管理效率，为生态保护提供量化科学依据；更以跨学科思维为桥梁，在生物医学、计算社会科学等领域激发创新突破，成为贯通理论研究与应用实践、破解复杂系统问题的核心动力。

华南理工大学数学学科始建于 1958 年，2013 年独立建院后，以人才培养与引进为双引擎，教学科研综合实力持续跃升，在国内外教育学术界影响力凸显。教育部第四轮学科评估中获 B+等级（全国并列第 19 位），第五轮评估延续优异表现。2019 年，学院入选教育部强基计划，数学与应用数

学专业同步获批国家一流本科专业建设点，并兼具国家级特色专业、广东省名牌专业与重点专业资质。学院师资力量雄厚，92 名专任教师中，集聚国家杰青、“万人计划”教学名师、优青、教育部新世纪人才等高层次人才近 20 人，中青年教师为中坚力量，队伍结构科学合理。国际化办学成果显著，与加拿大西安大略大学、英国伯明翰大学、爱丁堡大学、法国南特大学等海外高校开展本硕联合培养项目，助力学生拓展国际视野。

专业特色：

1.目标导向：聚焦创新型高水平人才培养，立足学科前沿，厚基础、重创新，推进科教融合。
2.交叉融合：探索“数学+”模式，强调与计算机、统计等技术融合，，赋能新工科及跨学科应用。
3.区域赋能：依托粤港澳大湾区优势，服务地方经济与国家战略，输送高素质人才助力创新发展。

授予学位：

理学学士学位

专业核心课程：

数学分析、高等代数、解析几何、常微分方程、实变函数、复变函数、抽象代数、数学物理方程、概率论、泛函分析、数学模型、神经网络与深度学习

特色课程：

新生研讨课：　数学专业导论、走进现代代数学与几何学

专题研讨课：　数学模型

双 语 课 程 ：　抽象代数、黎曼曲面与黎曼几何

全 英 课 程 ：　Statistics and regression with R, Statistical Learning and Data Science, The Qualitative Methods and Numerical Simulation for Differential Equations

学科前沿课：　微分方程思想方法选讲

跨学科课程：　Introduction to Statistical Learning and Data Science

本研共享课：　测度论、高等统计、量子信息与量子计算

创新实践课：　数学模型课程设计（“三个一”课程）

创业教育课：　数学模型课程设计（“三个一”课程）

竞教结合课：　数学模型、分析与代数选讲

劳动教育课：　数学技术实践

一、各类课程学分登记表

1.学分统计表

课程类别	课程要求	学分	学时	备注
公共基础课	必修	37	752	
	通识	10	160	
专业基础课	必修	65	1040	
选修课	选修	20	320	
合　计		132	2272	
集中实践教学环节	必修	22	29 周	
	选修	6	6 周	
毕业学分要求	132+28=160 （格式：合计学分+集中实践教学环节学分=毕业学分要求）			

建议每学期修读学分	1	2	3	4	5	6	7	8
	24	25	25	25	23	22	8	8

备注：学生毕业时须修满专业教学计划规定学分，并取得第二课堂 7 个人文素质教育学分和 4 个“三创”能力培养学分。

2.类别统计表

学时					学分						
总学时数	其中		其中		总学分数	其中		其中			其中
	必修学时	选修学时	理论教学学时	实验教学学时		必修学分	选修学分	集中实践教学环节学分	理论教学学分	实验教学学分	创新创业教育学分
2272	1792	480	1822	450	160	124	36	28	118	14	13

二、课程设置表

类别	课程代码	课程名称	是否必修	学时数					学分数	开课学期
				总学时	理论	实验	实习	其它		
公共基础课	031101761	习近平新时代中国特色社会主义思想概论	必修课	48	36			12	3.0	1
	031101661	思想道德与法治		40	36			4	2.5	2
	031101371	中国近现代史纲要		40	36			4	2.5	3
	031101424	毛泽东思想和中国特色社会主义理论体系概论		40	36			4	2.5	4
	031101522	马克思主义基本原理		40	36			4	2.5	4
	031101331	形势与政策		64	64				2.0	1-8
	044101383	学术英语（一）		32	32				2.0	1
	044102452	学术英语（二）		32	32				2.0	2
	084101181	人工智能导论（理工科类）		36	24			12	2.0	1
	045102811	Python 语言程序设计		40	32			8	2.0	2
	052100332	体育（一）		36				36	1.0	1
	052100012	体育（二）		36				36	1.0	2
	052100842	体育（三）		36				36	1.0	3
	052100062	体育（四）		36				36	1.0	4
	006100112	军事理论		36	18			18	2.0	2
	041100582	大学物理Ⅰ（一）		48	48				3.0	2
	041101391	大学物理Ⅰ（二）		48	48				3.0	3
	041100671	大学物理实验（一）		32		32			1.0	3
	041101051	大学物理实验（二）		32		32			1.0	4
		人文科学、社会科学领域	通识课	128	128				8.0	
		科学技术领域		32	32				2.0	
	合　计			912	638	64		210	47	

二、课程设置表（续）

类别	课程代码	课程名称	是否必修	学时数					学分数	开课学期
				总学时	理论	实验	实习	其它		
专业基础课	040101591	解析几何	必	48	48				3.0	1
	040100111	高等代数（上）	必	80	80				5.0	1
	040100282	数学分析（一）	必	80	80				5.0	1
	040100931	高等代数（下）	必	80	80				5.0	2
	040100352	数学分析（二）	必	96	96				6.0	2
	040101311	数学分析（三）	必	96	96				6.0	3
	040100131	常微分方程	必	64	64				4.0	3
	040100492	概率论	必	64	64				4.0	3
	040100162	数学模型	必	48	48				3.0	4
	040102821	神经网络与深度学习	必	64	64				4.0	4
	040100061	复变函数	必	64	64				4.0	4
	040102702	抽象代数	必	64	64				4.0	5
	040101052	实变函数	必	64	64				4.0	5
	040100301	数学物理方程	必	64	64				4.0	6
	040101181	泛函分析	必	64	64				4.0	6
	合　计		必	1040	1040				65.0	
选修课	**模块 1：数学选修课**									
	现代数学基础课程									
	040102691	分析与代数选讲	选	32	32				2.0	3
	040101721	初等数论	选	64	64				4.0	3
	040100121	微分几何	选	64	64				4.0	4
	040102682	拓扑学	选	64	64				4.0	5
	040101531	代数学基础	选	64	64				4.0	6
	040102471	微分方程思想方法选讲	选	48	48				3.0	7
	040102741	黎曼曲面与黎曼几何	选	64	64				4.0	7
	计算数学课程									
	040100482	离散数学	选	48	48				3.0	3
	040102671	面向对象程序设计	选	56	40			16	3.0	6
	040100081	数据结构	选	64	64				4.0	3
	040101011	数值分析	选	64	64				4.0	4
	040102241	矩阵计算	选	48	48				3.0	4
	040100871	数学软件与数学实验	选	48	16			32	2.0	4
	040101061	算法设计与分析计	选	64	64				4.0	4
	040102361	数据库系统	选	64	64				4.0	4
	040100181	微分方程数值解	选	48	48				3.0	5
	040102322	数值优化算法	选	64	64				4.0	5
	040102751	有限元方法与计算	选	48	48				3.0	6
	040101331	计算机图形学	选	48	48				3.0	6
	040102731	计算流体力学	选	48	48				3.0	6
	040101581	计算机网络	选	48	48				3.0	8
	统计与优化课程									

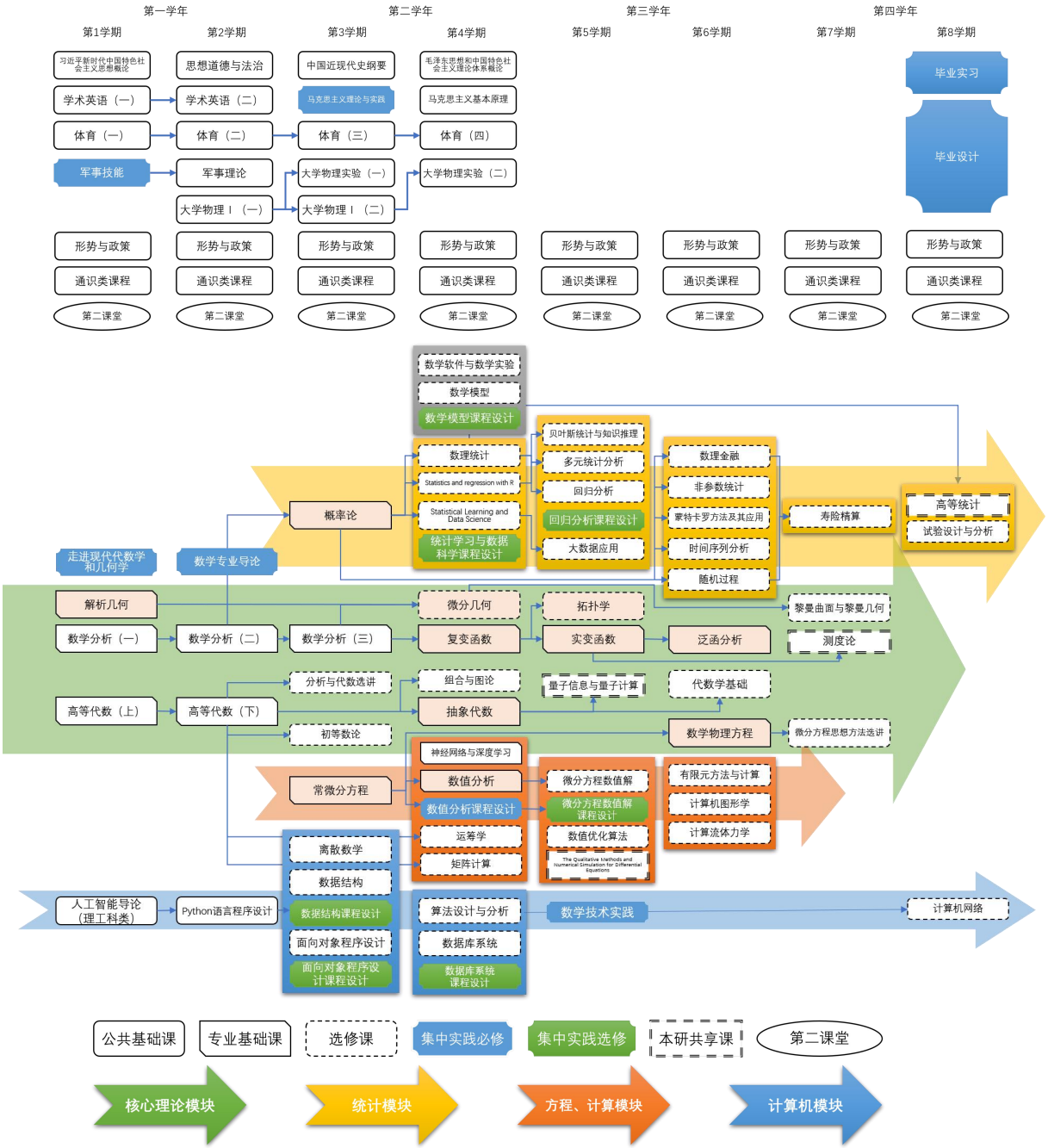
类别	课程代码	课程名称	是否必修	学时数					学分数	开课学期
				总学时	理论	实验	实习	其它		
	040100801	数理统计	选	64	64				4.0	4
	040102722	Statistical Learning and Data Science	选	64	64				4.0	4
	040102721	统计学习与数据科学	选	64	64				4.0	4
	040102831	Statistics and regression with R	选	48	48				3.0	4
	040101131	运筹学	选	64	64				4.0	4
	040102561	贝叶斯统计与知识推理	选	48	48				3.0	5
	040102271	大数据应用	选	32	32				2.0	5
	040100671	多元统计分析	选	64	64				4.0	5
	040102481	回归分析	选	48	48				3.0	5
	040101071	随机过程	选	64	64				4.0	6
	040102091	非参数统计	选	32	32				2.0	6
	040102461	蒙特卡罗方法及其应用	选	48	48				3.0	6
	040100442	数理金融	选	48	48				3.0	6
	040102021	时间序列分析	选	48	48				3.0	6
	040102501	寿险精算	选	48	48				3.0	7
	040102141	试验设计与分析	选	32	32				2.0	8
	模块 2：个性化选修课									
	跨学院（非数学学院）课程	不超过 4（≤ 4）学分	选						≤ 4	
	040102451	量子信息与量子计算	选	64	64				4.0	5
	040102282	The Qualitative Methods and Numerical Simulation for Differential Equations	选	64	64				4.0	5
	040101511	测度论	选	64	64				4.0	7
	040102571	高等统计	选	64	64				4.0	8
	020100051	创新研究训练	选	32				32	2.0	7
	020100041	创新研究实践 I	选	32				32	2.0	7
	020100031	创新研究实践 II	选	32				32	2.0	7
	020100061	创业实践	选	32				32	2.0	7
	合 计		选	选修课修读最低要求 20.0 学分						

备注：学生根据自己开展科研训练项目、学科竞赛、发表论文、获得专利和自主创业等情况申请折算为一定的专业选修课学分（创新研究训练、创新研究实践 I、创新研究实践 II、创业实践等创新创业实践课程）。每个学生累计申请为专业选修课总学分不超过 4 个学分。经学校批准认定为选修课学分的项目、竞赛等不再获得对应第二课堂的创新学分。

三、集中实践教学环节

课 程 代 码	课 程 名 称	是否必修	学 时 数		学分数	开课学期
			实践	授课		
006100151	军事技能	必	2 周		2.0	1
031101551	马克思主义理论与实践	必	2 周		2.0	3
040102661	数学专业导论	必	2 周		2.0	2
040100841	数学模型课程设计	必	2 周		2.0	4
040102581	数学技术实践	必	2 周		2.0	5
040101462	数值分析课程设计	选	3 周		3.0	4
040101521	数据结构课程设计	选	2 周		2.0	3
040102352	数据库系统课程设计	选	2 周		2.0	4
040100361	面向对象程序设计课程设计	选	2 周		2.0	6
040102711	统计学习与数据科学课程设计	选	3 周		3.0	4
040102511	回归分析课程设计	选	2 周		2.0	5
040100292	微分方程数值解课程设计	选	2 周		2.0	5
040100973	毕业实习	必	4 周		4.0	7-8
040100264	毕业设计（论文）	必	15 周		8.0	8
合 计		必	29 周		22.0	
		选	选修课修读最低要求 6.0 学分			

课程拓扑图


第一学年
第二学年
第三学年
第四学年
第1学期
第2学期
第3学期
第4学期
第5学期
第6学期
第7学期
第8学期
习近平新时代中国特色社会主义思想概论
思想道德与法治
中国近现代史纲要
毛泽东思想和中国特色社会主义理论体系概论
毕业实习
学术英语（一）
学术英语（二）
马克思主义理论与实践
马克思主义基本原理
毕业设计
体育（一）
体育（二）
体育（三）
体育（四）
军事技能
军事理论
大学物理实验（一）
大学物理实验（二）
大学物理Ⅰ（一）
大学物理Ⅰ（二）
形势与政策
通识类课程
第二课堂
数学软件与数学实验
数学模型
数学模型课程设计
贝叶斯统计与知识推理
数理统计
多元统计分析
数理金融
Statistics and regression with R
回归分析
非参数统计
概率论
Statistical Learning and Data Science
回归分析课程设计
蒙特卡罗方法及其应用
寿险精算
高等统计
统计学习与数据科学课程设计
大数据应用
时间序列分析
试验设计与分析
随机过程
走进现代代数学和几何学
数学专业导论
解析几何
微分几何
拓扑学
黎曼曲面与黎曼几何
数学分析（一）
数学分析（二）
数学分析（三）
复变函数
实变函数
泛函分析
测度论
分析与代数选讲
组合与图论
量子信息与量子计算
代数学基础
高等代数（上）
高等代数（下）
抽象代数
初等数论
数学物理方程
微分方程思想方法选讲
神经网络与深度学习
常微分方程
数值分析
微分方程数值解
有限元方法与计算
数值分析课程设计
微分方程数值解课程设计
计算机图形学
运筹学
数值优化算法
计算流体力学
矩阵计算
The Qualitative Methods and Numerical Simulation for Differential Equations
离散数学
人工智能导论（理工科类）
Python语言程序设计
数据结构
数据结构课程设计
算法设计与分析
数学技术实践
计算机网络
面向对象程序设计
数据库系统
面向对象程序设计课程设计
数据库系统课程设计
公共基础课
专业基础课
选修课
集中实践必修
集中实践选修
本研共享课
第二课堂
核心理论模块
统计模块
方程、计算模块
计算机模块

四、课程体系与毕业要求关系矩阵

序号	课程名	专业毕业要求										
		1.	2.	3.	4.	5.	6.	7.	8.	9	10	11
1	习近平新时代中国特色社会主义思想						●	●	●	●		
2	思想道德与法治						●	●	●	●		●
3	中国近现代史纲要						●	●	●	●	●	
4	毛泽东思想和中国特色社会主义理论体系概论						●	●	●	●		●
5	马克思主义基本原理						●	●	●	●		●
6	形势与政策						●	●	●	●	●	●
7	学术英语（一）								●		●	●
8	学术英语（二）								●		●	●
9	人工智能导论			●	●	●						●
10	体育（一）						●			●		●
11	体育（二）						●			●		●
12	体育（三）						●			●		●
13	体育（四）						●			●		●
14	军事理论						●		●	●	●	
15	Python 语言程序设计		●			●			●			●
16	大学物理I（一）		●	●			●	●				
17	大学物理I（二）		●	●			●	●				
18	大学物理实验（一）		●	●	●		●	●				
19	大学物理实验（二）		●	●	●		●	●				
20	解析几何	●	●									
21	高等代数（上）	●	●									
22	数学分析（一）	●	●	●								
23	高等代数（下）	●	●									
24	数学分析（二）	●	●	●								
25	数学分析（三）	●	●	●								
26	常微分方程	●	●									
27	概率论	●	●									
28	数学模型	●	●									
29	复变函数	●	●									
30	微分几何	●	●									
31	抽象代数	●	●									
32	实变函数	●	●									
33	拓扑学	●	●									
34	数学物理方程	●	●									
35	泛函分析	●	●									
36	分析与代数选讲	●	●	●								
37	初等数论	●	●		●							
38	代数学基础	●	●				●					
39	微分方程思想方法选讲	●		●								

序号	课程名	专业毕业要求										
		1.	2.	3.	4.	5.	6.	7.	8.	9	10	11
40	黎曼曲面与黎曼几何	●										
41	离散数学	●	●		●							
42	面向对象程序设计	●	●	●								
43	数据结构	●	●	●	●	●						
44	神经网络与深度学习	●	●	●	●							
45	数值分析	●	●	●	●	●						●
46	矩阵计算	●		●	●	●					●	
47	数学软件与数学实验	●	●	●	●							
48	算法设计与分析	●		●	●	●			●			
49	数据库系统	●	●									
50	微分方程数值解	●		●								
51	数值优化算法			●	●				●		●	●
52	有限元方法与计算	●		●	●				●			●
53	计算机图形学	●	●	●	●	●			●			●
54	计算流体力学	●	●	●						●		
55	计算机网络	●	●									
56	数理统计	●		●								
57	Statistical Learning and Data Science	●				●				●		
58	统计学习与数据科学	●				●				●		
59	Statistic and regression with R	●				●					●	
60	运筹学			●		●			●			
61	贝叶斯统计与知识推理	●	●									●
62	机器学习及其应用		●	●	●	●	●	●				●
63	多元统计分析	●	●			●						
64	回归分析	●	●			●						
65	随机过程	●	●									●
66	非参数统计	●	●									●
67	蒙特卡罗方法及其应用	●	●									●
68	数理金融		●				●		●			
69	时间序列分析	●	●			●						
70	寿险精算		●				●		●			
71	试验设计与分析	●	●		●	●						●
72	量子信息与量子计算	●	●				●					
73	测度论	●		●					●			
74	The Qualitative Methods and Numerical Simulation for Differential Equations			●	●				●			
75	高等统计	●	●		●	●						●
76	创新研究训练	●	●			●		●	●			
77	创新研究实践 I	●	●			●		●	●			
78	创新研究实践 II	●	●			●		●	●			
79	创业实践	●	●			●		●	●			

序号	课程名	专业毕业要求										
		1.	2.	3.	4.	5.	6.	7.	8.	9	10	11
80	军事技能							•	•	•	•	•
81	马克思主义理论与实践							•	•	•	•	•
82	走进现代代数学和几何学	•			•							
83	数学专业导论	•	•				•					
84	数学模型课程设计		•	•		•				•		•
85	数学技术实践	•	•	•	•	•						
86	面向对象程序设计课程设计	•	•	•								
87	数据结构课程设计	•	•	•						•		•
88	数据库系统课程设计	•	•	•						•		•
89	数值分析课程设计	•	•	•	•	•					•	
90	统计学习与数据科学课程设计			•		•				•		•
91	回归分析课程设计		•	•		•				•		•
92	毕业实习		•	•		•	•		•		•	•
93	毕业设计（论文）		•	•		•	•	•	•		•	•

五、第二课堂

第二课堂由人文素质教育和“三创”能力培养两部分组成。

1.人文素质教育基本要求

学生在取得专业教学计划规定学分的同时，还应结合自己的兴趣适当参加课外人文素质教育活动，参加活动的学分累计不少于 7 个学分。其中，大学生心理健康教育 2 学分、国家安全教育 1 学分、大学生职业生涯规划 2 学分，纳入人文素质教育学分。

2.“三创”能力培养基本要求

学生在取得本专业教学计划规定学分的同时，还必须参加国家创新创业训练计划、广东省创新创业训练计划、SRP（学生研究计划）、百步梯攀登计划或一定时间的各类课外创新能力培养活动（如学科竞赛、学术讲座等），参加活动的学分累计不少于 4 个学分。

信息与计算科学

Information and Computing Science

专业代码： 070102　　学　制：4 年

培养目标：

坚持学校培养“品德优秀、基础宽厚、思维创新、能力卓越、专业精深”人才的总目标，培养具有社会主义核心价值观，德智体美劳全面发展，面向国家重大战略需求，适应社会发展和科技进步，掌握计算数学的基本理论和信息科学的理论方法与技能和宽广专业知识，具备数学建模、科学计算、信息技术、人工智能等学科交叉能力，能胜任高等教育教学、科学技术研究、工程数据建模与优化、工程计算等专业技术工作，“三力”（学习力、思想力、行动力）卓越，“三创型”（创新、创造、创业）能力突出，具备国际视野和领导意识的行业精英和社会栋梁。

本专业的学生在毕业以后五年左右达到以下目标：

（1）积极应对国家重大战略需求，适应社会发展和科技进步，具备优秀的个人修养与职业道德，并拥有国际视野和领导才能。

（2）具备扎实的数学基础，掌握计算数学与信息科学的基本思想、基本理论与方法以及相关的计算机技术和交叉学科知识。

（3）具有出众的计算数学与信息科学专门领域知识，能够在不同领域中开展基于计算数学与信息科学的基础和应用研究，展现出卓越的研究能力。

（4）能够胜任某一特定领域的专业技术工作，掌握该特定领域相关学科的精深知识，结合计算数学与信息科学的思想和交叉学科领域的研究方法，创新性地解决领域内的实际问题。

毕业要求：

1.业知识与素养。专业知识与素养。掌握扎实的数学基础和专业知识，具有良好的数学思维和数学素养。

2.问题分析。问题分析。能识别并规范表达数学及交叉学科领域的复杂问题，结合文献研究与学科分析得出科学结论。

3.设计/开发解决方案。能够针对数学及交叉学科领域的复杂问题设计和开发解决方案，设计满足特定需求的数学模型、算法或方法，并从计算效率、资源消耗、实际应用可行性等角度考虑方案的合理性。

4.研究能力。能够基于数学、科学和工程原理并采用科学方法对数学及交叉学科领域的复杂问题进行研究，包括设计数值实验、分析与解释数据，并通过信息综合得到合理有效的结论。

5.使用现代工具。能够针对数学及交叉学科领域的复杂问题，开发、选择与使用恰当的技术、资源、现代工程和信息技术工具，对复杂问题进行预测与模拟，并能够理解其局限性。

6.科学与社会。能够基于数学专业相关背景知识进行合理分析，评价复杂科学和工程问题解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。

7.学科认知与发展。理解学科发展规律，评估其对数学及相关领域的推动作用，把握前沿方向。

8.职业规范。具有人文社会科学素养、社会责任感，能够理解和践行学术伦理，在实践工作中遵守学术道德规范和相关法律，履行责任。

9.个人与团队。能够在多样化、多学科背景下的团队中承担个体、团队成员以及负责人的角色。

10.沟通能力。能够就复杂数学和科学问题与同行及社会公众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令；能够在跨文化背景下进行沟通和交流，理解、尊重语言和文化差异。

11.终身学习。具有自主学习和终身学习的意识，有不断学习和适应数学及相关领域发展的能力。

培养目标与毕业要求关系矩阵：

培养目标 / 毕业要求	培养目标 1	培养目标 2	培养目标 3	培养目标 4
专业知识与素养		•	•	•
问题分析		•	•	•
设计/开发解决方案		•	•	•
研究能力		•	•	•
使用现代工具			•	•
科学与社会	•		•	
环境与可持续发展	•		•	
职业规范	•	•		
个人与团队	•		•	
沟通能力	•	•	•	•
终身学习	•	•	•	•

专业简介：

信息与计算科学专业为理学专业，以计算数学为基础，信息行业为背景，在科技攻坚中扮演核心角色，通过突破高性能计算、人工智能算法、密码学与数据处理等“卡脖子”技术，为国产芯片研发、量子计算等前沿科技领域提供关键支撑，同时保障金融、医疗、国防等信息安全。在经济与治理层面，本专业人才推动产业数字化与决策科学化，赋能金融科技、智能治理等领域发展。面对老龄化、气候变化等全球挑战，专业以交叉创新优势应用于精准医疗和智慧城市，提供关键解决方案。本专业培养具有宽厚的数学基础和数学思维能力，掌握信息科学和计算技术的基本理论、方法与技能，能解决信息科学与工程计算中的关键问题，能在科技、教育、信息产业、经济金融等部门从事研究、教学、应用开发和管理工作的高素质、高层次、高水平的创新拔尖人才。2022 年，本专业成为国家级一流本科专业。

信息与计算科学专业始于 2002 年，师资力量雄厚，现有专任教师 18 人，其中教授 4 人、副教授 10 人、讲师 4 人，包括国家重大人才工程青年项目入选者、国家优秀青年基金获得者、广东省杰出青年基金获得者、珠江科技新星等高层次人才 5 人次，形成了一支以中青年教师为骨干，知识结构、年龄结构和职称结构合理的师资队伍。本专业师资具备优异的教学能力，依托广东省数学实验技术示范中心，组建数学建模教练团队，近三年指导学生获数模美赛特等奖 2 项、特等提名奖 18 项，数模国赛一等奖 2 项、二等奖 4 项；注重学生创新能力提升，组成双创导师队伍，近三年共指导学生荣获挑战杯国赛一等奖 1 项、省赛特等奖 3 项、一等奖 1 项。学生就业率 100%，大学生数学建模竞赛成绩名列前列。专业成立有大数据研究中心，建有广东省数学技术实验教学示范中心。拥有学生机房 5 个、多媒体学术交流室和报告厅 6 个。资料室现有图书 6667 册、英文黄皮书 1838 册；期刊 88 种，包括 44 种纯数学类期刊。雄厚的师资力量，丰富的藏书和网络资源极大地满足了信息与计算科学专业师生的学习工作需要。国际化办学成果显著，与加拿大西安大略大学、英国伯明翰大学、爱丁堡大学、法国南特大学等海外高校开展本硕联合培养项目，助力学生拓展国际视野。

专业特色：

1.目标导向：聚焦创新型高水平人才培养，立足计算数学与信息科学，强化人工智能技术与科研创新能力，深化科教协同育人机制。

2.交叉融合：探索“数学+人工智能”融合模式，驱动新工科前沿应用。

3.区域赋能：依托粤港澳大湾区优势，服务地方经济与国家战略，输送高素质人才助力创新发展。

授予学位：

理学学士学位

专业核心课程：

数学分析、高等代数、矩阵计算、常微分方程、数值分析、微分方程数值解、离散数学、数据结构、概率论、神经网络与深度学习、信息论与编码

特色课程：

新生研讨课： 数学专业导论

专题研讨课： 数学模型

全英课程： Introduction to Statistical Learning and Data Science

学科前沿课： 微分方程思想方法选讲

跨学科课程： 神经网络与深度学习、信息论与编码

本研共享课： 微分方程定性方法与数值模拟, 算法设计与分析，有限元方法与计算，计算流体力学

创新实践课： 数值分析课程设计（“三个一”课程）

创业教育课： 数值分析课程设计（“三个一”课程）

竞教结合课： 数学模型、分析与代数选讲

劳动教育课： 数学技术实践

一、各类课程学分登记表

1.学分统计表

课程类别	课程要求	学分	学时	备注
公共基础课	必修	37	752	
	通识	10	160	
专业基础课	必修	60	960	
选修课	选修	25	400	
合　计		132	2272	
集中实践教学环节	必修	23	30 周	
	选修	5	5 周	
毕业学分要求	132+28=160			

建议每学期修读学分	1	2	3	4	5	6	7	8
	24	25	25	25	23	22	8	8

备注：学生毕业时须修满专业教学计划规定学分，并取得第二课堂 7 个人文素质教育学分和 4 个“三创”能力培养学分。

2.类别统计表

学时					学分						
总学时数	其中		其中		总学分数	其中		其中			其中
	必修学时	选修学时	理论教学学时	实验教学学时		必修学分	选修学分	集中实践教学环节学分	理论教学学分	实验教学学分	创新创业教育学分
2272	1712	560	1822	450	160	120	40	28	118	14	4

二、课程设置表

类别	课程代码	课程名称	是否必修	学时数					学分数	开课学期
				总学时	理论	实验	实习	其它		
公共基础课	031101761	习近平新时代中国特色社会主义思想概论	必修课	48	36			12	3.0	1
	031101661	思想道德与法治		40	36			4	2.5	2
	031101371	中国近现代史纲要		40	36			4	2.5	3
	031101424	毛泽东思想和中国特色社会主义理论体系概论		40	36			4	2.5	4
	031101522	马克思主义基本原理		40	36			4	2.5	4
	031101331	形势与政策		64	64				2.0	1-8
	044101383	学术英语（一）		32	32				2.0	1
	044102452	学术英语（二）		32	32				2.0	2
	084101181	人工智能导论（理工科类）		36	24			12	2.0	1
	045102811	Python 语言程序设计		40	32			8	2.0	2
	052100332	体育（一）		36				36	1.0	1
	052100012	体育（二）		36				36	1.0	2
	052100842	体育（三）		36				36	1.0	3
	052100062	体育（四）		36				36	1.0	4
	006100112	军事理论		36	18			18	2.0	2
	041100582	大学物理Ⅰ（一）		48	48				3.0	2
	041101391	大学物理Ⅰ（二）		48	48				3.0	3
	041100671	大学物理实验（一）		32		32			1.0	3
	041101051	大学物理实验（二）		32		32			1.0	4
		人文科学、社会科学领域	通识课	128	128				8.0	
		科学技术领域		32	32				2.0	
	合　计			912	638	64		210	47	

二、课程设置表（续）

类别	课程代码	课程名称	是否必修	学时数					学分数	开课学期
				总学时	理论	实验	实习	其它		
专业基础课	040101591	解析几何	必	48	48				3.0	1
	040100282	数学分析（一）	必	80	80				5.0	1
	040100111	高等代数（上）	必	80	80				5.0	1
	040100931	高等代数（下）	必	80	80				5.0	2
	040100352	数学分析（二）	必	96	96				6.0	2
	040101311	数学分析（三）	必	96	96				6.0	3
	040100131	常微分方程	必	64	64				4.0	3
	040100492	概率论	必	64	64				4.0	3
	040100482	离散数学	必	48	48				3.0	3
	040100081	数据结构	必	64	64				4.0	3
	040101011	数值分析	必	64	64				4.0	4
	040102821	神经网络与深度学习	必	64	64				4.0	4
	040100181	微分方程数值解	必	48	48				3.0	5
	040101401	信息论与编码	必	64	64				4.0	6
	合　计		必	960	960				60.0	
选修课	**模块 1：信息技术选修课**									
	040102361	数据库系统	选	64	64				4.0	4
	040101581	计算机网络	选	48	48				3.0	4
	040101061	算法设计与分析	选	64	64				4.0	4
	040101261	操作系统	选	64	64				4.0	5
	040102671	面向对象程序设计	选	56	40	16			3.0	6
	040102301	数字图像处理	选	32	32				2.0	6
	040101331	计算机图形学	选	48	48				3.0	6
	模块 2：计算数学选修课									
	040102241	矩阵计算	选	48	48				3.0	4
	040100871	数学软件与数学实验	选	48	16			32	2.0	4
	040100162	数学模型	选	48	48				3.0	4
	040102282	微分方程定性方法与数值模拟	选	64	64				4.0	5
	040102811	机器学习及其应用	选	32	32				2.0	5
	040102751	有限元方法与计算	选	48	48				3.0	6
	040102731	计算流体力学	选	48	48				3.0	6
	模块 3：统计优化选修课									
	040102851	AI 数据艺术与科研	选	32	32				2.0	2
	040102801	医学数据分析	选	48	48				3.0	5
	040102841	统计学习前沿	选	64	64				4.0	5
	040101131	运筹学	选	64	64				4.0	4
	040100801	数理统计	选	64	64				4.0	4
	040102722	Statistical Learning and Data Science	选	64	64				4.0	4
	040102721	统计学习与数据科学	选	64	64				4.0	4
	040102322	数值优化算法	选	64	64				4.0	5
	040102561	贝叶斯统计与知识推理	选	48	48				3.0	5
	040101071	随机过程	选	64	64				4.0	6
	040102571	高等统计	选	64	64				4.0	6

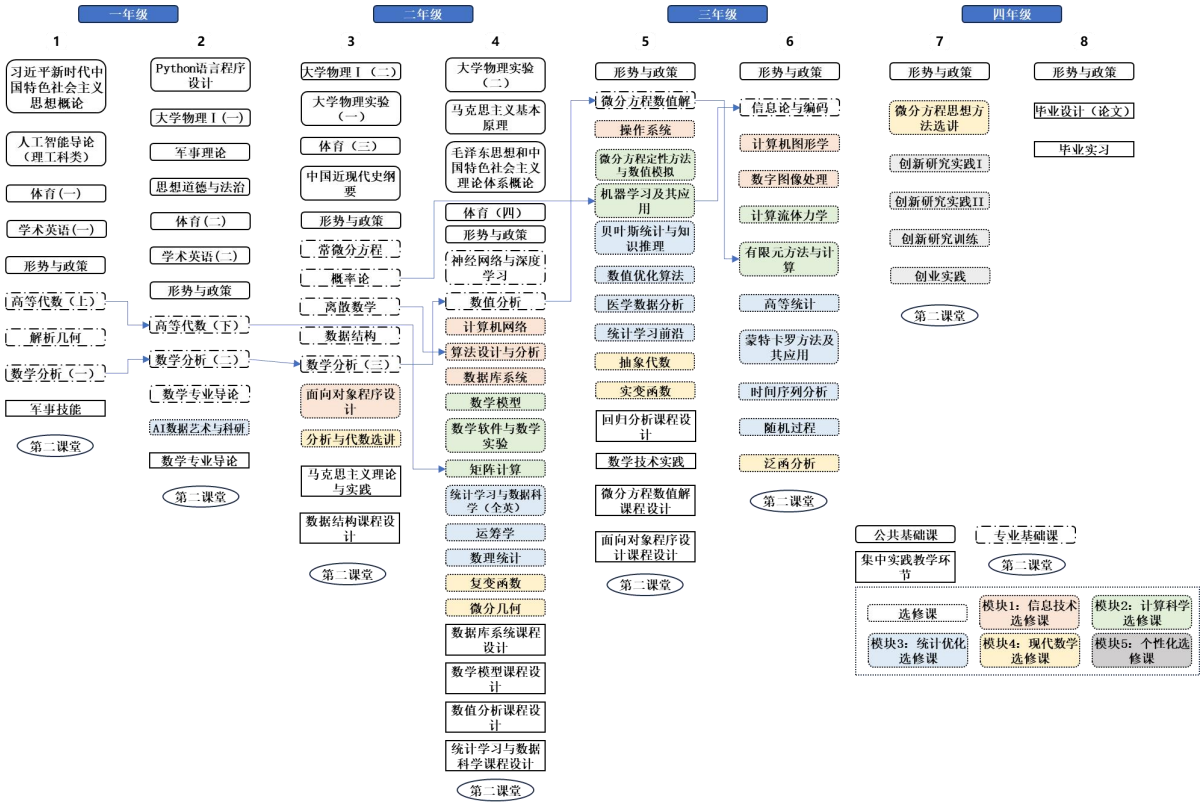
类别	课 程 代 码	课 程 名 称	是否必修	学 时 数					学分数	开课学期
				总学时	理论	实验	实习	其它		
	040102461	蒙特卡罗方法及其应用	选	48	48				3.0	6
	040102021	时间序列分析	选	48	48				3.0	6
	模块 4：现代数学选修课									
	040102691	分析与代数选讲	选	32	32				2.0	3
	040100121	微分几何	选	64	64				4.0	4
	040100061	复变函数	选	64	64				4.0	4
	040102702	抽象代数	选	64	64				4.0	5
	040101052	实变函数	选	64	64				4.0	5
	040101181	泛函分析	选	64	64				4.0	6
	040102471	微分方程思想方法选讲	选	48	48				3.0	7
	模块 5：个性化选修课									
	020100051	创新研究训练	选	32				32	2.0	7
	020100041	创新研究实践 I	选	32				32	2.0	7
	020100031	创新研究实践 II	选	32				32	2.0	7
	020100061	创业实践	选	32				32	2.0	7
	合 计		选	选修课修读最低要求 25.0 学分						

备注：学生根据自己开展科研训练项目、学科竞赛、发表论文、获得专利和自主创业等情况申请折算为一定的专业选修课学分（创新研究训练、创新研究实践 I、创新研究实践 II、创业实践等创新创业实践课程）。每个学生累计申请为专业选修课总学分不超过 4 个学分。经学校批准认定为选修课学分的项目、竞赛等不再获得对应第二课堂的创新学分。

三、集中实践教学环节

课 程 代 码	课 程 名 称	是否必修	学 时 数		学分数	开课学期
			实践	授课		
006100151	军事技能	必	2 周		2.0	1
040102661	数学专业导论	必	2 周		2.0	2
031101551	马克思主义理论与实践	必	2 周		2.0	3
040101521	数据结构课程设计	选	2 周		2.0	3
040100361	面向对象程序设计课程设计	选	2 周		2.0	6
040101462	数值分析课程设计	必	3 周		3.0	4
040102711	统计学习与数据科学课程设计	选	3 周		3.0	4
040100841	数学模型课程设计	选	2 周		2.0	4
040102352	数据库系统课程设计	选	2 周		2.0	4
040102581	数学技术实践	必	2 周		2.0	5
040102511	回归分析课程设计	选	2 周		2.0	5
040100292	微分方程数值解课程设计	选	2 周		2.0	5
040100973	毕业实习	必	4 周		4.0	7-8
040100264	毕业设计（论文）	必	15 周		8.0	8
合 计		必	30 周		23.0	
		选	选修课修读最低要求 5.0 学分			

课程拓扑图



四、课程体系与毕业要求关系矩阵

序号	课程名	信息与计算科学专业毕业要求										
		1	2	3	4	5	6	7	8	9	10	11
1	思想道德与法治						●	●	●	●		
2	习近平新时代中国特色社会主义思想						●	●	●	●		●
3	中国近现代史纲要						●	●	●	●	●	
4	毛泽东思想和中国特色社会主义理论体系概论						●	●	●	●		●
5	马克思主义基本原理						●	●	●	●		●
6	形势与政策						●	●	●	●	●	●
7	学术英语（一）								●		●	●
8	学术英语（二）								●		●	●
9	人工智能导论（理工科类）		●			●			●			●
10	体育（一）						●			●		●
11	体育（二）						●			●		●
12	体育（三）						●			●		●
13	体育（四）						●			●		●
14	军事理论						●		●	●	●	
15	Python 语言程序设计		●			●			●			●
16	大学物理I（一）		●	●			●	●				
17	大学物理I（二）		●	●			●	●				

序号	课程名	信息与计算科学专业毕业要求										
		1	2	3	4	5	6	7	8	9	10	11
18	大学物理实验（一）		●	●	●		●	●				
19	大学物理实验（二）		●	●	●		●	●				
20	数学分析（一）	●	●		●							●
21	数学分析（二）	●	●		●							●
22	数学分析（三）	●	●		●							●
23	解析几何	●	●		●							
24	高等代数（上）	●	●		●							●
25	数学专业导论	●							●		●	
26	高等代数（下）	●	●		●							●
27	离散数学	●				●			●			
28	数据结构		●	●		●						●
29	常微分方程	●	●		●							●
30	概率论	●	●		●							●
31	数理统计	●	●		●							●
32	数值分析	●	●		●	●						●
33	神经网络与深度学习	●	●	●	●				●			●
34	微分方程数值解	●		●	●		●					
35	信息论与编码		●			●			●			●
36	面向对象程序设计			●	●				●			
37	操作系统		●			●			●			●
38	数值优化算法	●	●		●	●						●
39	数字图像处理	●	●		●	●						●
40	复变函数	●	●		●							●
41	实变函数	●	●		●							●
42	抽象代数	●	●		●							●
43	泛函分析	●	●		●							●
44	微分几何	●	●		●							●
45	数学模型	●	●		●	●						●
46	Statistical Learning and Data Science	●	●		●	●				●		
47	时间序列分析	●	●		●							●
48	随机过程	●	●		●							●
49	矩阵计算	●	●	●	●				●		●	●
50	分析与代数选讲			●		●			●			
51	数学软件与数学实验	●			●				●		●	●
52	算法分析与设计		●		●				●			●
53	数据库系统			●		●			●			
54	运筹学			●		●			●			
55	微分方程定性方法与数值模拟			●	●				●			

序号	课程名	信息与计算科学专业毕业要求										
		1	2	3	4	5	6	7	8	9	10	11
56	贝叶斯统计与知识推理	•	•	•	•		•					•
57	机器学习及其应用		•	•	•	•	•	•				•
58	蒙特卡罗方法及其应用		•	•	•		•					•
59	计算机网络			•		•			•		•	•
60	有限元方法与计算	•		•	•				•			•
61	计算机图形学	•		•		•			•			•
62	计算流体力学	•		•		•			•			•
63	微分方程思想方法选讲	•		•		•			•			
64	高等统计	•	•		•	•						•
65	AI 数据艺术与科研					•	•				•	
66	医学数据分析	•			•		•				•	
67	统计学习前沿				•	•	•					
68	创新研究训练	•	•			•		•	•			
69	创新研究实践 I	•	•			•		•	•			
70	创新研究实践 II	•	•			•		•	•			
71	创业实践	•	•			•		•	•			

五、第二课堂

第二课堂由人文素质教育和“三创”能力培养两部分组成。

1.人文素质教育基本要求

学生在取得专业教学计划规定学分的同时，还应结合自己的兴趣适当参加课外人文素质教育活动，参加活动的学分累计不少于 7 个学分。其中，大学生心理健康教育 2 学分、国家安全教育 1 学分、大学生职业生涯规划 2 学分，纳入人文素质教育学分。

2.“三创”能力培养基本要求

学生在取得本专业教学计划规定学分的同时，还必须参加国家创新创业训练计划、广东省创新创业训练计划、SRP（学生研究计划）、百步梯攀登计划或一定时间的各类课外创新能力培养活动（如学科竞赛、学术讲座等），参加活动的学分累计不少于 4 个学分。

统计学

Statistics

专业代码：071201　　学　制：4 年

培养目标：

坚持学校培养“品德优秀、基础宽厚、思维创新、能力卓越、专业精深”人才的总目标，培养具有社会主义核心价值观，德智体美劳全面发展，面向国家重大战略需求，适应社会发展和科技进步，扎实掌握统计学领域基础理论和专业知识，具备数学建模、量化分析、人工智能等学科交叉能力，能胜任高等教育教学、科学技术研究、工程数据建模与优化、金融量化分析等专业技术工作，“三力”（学习力、思想力、行动力）卓越，“三创型”（创新、创造、创业）能力突出的统计学领域优秀人才，具备国际视野和领导意识的行业精英和社会栋梁。

本专业的学生在毕业五年左右达到以下目标：

（1）积极应对国家重大战略需求，适应社会发展和科技进步，具备优秀的个人修养与职业道德，并拥有国际视野和领导才能。

（2）具备扎实的数学基础，掌握统计学的基本思想、理论与方法，以及与统计学相关的计算机技术和交叉学科知识。

（3）具有出众的统计学专门技能，在交叉领域终身学习的能力，能够在不同领域中开展基于统计学方法的基础和应用研究，展现出卓越的研究能力。

（4）能够胜任某一特定领域的高级专业技术工作，掌握该特定领域相关学科的精深知识，运用统计学思想和交叉学科的研究方法，创新性地解决工作领域内的实际问题。

毕业要求：

1. 专业知识与素养。掌握扎实的统计学基础知识和专业领域知识，具有良好的统计学思维和统计学素养。

2. 问题分析。能够运用统计学原理，通过系统的文献调研，对统计学及其交叉学科中的复杂问题进行深入分析，以得出科学结论。

3. 设计/开发解决方案。能够面向交叉领域的复杂问题，设计和开发解决方案，构建统计模型、算法或综合方法，并考量方案的计算效率、资源消耗与可行性。

4. 研究能力。能够基于统计学及相关学科原理，采用科学方法研究复杂理论与应用问题，设计

实验、分析数据，并综合信息得出合理有效的结论。

5. 使用现代工具。能够针对统计学及相关学科领域的复杂问题，开发、选择与使用恰当的技术、资源、现代工程和信息技术工具，对复杂问题进行预测与模拟，并能够理解其局限性。

6. 科学与社会。能够基于统计学专业相关背景知识进行合理分析，评价复杂科学和工程问题解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。

7. 环境与可持续发展。能够理解和评价针对统计学及相关学科领域的复杂问题的实践活动对环境、经济和社会可持续发展的影响。

8. 职业规范。具有人文社会科学素养、社会责任感，能够理解和践行学术伦理，在实践工作中遵守学术道德规范和相关法律，履行责任。

9. 个人与团队。能够在多样化、多学科背景下的团队中承担个体、团队成员以及负责人的角色。

10. 沟通能力。能够就复杂统计学和科学问题与同行及社会公众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令；能够在跨文化背景下进行沟通和交流，理解、尊重语言和文化差异。

11．终身学习。具有自主学习和终身学习的意识，有不断学习和适应统计学及相关领域发展的能力。

培养目标与毕业要求关系矩阵：

培养目标 / 毕业要求	培养目标 1	培养目标 2	培养目标 3	培养目标 4
专业知识与素养		•	•	•
问题分析		•	•	•
设计/开发解决方案		•	•	•
研究能力		•	•	•
使用现代工具			•	•
科学与社会	•		•	
环境与可持续发展	•		•	
职业规范	•	•		
个人与团队	•		•	
沟通能力	•	•	•	•
终身学习	•	•	•	•

专业简介：

统计学专业培养具有扎实的数学基本理论、统计学基础知识和实践方法，具备优秀的数学与统计思维，能够综合运用数学模型、统计分析与计算机技术解决实际问题的高级人才。本专业的毕业生广泛服务于多个领域：在医学领域，运用生物统计方法与数据分析技术助力药物研发、疾病诊断及公共卫生决策；在经济金融领域，通过风险管理模型、投资组合优化及市场预测分析推动金融科技创新和经济政策制定；在工业制造领域，依托质量控制模型和数据驱动的生产管理优化方案提高企业经营效率和竞争力。更以跨学科思维为桥梁，在生物医学、材料科学等交叉领域激发创新突破，成为贯通理论研究与应用实践、破解复杂系统问题的核心动力。

统计学专业办学条件优越，师资力量雄厚。目前本专业拥有专任教师 18 人，其中教授 7 人、副教授 9 人，包括“广东特支计划”百千万工程青年拔尖人才、广东省“南粤优秀教师”、国家海外高层次青年人才等省部级以上人才称号 5 人。学院设有 105 平方米的图书资料室，藏书总计 6667 册，其中英文黄皮书 1838 册，丰富的文献和网络资源有效满足师生的学习科研需求。近年来，本专业多次举办高水平国际和国内学术会议，累计邀请包括菲尔兹奖获得者 2 人、院士 14 人在内的国内外专家学者 400 余人次前来讲学交流。此外，专业注重国际化合作，助力学生拓展全球视野，提升国际竞争力。

专业特色：

1.目标导向：培养具有强烈社会责任感和使命感的高素质统计学人才，厚植理论基础，强化创新实践能力，推进统计学科教育与创新的融合。

2.交叉融合：强调“统计+”模式，强化统计学与人工智能技术融合，促进统计学与理学、工学、农学、医学、经济管理、人文社会科学等领域的跨学科交叉与创新应用。

3.区域赋能：立足国家战略和粤港澳大湾区发展需求，培养能够借助统计方法与计算机工具解决实际问题的复合型人才，服务国家战略实施和地方经济社会发展。

授予学位：理学学士学位

核心课程：

数学分析、高等代数、解析几何、实变函数、数学模型、概率论、数理统计、回归分析、多元统计分析、时间序列分析、随机过程、统计学习与数据科学。

特色课程：

新生研讨课：数学专业导论

专题研讨课：数学模型

全英课程：Statistics and regression with R、The Qualitative Methods and Numerical Simulation for Differential Equations

学科前沿课：微分方程思想方法选讲

跨学科课程：统计学习与数据科学

本研共享课：测度论、高等统计、量子信息与量子计算

创新实践课：数学模型课程设计（“三个一”课程）

创业教育课：数学模型课程设计（“三个一”课程）

竞教结合课：数学模型、分析与代数选讲

劳动教育课：数学技术实践

一、各类课程学分登记表

1.学分统计表

课程类别	课程要求	学分	学时	备注
公共基础课	必修	37	752	
	通识	10	160	
专业基础课	必修	63	1008	
选修课	选修	20	320	
合　计		130	2240	
集中实践教学环节	必修	27	34 周	
	选修	3	3 周	
毕业学分要求	130 ＋ 30＝160			

建议每学期修读学分	1	2	3	4	5	6	7	8
	23	25.5	23.5	21	20	19	16	12

备注：学生毕业时须修满专业教学计划规定学分，并取得第二课堂 7 个人文素质教育学分和 4 个“三创”能力培养学分。

2.类别统计表

学时					学分						
总学时数	其中		其中		总学分数	其中		其中			其中
	必修学时	选修学时	理论教学学时	实验教学学时		必修学分	选修学分	集中实践教学环节学分	理论教学学分	实验教学学分	创新创业教育学分
2240	1760	480	1790	450	160	127	33	30	116	14	13

二、课程设置表

类别	课程代码	课程名称	是否必修	学时数					学分数	开课学期
				总学时	理论	实验	实习	其它		
公共基础课	031101761	习近平新时代中国特色社会主义思想概论	必修课	48	36			12	3.0	1
	031101661	思想道德与法治		40	36			4	2.5	2
	031101371	中国近现代史纲要		40	36			4	2.5	3
	031101424	毛泽东思想和中国特色社会主义理论体系概论		40	36			4	2.5	4
	031101522	马克思主义基本原理		40	36			4	2.5	4
	031101331	形势与政策		64	64				2.0	1-8
	044101383	学术英语（一）		32	32				2.0	1
	044102452	学术英语（二）		32	32				2.0	2
	084101181	人工智能导论（理工科类）		36	24			12	2.0	1
	045102811	Python 语言程序设计		40	32			8	2.0	2
	052100332	体育（一）		36				36	1.0	1
	052100012	体育（二）		36				36	1.0	2
	052100842	体育（三）		36				36	1.0	3
	052100062	体育（四）		36				36	1.0	4
	006100112	军事理论		36	18			18	2.0	2
	041100582	大学物理Ⅰ（一）		48	48				3.0	2
	041101391	大学物理Ⅰ（二）		48	48				3.0	3
	041100671	大学物理实验（一）		32		32			1.0	3
	041101051	大学物理实验（二）		32		32			1.0	4
		人文科学、社会科学领域	通识课	128	128				8.0	
		科学技术领域		32	32				2.0	
	合　计			912	638	64		210	47	

二、课程设置表（续）

类别	课程代码	课程名称	是否必修	学时数					学分数	开课学期
				总学时	理论	实验	实习	其它		
专业基础课	040100282	数学分析（一）	必	80	80				5.0	1
	040100111	高等代数（上）	必	80	80				5.0	1
	040101591	解析几何	必	48	48				3.0	1
	040100352	数学分析（二）	必	96	96				6.0	2
	040100931	高等代数（下）	必	80	80				5.0	2
	040101311	数学分析（三）	必	96	96				6.0	3
	040100492	概率论	必	64	64				4.0	3
	040100162	数学模型	必	48	48				3.0	4
	040100801	数理统计	必	64	64				4.0	4
	040102721	统计学习与数据科学	必	64	64				4.0	4
	040101052	实变函数	必	64	64				4.0	5
	040102481	回归分析	必	48	48				3.0	5
	040100671	多元统计分析	必	64	64				4.0	5
	040102021	时间序列分析	必	48	48				3.0	6
	040101071	随机过程	必	64	64				4.0	6
	合　计		必	1008	1008				63	
选修课	**模块 1：专业选修课（最低要求选修 18.0 学分）**									
	040102851	AI 数据艺术与科研	选	32	32				2.0	2
	040100131	常微分方程	选	64	64				4.0	3
	040100482	离散数学	选	48	48				3.0	3
	040102831	Statistics and regression with R	选	48	48				3.0	4
	040100061	复变函数	选	64	64				4.0	4
	040101131	运筹学	选	64	64				4.0	4
	040100871	数学软件与数学实验	选	48	16			32	2.0	4
	040101061	算法设计与分析	选	64	64				4.0	4
	040101011	数值分析	选	64	64				4.0	4
	040102821	神经网络与深度学习	选	64	64				4.0	4
	040102241	矩阵计算	选	48	48				3.0	4
	040102361	数据库系统	选	64	64				4.0	4
	040102841	统计学习前沿	选	64	64				4.0	5
	040102561	贝叶斯统计与知识推理	选	48	48				3.0	5
	040102322	数值优化算法	选	64	64				4.0	5
	040102811	机器学习与应用	选	32	32				2.0	5
	040102761	投资组合与风险分析	选	48	48				3.0	5
	040101642	微观经济学	选	64	64				4.0	5
	040102682	拓扑学	选	64	64				4.0	5
	040102801	医学数据分析	选	48	48				3.0	5
	040102671	面向对象程序设计	选	56	40			16	3.0	6

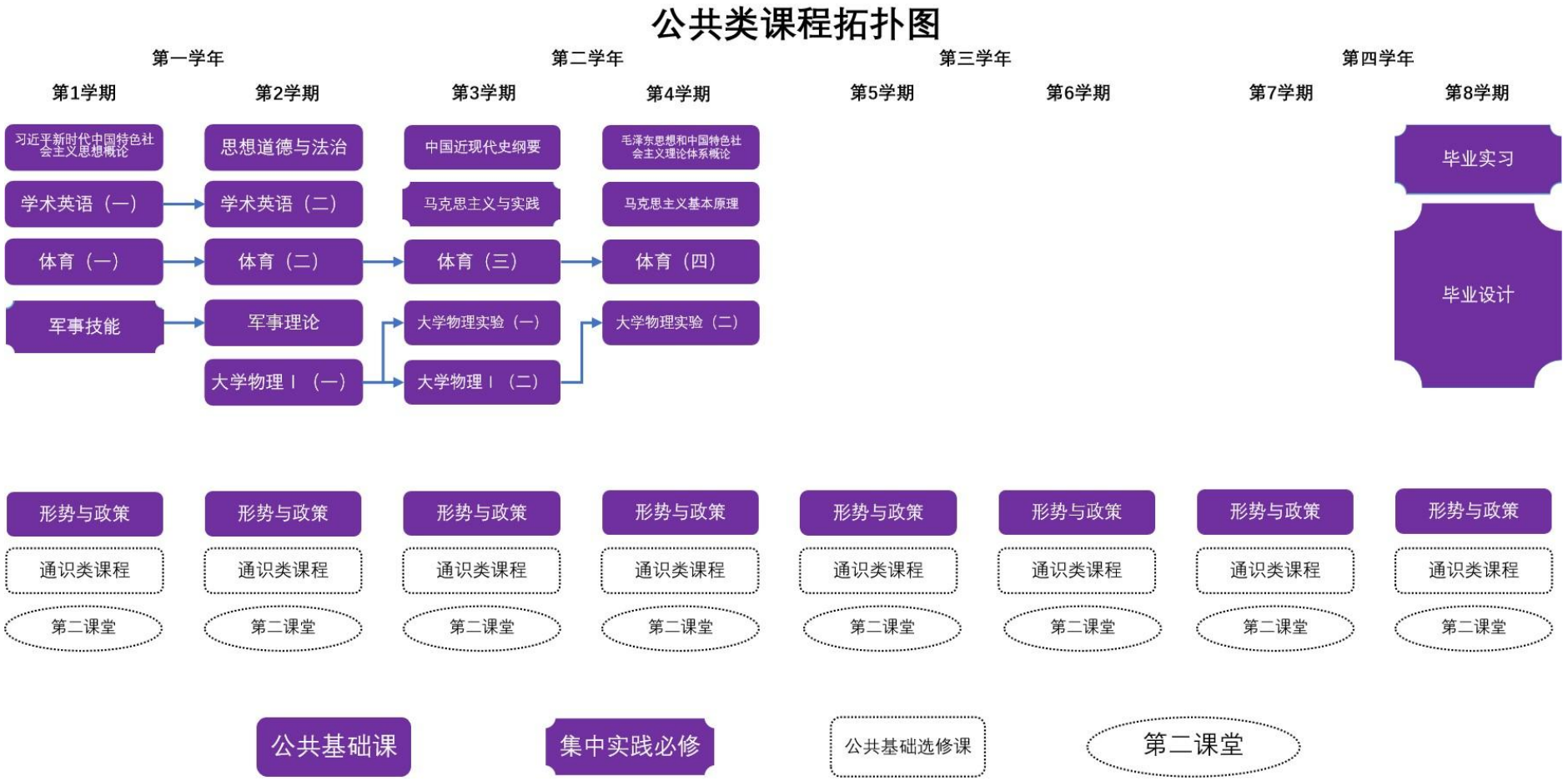
类别	课程代码	课程名称	是否必修	学时数					学分数	开课学期
				总学时	理论	实验	实习	其它		
	040102091	非参数统计	选	32	32				2.0	6
	040101181	泛函分析	选	64	64				4.0	6
	040100442	数理金融	选	48	48				3.0	6
	040102461	蒙特卡罗方法及其应用	选	48	48				3.0	6
	040101032	宏观经济学	选	32	32				2.0	6
	040100301	数学物理方程	选	64	64				4.0	6
	040102501	寿险精算	选	48	48				3.0	7
	040102471	微分方程思想方法选讲	选	48	48				3.0	7
	040102741	黎曼曲面与黎曼几何	选	64	64				4.0	7
	040101511	测度论	选	64	64				4.0	7
	040101581	计算机网络	选	48	48				3.0	8
	040102571	高等统计	选	64	64				4.0	8
	040102141	试验设计与分析	选	32	32				2.0	8
	模块 2：个性化选修课（无最低要求）									
	040102691	分析与代数选讲	选	32	32				2.0	3
	040101721	初等数论	选	64	64				4.0	3
	040100121	微分几何	选	64	64				4.0	4
	040102702	抽象代数	选	64	64				4.0	5
	040102451	量子信息与量子计算	选	64	64				4.0	5
	040100181	微分方程数值解	选	48	48				3.0	5
	040102282	The Qualitative Methods and Numerical Simulation for Differential Equations	选	64	64				4.0	5
	040102751	有限元方法与计算	选	48	48				3.0	6
	040101331	计算机图形学	选	48	48				3.0	6
	040101531	代数学基础	选	64	64				4.0	6
	040102731	计算流体力学	选	48	48				3.0	6
	020100051	创新研究训练	选	32				32	2.0	7
	020100041	创新研究实践 I	选	32				32	2.0	7
	020100031	创新研究实践 II	选	32				32	2.0	7
	020100061	创业实践	选	32				32	2.0	7
	合　计		选	选修课最低要求选修 20 分（含专业和个性化选修）						

备注：学生根据自己开展科研训练项目、学科竞赛、发表论文、获得专利和自主创业等情况申请折算为一定的专业选修课学分（创新研究训练、创新研究实践 I、创新研究实践 II、创业实践等创新创业课程）。每个学生累计申请为专业选修课总学分不超过 4 个学分。经学校批准认定为选修课学分的项目、竞赛等不再获得对应第二课堂的创新学分。

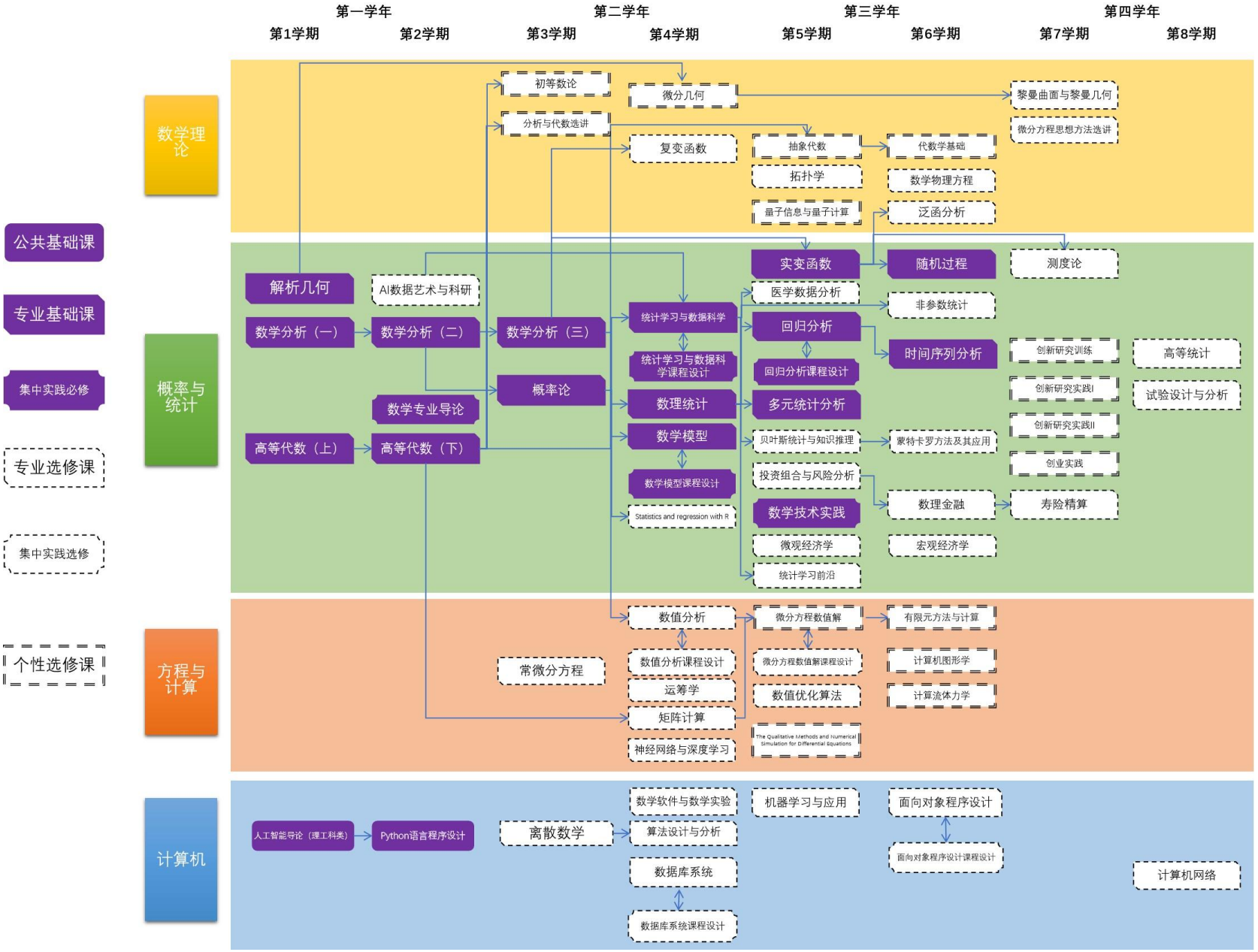
三、集中实践教学环节

课程代码	课程名称	是否必修	学时数		学分数	开课学期
			实践	授课		
006100151	军事技能	必	2 周		2.0	1
040102661	数学专业导论	必	2 周		2.0	2
031101551	马克思主义理论与实践	必	2 周		2.0	3
040100841	数学模型课程设计	必	2 周		2.0	4
040102711	统计学习与数据科学课程设计	必	3 周		3.0	4
040102581	数学技术实践	必	2 周		2.0	5
040102511	回归分析课程设计	必	2 周		2.0	5
040102352	数据库系统课程设计	选	2 周		2.0	4
040101462	数值分析课程设计	选	3 周		3.0	4
040100292	微分方程数值解课程设计	选	2 周		2.0	5
040100361	面向对象程序设计课程设计	选	2 周		2.0	6
040100973	毕业实习	必	4 周		4.0	7-8
040100264	毕业设计（论文）	必	15 周		8.0	8
合 计		必	34 周		27	
		选	集中实践选修课最低要求选修 3 学分			

课程拓扑图


公共类课程拓扑图
第一学年
第二学年
第三学年
第四学年
第1学期
第2学期
第3学期
第4学期
第5学期
第6学期
第7学期
第8学期
习近平新时代中国特色社会主义思想概论
思想道德与法治
中国近现代史纲要
毛泽东思想和中国特色社会主义理论体系概论
学术英语（一）
学术英语（二）
马克思主义与实践
马克思主义基本原理
体育（一）
体育（二）
体育（三）
体育（四）
军事技能
军事理论
大学物理实验（一）
大学物理实验（二）
大学物理Ⅰ（一）
大学物理Ⅰ（二）
毕业实习
毕业设计
形势与政策
通识类课程
第二课堂
公共基础课
集中实践必修
公共基础选修课
第二课堂

专业类课程拓扑图


第一学年
第二学年
第三学年
第四学年
第1学期
第2学期
第3学期
第4学期
第5学期
第6学期
第7学期
第8学期
数学理论
概率与统计
方程与计算
计算机
公共基础课
专业基础课
集中实践必修
专业选修课
集中实践选修
个性选修课
初等数论
微分几何
黎曼曲面与黎曼几何
分析与代数选讲
微分方程思想方法选讲
复变函数
抽象代数
代数学基础
拓扑学
数学物理方程
量子信息与量子计算
泛函分析
实变函数
随机过程
测度论
解析几何
AI数据艺术与科研
医学数据分析
非参数统计
数学分析（一）
数学分析（二）
数学分析（三）
统计学习与数据科学
回归分析
时间序列分析
创新研究训练
高等统计
统计学习与数据科学课程设计
回归分析课程设计
创新研究实践I
试验设计与分析
概率论
数学专业导论
数理统计
多元统计分析
创新研究实践II
数学模型
贝叶斯统计与知识推理
蒙特卡罗方法及其应用
高等代数（上）
高等代数（下）
创业实践
投资组合与风险分析
数学模型课程设计
数理金融
寿险精算
数学技术实践
Statistics and regression with R
微观经济学
宏观经济学
统计学习前沿
数值分析
微分方程数值解
有限元方法与计算
常微分方程
数值分析课程设计
微分方程数值解课程设计
计算机图形学
运筹学
数值优化算法
计算流体力学
矩阵计算
The Qualitative Methods and Numerical Simulation for Differential Equations
神经网络与深度学习
人工智能导论（理工科类）
Python语言程序设计
离散数学
数学软件与数学实验
机器学习与应用
面向对象程序设计
算法设计与分析
面向对象程序设计课程设计
数据库系统
计算机网络
数据库系统课程设计

四、课程体系与毕业要求关系矩阵

序号	课程名	专业毕业要求										
		1.	2.	3.	4.	5.	6.	7.	8.	9	10	11
1	思想道德与法治						●	●	●	●		
2	习近平新时代中国特色社会主义思想						●	●	●	●		●
3	中国近现代史纲要						●	●	●	●	●	
4	毛泽东思想和中国特色社会主义理论体系概论						●	●	●	●		●
5	马克思主义基本原理						●	●	●	●		●
6	形势与政策						●	●	●	●	●	●
7	学术英语（一）								●		●	●
8	学术英语（二）								●		●	●
11	人工智能导论（理工科类）			●	●	●						●
12	体育（一）						●			●		●
13	体育（二）						●			●		●
14	体育（三）						●			●		●
15	体育（四）						●			●		●
16	军事理论						●		●	●	●	
17	Python 语言程序设计		●			●			●			●
18	大学物理I（一）		●	●			●	●				
19	大学物理I（二）		●	●			●	●				
20	大学物理实验（一）		●	●	●		●	●				
21	大学物理实验（二）		●	●	●		●	●				
22	数学分析（一）	●	●		●							●
23	数学分析（二）	●	●		●							●
24	数学分析（三）	●	●		●							●
25	解析几何	●	●		●							
26	高等代数（上）	●	●		●							●
27	数学专业导论	●							●		●	
28	高等代数（下）	●	●		●							●
29	常微分方程	●	●		●							●
30	概率论	●	●									●
31	数理统计	●	●									●
32	数值分析	●	●		●	●						●
33	复变函数	●	●		●							●
34	实变函数	●	●		●							●
35	抽象代数	●	●		●							●
36	数学物理方程	●	●		●							●
37	泛函分析	●	●		●							●
38	拓扑学	●	●		●							●
39	微分几何	●	●		●							●

序号	课程名	专业毕业要求										
		1.	2.	3.	4.	5.	6.	7.	8.	9	10	11
40	数学模型	●	●			●						
41	统计学习与数据科学	●				●				●		
42	多元统计分析	●	●			●						
43	回归分析	●	●			●						
44	时间序列分析	●	●			●						
45	随机过程	●	●									●
46	数理金融		●				●		●			
47	离散数学	●				●			●			
48	微观经济学	●	●						●			
49	面向对象程序设计			●	●				●			
50	矩阵计算	●	●	●	●				●		●	●
51	分析与代数选讲			●		●			●			
52	宏观经济学	●	●						●			
53	数学软件与数学实验	●			●				●		●	●
54	算法设计与分析		●		●				●			●
55	数据库系统			●		●			●			
56	Statistics and regression with R	●				●					●	
57	医学数据分析	●			●	●				●		
58	运筹学			●		●			●			
59	量子信息与量子计算			●		●			●			
60	微分方程数值解	●		●	●		●					
61	The Qualitative Methods and Numerical Simulation for Differential Equations			●	●				●			
62	数值优化算法			●	●				●		●	●
63	初等数论	●		●		●			●			
64	贝叶斯统计与知识推理	●	●									●
65	机器学习与应用		●	●	●	●	●	●				●
66	代数学基础			●	●				●			
67	非参数统计	●	●									●
68	蒙特卡罗方法及其应用	●	●									●
69	计算机网络			●		●			●		●	●
70	神经网络与深度学习	●	●	●	●				●			●
71	有限元方法与计算	●		●	●				●			●
72	计算机图形学	●		●		●			●			●
73	计算流体力学	●		●		●			●			●
74	黎曼曲面与黎曼几何			●		●			●			●
75	寿险精算		●				●		●			
76	测度论	●		●					●			

序号	课程名	专业毕业要求										
		1.	2.	3.	4.	5.	6.	7.	8.	9	10	11
77	微分方程思想方法选讲	●		●		●			●			
78	高等统计	●	●		●	●						●
79	试验设计与分析	●	●		●	●						●
80	投资组合与风险分析			●			●		●			
81	AI 数据艺术与科研					●	●				●	
82	统计学习前沿	●									●	●
83	创新研究训练	●	●			●		●	●			
84	创新研究实践 I	●	●			●		●	●			
85	创新研究实践 II	●	●			●		●	●			
86	创业实践	●	●			●		●	●			

五、第二课堂

第二课堂由人文素质教育和“三创”能力培养两部分组成。

1.人文素质教育基本要求

学生在取得专业教学计划规定学分的同时，还应结合自己的兴趣适当参加课外人文素质教育活动，参加活动的学分累计不少于 7 个学分。其中，大学生心理健康教育 2 学分、国家安全教育 1 学分、大学生职业生涯规划 2 学分，纳入人文素质教育学分。

2.“三创”能力培养基本要求

学生在取得本专业教学计划规定学分的同时，还必须参加国家创新创业训练计划、广东省创新创业训练计划、SRP（学生研究计划）、百步梯攀登计划或一定时间的各类课外创新能力培养活动（如学科竞赛、学术讲座等），参加活动的学分累计不少于 4 个学分。

英文版

Mathematics

The mathematics program consists of an overview of the discipline, distinctive features of the program, educational objectives, and the curriculum. Course arrangements after specialization major are detailed in the respective major-specific training plans. The major training program includes the following components: major name, duration of study, educational goals, graduation requirements, major introduction, major characteristics, core courses, characteristic courses, and the teaching schedule.

Category Profile:

Mathematics is the science that studies quantitative relationships and spatial forms in the objective world, exploring the world through logical reasoning, symbolic computation, and scientific calculation. It serves as the language of nature and the foundation of both natural and social sciences, providing other disciplines with ideas, perspectives, and research methodologies. Mathematics is also a cultural cornerstone, playing a vital role in the progress of human civilization. In today's era of rapid technological advancement, maintaining leadership in mathematics is a national strategic goal for major developed countries.

The Mathematics program offers three majors: Mathematics and Applied Mathematics, Information and Computational Science, and Information Management and Information Systems. Among them, Mathematics and Applied Mathematics and Information and Computational Science are recognized as National First-Class Undergraduate Programs. The Mathematics and Applied Mathematics major is also designated as a National Distinguished Specialty, a Guangdong Provincial Renowned Major, and a Key Discipline. The Information Management and Information Systems major is a Guangdong Provincial Renowned Major. Additionally, the school offers a "Strong Foundation Plan" class in mathematics. The discipline boasts a first-tier doctoral program in mathematics and a postdoctoral research station, with mathematics being a Guangdong Provincial Key Discipline. It also hosts the National Engineering Mathematics Basic Course Teaching Base and the Guangdong Provincial Mathematics Technology Experimental Teaching Demonstration Center.

The Mathematics program has a strong faculty, with 92 full-time teachers, including dual-appointed academicians, recipients of the National Science Fund for

Distinguished Young Scholars (NSFC "Jie Qing"), National Excellent Young Scientists (NSFC "You Qing"), National "Ten Thousand Talents Plan" Teaching Masters, Ministry of Education New Century Excellent Talents, Provincial Teaching Masters, Provincial "Qian Bai Shi" Talent Program scholars, Young Pearl River Scholars, Pearl River Science and Technology New Stars, and Guangdong Special Support Program for Young Top Talents, totaling nearly 20 high-level experts.

For years, the Mathematics program has conducted multilevel joint training programs with top-tier universities in the United States, Canada, the United Kingdom, France, and other countries. It provides abundant library and online resources, including a 105-square-meter reading room housing 6,667 books, of which 1,838 are English-language volumes (yellow-cover series), greatly supporting the academic and research needs of faculty and students.

Education Characteristics:

The mathematics program cultivates "three-abilities" (innovation, creation, and entrepreneurship) talents who possess both patriotism and a global perspective, excel in learning capacity, critical thinking, and execution, and develop comprehensively in moral, intellectual, physical, aesthetic, and labor education.

The mathematics discipline is characterized by its strong foundational nature and broad applicability. Undergraduate students in this program not only acquire systematic and solid fundamental theories, core skills, and specialized knowledge but also gain a certain level of understanding of physics, mechanics, computer science and technology, information and communication engineering, control science and engineering, statistics, and systems science.

The program aims to develop students with:

- Strong mathematical thinking skills, dialectical awareness, innovative mindset, and practical abilities;

- The preliminary ability to identify problems, formulate questions, and analyze and solve problems using mathematical techniques, computational methods, information technology, and statistical tools.

Education Directions:

Upon confirming their major, students proceed to the specialized training phase. The Mathematics program offers three academic tracks, primarily in: Mathematics and Applied Mathematics, Information and Computational Science, and Statistics. Additionally, the school has established a dedicated "Strong Foundation Plan" (Elite Mathematics) Class.

Registration Form of Curriculum Credits

Course Category	Requirement	Credits	Academic Hours	Remarks
General Basic Courses	Compulsory	20.5	384	
	General Education	10	160	
Specialty Basic Courses	Compulsory	24	384	
Practice Training	Compulsory	4	4Weeks	
Total				

1. 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		
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	C	48	36			12	3.0	2
	044101383	English for Academic Purposes (1)	C	32	32				2.0	1
	044102452	English for Academic Purposes (2)	C	32	32				2.0	2
	084101181	Introduction to Artificial Intelligence	C	36	24	12			2.0	1
	052100332	Physical Education (1)	C	36				36	1.0	1
	052100012	Physical Education (2)	C	36				36	1.0	2
	006100112	Military Principle	C	36	18			18	2.0	2
	045102811	Programming in Python language		40	32			8	2.0	2
	041100582	University Physics Ⅰ（一）	C	48	48				3.0	2
		Humanities, Social Science	E	128	128				8.0	
		Science and Technology		32	32				2.0	
	Total		C	544	400	12		114	30.5	
Specialty Basic Courses	040101591	Analytic Geometry	必	48	48				3.0	1
	040100111	Advanced Algebra (Part I)	必	80	80				5.0	1
	040100282	Mathematical Analysis (Part I)	必	80	80				5.0	1
	040100931	Advanced Algebra (Part II)	必	80	80				5.0	2
	040100352	Mathematical Analysis (Part II)	必	96	96				6.0	2
	Total		C	384	384				24	

Practice-concentrated Training	006100151	Military Training	C	2 weeks					2.0	1
	040102661	Introduction to Mathematics Programs	C	2 weeks					2.0	2
	Total		C							
			E	Minimum elective course credits required:						

2. Educational plans after professional streaming

Full details are given in educational plans for each specialty.

英文版

Mathematics and Applied Mathematics

Program Code: 070101　　Duration：4 years

Educational Objectives:

Adhere to the general goal of the school to cultivate talents with "excellent morality, broad foundation, innovative thinking, excellent ability and profound professional skills", and cultivate top-notch talents in the field of mathematics and Applied Mathematics with socialist core values, comprehensive development of morality, intelligence, physique, art and labor, facing the major strategic needs of the country, adapting to social development and scientific and technological progress, mastering solid basic theories and broad professional knowledge in the field of mathematics and applied mathematics, having interdisciplinary abilities such as mathematical modeling, quantitative analysis and artificial intelligence, outstanding "Three Abilities" (learning, thinking and action), and outstanding "Three Abilities" (innovation, creation and Entrepreneurship).

Overview of educational objectives

(1) Actively respond to major national strategic needs, adapt to social development and scientific and technological progress, have excellent personal cultivation and professional ethics, and have international vision and leadership ability.

(2) Have a solid mathematical foundation and broad mathematical theoretical knowledge, and master the basic ideas and methods of mathematics and applied mathematics.

(3) Get strict mathematical thinking training, have solid specialized field knowledge, be able to carry out basic and applied research based on mathematical and applied mathematical methods in different fields, and show high-level scientific research ability.

(4) Be able to have a strong potential ability to use mathematical theory knowledge to solve theoretical and practical problems.

Student Outcomes:

№.1. professional knowledge and literacy. Master solid mathematical foundation and professional knowledge, and have good mathematical thinking and mathematical literacy.

№.2. problem analysis. Be able to identify and standardize the expression of complex problems in mathematics and related fields, and draw scientific conclusions combined with literature research and subject analysis.

№.3. design/develop solutions. Be able to design and develop solutions to complex problems in mathematics and related fields, considering theoretical rigor, computational efficiency and feasibility.

№.4. research ability. Be able to study complex problems in mathematics and related fields based on Mathematics and engineering principles and scientific methods, design experiments, analyze data and draw reasonable conclusions.

№.5. use modern tools. Be able to develop, select and use appropriate technologies, resources, modern engineering and information technology tools for complex problems in mathematics and related fields, predict and simulate complex problems, and understand their limitations.

№.6. science and society. Be able to conduct reasonable analysis based on relevant background knowledge of mathematics major, evaluate the impact of solutions to complex scientific and engineering problems on society, health, safety, law and culture, and understand the responsibilities to be undertaken.

№.7. subject cognition and development. Understand the discipline development law, evaluate its role in promoting mathematics and related fields, and grasp the frontier direction.

№.8. professional norms. Have humanistic and social science literacy and sense of social responsibility, and abide by academic ethics, laws and professional norms.

№.9. individuals and teams. Be able to undertake individual tasks or the role of principal in a multidisciplinary team to achieve collaboration and coordination.

№.10. communication skills. Be able to effectively communicate with peers and the public, and have cross-cultural communication ability.

№.11. lifelong learning. Have the ability of autonomous learning, adapt to the development of disciplines and continuously update the knowledge system.

Relationship Matrix between Educational Objectives and Student Outcomes：

Educational Objectives / Student Outcomes	Educational Objective 1	Educational Objective 2	Educational Objective 3	Educational Objective 4
№1. professional knowledge and literacy		•	•	•
№2. problem analysis		•	•	•
№3. design/develop solutions		•	•	•
№4. research ability		•	•	•
№5. use modern tools			•	•
№6. science and society	•		•	
№7. subject cognition and development	•			•
№8. professional norms	•	•		
№9. individuals and teams	•		•	

Educational Objectives / Student Outcomes	Educational Objective 1	Educational Objective 2	Educational Objective 3	Educational Objective 4
№10. communication skills	•	•	•	•
№11. lifelong learning	•	•	•	•

Program Profile:

As a bridge between basic and applied disciplines, Mathematics and Applied Mathematics radiates extensive social value: In scientific and technological innovation, it provides algorithm optimization and mathematical modeling support for frontiers like artificial intelligence and aerospace. In economics and finance, it constructs risk assessment models and supply chain optimization solutions, promoting fintech development and assisting policy-making. In social governance, it enhances public health prevention efficiency and urban management effectiveness through tools like infectious disease transmission models and intelligent transportation network algorithms, providing quantitative scientific basis for ecological protection. With interdisciplinary thinking, it drives innovative breakthroughs in biomedical sciences, computational social sciences, etc., serving as the core force connecting theoretical research and practical application to solve complex system problems.

The mathematics discipline of South China University of Technology was founded in 1958. After the independent school establishment in 2013, driven by talent cultivation and introduction, its comprehensive teaching and research strength has continuously upgraded, with prominent influence in domestic and international academic circles. It was rated B+ (tied 19th nationally) in the fourth round of discipline evaluation by the Ministry of Education, maintaining excellent performance in the fifth round. In 2019, the school was selected into the Ministry of Education's Strong Foundation Program, and the Mathematics and Applied Mathematics major was approved as a National First-Class Undergraduate Major Construction Site, holding qualifications of National Characteristic Major, Guangdong Famous Major, and Key Major. With a strong faculty, among 92 full-time teachers, there are nearly 20 high-level talents including National Distinguished Young Scholars, "Ten Thousand Talents Program" Teaching Masters, Outstanding Young Scholars, and Ministry of Education New Century Talents, with young and middle-aged teachers as the backbone, forming a scientifically rational team structure. Its international education has achieved remarkable results, carrying out undergraduate-postgraduate joint training programs with overseas universities such as the University of Western Ontario (Canada), the University of Birmingham (UK), the University of Edinburgh (UK), and the University of Nantes (France), helping students expand international horizons.

Program Features:

1. **Goal-oriented**: Focus on cultivating innovative high-level talents, base on disciplinary frontiers, emphasize solid foundations and innovation, and promote the integration of science and education.
2. **Interdisciplinary integration**: Explore the "Mathematics+" model, highlight integration with computer, statistics, and other technologies to empower new engineering and interdisciplinary applications.
3. **Regional empowerment**: Rely on the advantages of the Guangdong-Hong Kong-Macao Greater Bay Area, serve local economy and national strategies, and deliver high-quality talents to boost innovative development.

Degree Conferred:

Bachelor of Science

Core Courses:

Mathematical Analysis, Advanced Algebra, Analytic Geometry, Ordinary Differential Equations, Real Variable Functions, Complex Variable Functions, Abstract Algebra, Equations of Mathematical Physics, Probability Theory, Functional Analysis, Mathematical Models, Neural Networks and Deep Learning

Featured Courses:

Freshmen Seminars: Introduction to Mathematics, Exploring Modern Algebra and Geometry

Special Topics: Mathematical Models

Courses Taught in English: Statistics and Regression with R, Statistical Learning and Data Science, The Qualitative Methods and Numerical Simulation for Differential Equations

Subject Frontiers Courses: Selected Lectures on Ideas and Methods of Differential Equations

Baccalaureate-Master's Sharing Courses: Measure Theory, Advanced Statistics, Quantum Information and Quantum Computation

Innovation Practice: Mathematical Models (Course Design)

Entrepreneurship Courses: Mathematical Models (Course Design)

Competitive Teaching Combination Course: Mathematical Models、Select 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

Course Category	Requirement	Credits	Academic Hours	Remarks
General Basic Courses	Compulsory	37	752	
	General Education	10	160	
Specialty Basic Courses	Compulsory	65	1040	
Elective Courses	Elective	20	320	
Total		132	2272	
Practice Training	Compulsory	22	22weeks	
	Elective	6	6 weeks	
Credits Required for Graduation	132+28=160			

Suggested Credits for Each Semester	1	2	3	4	5	6	7	8
	24	25	25	25	23	22	8	8

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
2272	1792	480	1822	450	160	124	36	28	118	14	13

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		
General Basic Courses	031101761	The Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	C	48	36			12	3.0	1
	031101661	Ethics and Rule of Law		40	36			4	2.5	2
	031101371	Skeleton of Chinese Modern History		40	36			4	2.5	3
	031101424	Thought of Mao ZeDong and Theory of Socialism with Chinese Characteristics		40	36			4	2.5	4
	031101522	Fundamentals of Marxism Principle		40	36			4	2.5	4
	031101331	Analysis of the Situation & Policy		64	64				2.0	1-8
	044101383	English for Academic Purposes (1)		32	32			2.0	1	1
	044102452	English for Academic Purposes (2)		32	32			2.0	2	2
	084101181	Introduction to Artificial Intelligence		36	24	12			2.0	1
	045102811	Python		40	32			8	2.0	2
	052100332	Physical Education (1)		36			36		1.0	1
	052100012	Physical Education (2)		36			36		1.0	2
	052100842	Physical Education (3)		36			36		1.0	3
	052100062	Physical Education (4)		36			36		1.0	4
	006100112	Military Principle		36			18		2.0	2
	041100582	General Physics (1)		48	48				3.0	2
	041101391	General Physics (2)		48	48				3.0	3
	041100671	Physics Experiment (1)		32		32			1.0	3
	041101051	Physics Experiment (2)		32		32			1.0	4
		Humanities, Social Science	E	128	128				8.0	
		Science and Technology		32	32				2.0	
	Total			912	638	64		210	47	

2. Courses Schedule (continued)

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
	040100282	Mathematical Analysis (1)	C	80	80				5.0	1
	040100931	Advanced Algebra (II)	C	80	80				5.0	2
	040100352	Mathematical Analysis (2)	C	96	96				6.0	2
	040101311	Mathematical Analysis (3)	C	96	96				6.0	3
	040100131	Ordinary Differential Equations	C	64	64				4.0	3
	040100492	Probability Theory	C	64	64				4.0	3
	040100162	Mathematical Models	C	48	48				3.0	4
	040102821	Neural Networks and Deep Learning	C	64	64				4.0	4
	040100061	Functions of a Complex Variable	C	64	64				4.0	4
	040102702	Abstract Algebra	C	64	64				4.0	4
	040101052	Real Variable Function	C	64	64				4.0	5
	040100301	Equations of Mathematical Physics	C	64	64				4.0	6
	040101181	Functional Analysis	C	64	64				4.0	6
	Total		C	1040	1040				65.0	
Elective Courses	**Module 1: Optional Courses**									
	Courses on Fundamentals of modern mathematics									
	040102691	Select topics on analysis and algebra	E	32	32				2.0	3
	040101721	Elementary Number theory	E	64	64				4.0	3
	040100121	Differential Geometry	E	64	64				4.0	4
	040102682	Topology	E	64	64				4.0	5
	040101531	Foundations of Algebra	E	64	64				4.0	6
	040102471	Thoughts and Methods in Differential Equations	E	48	48				3.0	7
	040102741	Riemann Surface and Riemann Geometry	E	64	64				4.0	7
	Courses on Computational Mathematics									
	040100482	Discrete Mathematics	E	48	48				3.0	3
	040102671	Object-oriented Programming	E	56	40			16	3.0	6
	040100081	Data Structures	E	64	64				4.0	3
	040101011	Numerical Analysis	E	64	64				4.0	4
	040102241	Matrix calculations	E	48	48				3.0	4
	040100871	Mathematics Software and Mathematics Experiments	E	48	16			32	2.0	4
	040101061	Design and Analysis of Algorithms	E	64	64				4.0	4
	040102361	Database Systems	E	64	64				4.0	4
	040100181	Numerical Methods of Differential Equation	E	48	48				3.0	5
	040102322	Numerical Optimization Algorithms	E	64	64				4.0	5

	040102751	Finite element method and computation	E	48	48				3.0	6
	040101331	Computer Graphics	E	48	48				3.0	6
	040102731	Computational Fluid Dynamics	E	48	48				3.0	6
	040101581	Computer network	E	48	48				3.0	8
	Courses on Statistics and Optimization									
	040100801	Mathematical Statistics	E	64	64				4.0	4
	040102722	Statistical Learning and Data Science	E	64	64				4.0	4
	040102831	Statistic and regression with R	E	48	48				3.0	4
	040101131	Operations Research	E	64	64				4.0	4
	040102561	Bayesian Statistics and Knowledge Reasoning	E	48	48				3.0	5
	040102271	Big Data Application	E	32	32				2.0	5
	040100671	Multivariate Statistical Analysis	E	64	64				4.0	5
	040102481	Regression Analysis	E	48	48				3.0	5
	040101071	Stochastic Process	E	64	64				4.0	6
	040102091	Nonparametric Statistics	E	32	32				2.0	6
	040102461	Monte Carlo Methods with some Applications	E	48	48				3.0	6
	040100442	Mathematical Finance	E	48	48				3.0	6
	040102021	Time Series and Analysis	E	48	48				3.0	6
	040102501	Life Insurances Actuarial Science	E	48	48				3.0	7
	040102141	Experimental Design and Analysis	E	32	32				2.0	8
	Module 2: Personalized elective course									
		Intercollegiate courses (not from School of Mathematics) less than 4 credits	E						≤ 4	
	040102451	Quantum Information and Quantum Computation	E	64	64				4.0	5
	040101511	Measure Theory	E	64	64				4.0	7
	040102282	The Qualitative Methods and Numerical Simulation for Differential Equations	E	64	64				4.0	5
	040102571	Advanced Statistics	E	64	64				4.0	8
	020100051	Innovation Research Training	E	32				32	2.0	7
	020100041	Innovation Research Practice I	E	32				32	2.0	7
	020100031	Innovation Research Practice II	E	32				32	2.0	7
	020100061	Entrepreneurial Practice	E	32				32	2.0	7
	Total		E	Minimum elective course credits required: 20.0						

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
040102661	Introduction to Mathematics Specialty	C	2 weeks		2.0	2
040100841	Mathematical Models (Course Design)	C	2 weeks		2.0	4
040102581	Mathematical Technology Practice	C	2 weeks		2.0	5
040100361	Object-oriented Programming (Course Design)	E	2 weeks		2.0	6
040101521	Data Structures (Course Design)	E	2 weeks		2.0	3
040102352	Database Systems (Course Design)	E	2 weeks		2.0	4
040101462	Numerical Analysis (Course Design)	E	3 weeks		3.0	4
040102711	Statistical Learning and Data Science (Course Design)	E	2 weeks		3.0	4
040102511	Regression Analysis (Course Design)	E	2 weeks		2.0	5
040100292	Numerical Methods of Differential Equation (Course Project)	E	2 weeks		2.0	5
040100973	Graduation Practice	C	4 weeks		4.0	7-8
040100264	Graduation Project	C	15 weeks		8.0	8
Total		C	29 weeks		22.0	
		E	Minimum elective course credits required: 6.0			

4.Relation Matrix between Curriculum System and Student Outcomes

Serial no.	Course Name	Graduation requirements for Information and Computing Sciences										
		1	2	3	4	5	6	7	8	9	10	11
1	The Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era						●	●	●	●		
2	Ethics and Rule of Law						●	●	●	●		●
3	Skeleton of Chinese Modern History						●	●	●	●	●	
4	Thought of Mao ZeDong and Theory of Socialism with Chinese Characteristics						●	●	●	●		●
5	Fundamentals of Marxism Principle						●	●	●	●		●
6	Analysis of the Situation & Policy						●	●	●	●	●	●
7	English for Academic Purposes (1)								●		●	●
8	English for Academic Purposes (2)								●		●	●
9	Introduction to Artificial Intelligence			●	●	●						●
10	Physical Education (1)						●			●		●
11	Physical Education (2)						●			●		●
12	Physical Education (3)						●			●		●
13	Physical Education (4)						●			●		●
14	Military Principle						●		●	●	●	
15	Python		●			●			●			●
16	General Physics (1)		●	●			●	●				
17	General Physics (2)		●	●			●	●				
18	Physics Experiment (1)		●	●	●		●	●				
19	Physics Experiment (2)		●	●	●		●	●				
20	Analytic Geometry	●	●									
21	Advanced Algebra (I)	●	●									
22	Mathematical Analysis(1)	●	●	●								
23	Advanced Algebra (II)	●	●									
24	Mathematical Analysis(2)	●	●	●								
25	Mathematical Analysis(3)	●	●	●								
26	Ordinary Differential Equations	●	●									
27	Probability Theory	●	●									
28	Mathematical Models	●	●									
29	Functions of a Complex Variable	●	●									
30	Differential Geometry	●	●									
31	Abstract Algebra	●	●									
32	Real Variable Function	●	●									
33	Topology	●	●									
34	Equations of Mathematical Physics	●	●									
35	Functional Analysis	●	●									
36	Select topics on analysis and algebra	●	●	●								

Serial no.	Course Name	Graduation requirements for Information and Computing Sciences										
		1	2	3	4	5	6	7	8	9	10	11
37	Elementary Number theory	●	●		●							
38	Foundations of Algebra	●	●				●					
39	Thoughts and Methods in Differential Equations	●		●								
40	Riemann Surface and Riemann Geometry	●										
41	Discrete Mathematics	●	●		●							
42	Object-oriented Programming	●	●	●								
43	Data Structures	●	●	●	●	●						
44	Neural Networks and Deep Learning	●	●	●	●							
45	Numerical Analysis	●	●	●	●	●						●
46	Matrix calculations	●		●	●	●					●	
47	Mathematics Software and Mathematics Experiments	●	●	●	●							
48	Design and Analysis of Algorithms	●		●	●	●			●			
49	Database Systems	●	●									
50	Numerical Methods of Differential Equation	●		●								
51	Numerical Optimization Algorithms			●	●				●		●	●
52	Finite elecment method and computation	●		●	●				●			●
53	Computer Graphics	●	●	●	●	●			●			●
54	Computational Fluid Dynamics	●	●	●						●		
55	Computer network	●	●									
56	Mathematical Statistics	●		●								
57	Statistical Learning and Data Science	●				●				●		
58	Statistic and regression with R	●				●					●	
59	Operations Research			●		●			●			
60	Bayesian Statistics and Knowledge Reasoning	●	●									●
61	Big Data Application		●	●	●	●	●	●				●
62	Multivariate Statistical Analysis	●	●			●						
63	Regression Analysis	●	●			●						
64	Stochastic Process	●	●									●
65	Nonparametric Statistics	●	●									●
66	Monte Carlo Methods with some Applications	●	●									●
67	Mathematical Finance		●				●		●			
68	Time Series and Analysis	●	●			●						
69	Life Insurances Actuarial Science		●				●		●			
70	Experimental Design and Analysis	●	●		●	●						●
71	Quantum Information and Quantum Computation	●	●				●					
72	Measure Theory	●		●					●			
73	The Qualitative Methods and Numerical Simulation for Differential Equations			●	●				●			

Serial no.	Course Name	Graduation requirements for Information and Computing Sciences										
		1	2	3	4	5	6	7	8	9	10	11
74	Advanced Statistics	●	●		●	●						●
75	Innovation Research Training	●	●			●		●	●			
76	Innovation Research Practice I	●	●			●		●	●			
77	Innovation Research Practice II	●	●			●		●	●			
78	Entrepreneurial Practice	●	●			●		●	●			
79	Military Training							●	●	●	●	●
80	Marxism Theory and Practice							●	●	●	●	●
81	Enter Modern Algebra and Geometry	●			●							
82	Introduction to Mathematics Speciality	●	●				●					
83	Mathematical Models （Course Design）		●	●		●				●		●
84	Mathematical Technology Practice	●	●	●	●	●						
85	Object-oriented Programming （Course Design）	●	●	●								
86	Data Structures（Course Design）	●	●	●						●		●
87	Database Systems（Course Design）	●	●	●						●		●
88	Numerical Analysis （Course Design）	●	●	●	●	●					●	
89	Statistical Learning and Data Science（Course Design）			●		●				●		●
90	Regression Analysis（Course Design）		●	●		●				●		●
91	Numerical Methods of Differential Equation (Course Project)	●		●	●		●					
92	Graduation Practice		●	●		●	●		●		●	●
93	Graduation Project		●	●		●	●	●	●		●	●

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

While obtaining the credits required by the professional teaching plan, students should also participate in extracurricular humanities education activities based on their own interests, and the total credits of participating in the activities should be no less than 7 credits. Among them, 2 credits of college students' mental health education, 1 credit of national security education, and 2 credits of college students' career planning are offered online and included in the second classroom humanities education credits.

(2) Basic Requirements of Innovative Ability Cultivation

In addition to obtaining the credits required by the teaching plan of this major, students must also participate in the National Innovation and Entrepreneurship Training Program, the Guangdong Innovation and Entrepreneurship Training Program, the SRP (Student Research Program), the Hundred-Step Ladder Climbing Program, or various extracurricular innovation ability training activities for a certain period of time (such as subject competitions, academic lectures, etc.), and the cumulative credits for participating in the activities must be no less than 4 credits.

英文版

Information and Computing Science

Program Code: 070102　　Duration：4 years

Educational Objectives:

The school adheres to the overall goal of cultivating talents with “excellent moral character, broad foundation, innovative thinking, outstanding ability, and profound professional skills”, cultivates talents with socialist core values, all-round development of morality, intelligence, physical fitness, aesthetics, and labor, facing the major strategic needs of the country, adapting to social development and scientific and technological progress, mastering the basic theories of computational mathematics and theoretical methods and skills of information science and broad professional knowledge, possessing interdisciplinary capabilities such as mathematical modeling, scientific computing, information technology, and artificial intelligence, being competent for professional and technical work such as higher education teaching, scientific and technological research, engineering data modeling and optimization, and engineering computing , with excellent “three powers”(learning power, thinking power, and action power) , outstanding “three creations” (innovation, creation, and entrepreneurship) , and industry elites and social pillars with international vision and leadership awareness.

Students of this major will achieve the following goals within five years after graduation:

（1）Practice the core socialist values, actively respond to the country's major strategic needs, adapt to social development and scientific and technological progress, possess excellent personal cultivation and professional ethics , and have an international perspective and leadership skills.

（2）Have a solid mathematical foundation and master the basic ideas, basic theories and methods of computational mathematics and information science as well as related computer technologies.

（3）Have outstanding specialized knowledge and be able to conduct basic and applied research based on computational mathematics and information science in different fields , demonstrating excellent research capabilities.

（4）Be able to perform professional and technical work in a specific field , master the in-depth knowledge of related disciplines in the specific field , combine the ideas and methods of computational mathematics and information science , and innovatively solve practical problems in the field.

Graduation Requirements:

1. Professional knowledge and literacy. Master solid basic mathematics knowledge and professional field knowledge, and have good mathematical thinking and mathematical literacy.

2. Problem analysis. Be able to apply the basic principles of mathematics and natural sciences to identify,

express and analyze complex problems in mathematics and related disciplines through literature research, taking into account the requirements of sustainable development to obtain effective conclusions.

3. Design/develop solutions. Be able to design and develop solutions for complex problems in mathematics and related disciplines, design mathematical models, algorithms or methods that meet specific needs, and consider the rationality of the solutions from the perspectives of computing efficiency, resource consumption, and practical application feasibility.

4. Research ability. Ability to conduct research on complex problems in mathematics and related disciplines based on mathematical, scientific and engineering principles and using scientific methods, including designing numerical experiments, analyzing and interpreting data, and obtaining reasonable and effective conclusions through information synthesis.

5. Use modern tools. Be able to develop, select and use appropriate techniques, resources, modern engineering and information technology tools to predict and simulate complex problems in mathematics and related disciplines, and understand their limitations.

6. Science and Society. Be able to conduct reasonable analysis based on relevant background knowledge in mathematics, evaluate the impact of solutions to complex scientific and engineering problems on society, health, safety, law, and culture, and understand the responsibilities that should be assumed.

7. Environment and Sustainable Development. Be able to understand and evaluate the impact of practical activities on complex problems in mathematics and related disciplines on the environment, economy and social sustainable development.

8. Professional norms. Have humanities and social science literacy, a sense of social responsibility, be able to understand and practice academic ethics, abide by academic ethics and relevant laws in practical work, and fulfill responsibilities.

9. Individual and Team. Ability to function as an individual, team member, and leader in a diverse, multidisciplinary team.

10. Communication skills. Ability to communicate effectively with peers and the public on complex mathematical and scientific issues, including writing reports and design documents, making presentations, expressing oneself clearly or responding to instructions; ability to communicate in a cross-cultural context, and to understand and respect language and cultural differences.

11. Lifelong learning. Have the awareness of independent and lifelong learning, and the ability to continuously learn and adapt to the development of mathematics and related fields.

Relationship Matrix between Educational Objectives and Student Outcomes：

Educational Objectives / Student Outcomes	Educational Objective 1	Educational Objective 2	Educational Objective 3	Educational Objective 4
1. Professional knowledge and literacy		•	•	•

Educational Objectives / Student Outcomes	Educational Objective 1	Educational Objective 2	Educational Objective 3	Educational Objective 4
2. Problem Analysis		•	•	•
3. Design / develop solutions		•	•	•
4. Research capabilities		•	•	•
5. Use modern tools			•	•
6. Science and Society	•		•	
7. Environment and sustainable development	•		•	
8. Professional Standards	•	•		
9. Individuals and Teams	•		•	
10. Communication skills	•	•	•	•
11. Lifelong learning	•	•	•	•

Program Profile：

The major of Information and Computing Science is a science major. It is based on computational mathematics and has the information industry as its background. It plays a core role in scientific and technological breakthroughs. By breaking through "bottleneck" technologies such as high-performance computing, artificial intelligence algorithms, cryptography and data processing, it provides key support for cutting-edge scientific and technological fields such as domestic chip research and development and quantum computing, while ensuring information security in finance, medical care, national defense, etc. At the economic and governance level, talents in this major promote industrial digitalization and scientific decision-making, and enable the development of financial technology, intelligent governance and other fields. In the face of global challenges such as aging and climate change, the major uses its cross-innovation advantages to apply to precision medicine and smart cities, providing key solutions. This major cultivates high-quality, high-level, and high-level innovative talents with a broad mathematical foundation and mathematical thinking ability, who master the basic theories, methods and skills of information science and computing technology, can solve key problems in information science and engineering computing, and can engage in research, teaching, application development and management in science and technology, education, information industry, economics and finance and other departments. In 2022, this major will become a national first-class undergraduate major.

The major of Information and Computing Science was established in 2002. It has a strong faculty. There are 19 full-time teachers, including 4 professors, 9 associate professors, and 6 lecturers. There are 5 high-level talents, including the selected candidates of the National Major Talent Project Youth Project, the selected candidates of the National Major Talent Plan Youth Project, the Guangdong Outstanding Youth

Fund winners, and the Pearl River Science and Technology Star. A teaching team with middle-aged and young teachers as the backbone and a reasonable knowledge structure, age structure and professional title structure has been formed. The teachers of this major have excellent teaching ability. Relying on the Guangdong Provincial Mathematical Experimental Technology Demonstration Center, a mathematical modeling coaching team has been formed. In the past three years, the teachers have guided students to win 2 special prizes and 18 special nomination prizes in the American Mathematical Modeling Competition, 2 first prizes and 4 second prizes in the National Mathematical Modeling Competition; focus on improving students' innovative ability, form a team of dual innovation mentors, and guide students to win 1 first prize in the Challenge Cup National Competition, 3 special prizes in the Provincial Competition, and 1 first prize in the past three years. The student employment rate is 100%, and the results of the college students' mathematical modeling competition are among the best. The major has established a big data research center and a Guangdong Province Mathematical Technology Experimental Teaching Demonstration Center. It has 5 student computer rooms, 6 multimedia academic exchange rooms and lecture halls. The reference room currently has 6,667 books, 1,838 English yellow books, and 88 journals, including 44 pure mathematics journals. The strong faculty, rich collection of books and network resources greatly meet the learning and work needs of teachers and students in the information and computing science major. The internationalization of education has achieved remarkable results, and has carried out undergraduate and master joint training programs with overseas universities such as the University of Western Ontario in Canada, the University of Birmingham in the UK, the University of Edinburgh, and the University of Nantes in France to help students expand their international horizons.

Program Features:

1. Goal-oriented: Focus on cultivating innovative high-level talents, based on computational mathematics and information science, strengthen artificial intelligence technology and scientific research innovation capabilities, and deepen the mechanism of collaborative education between science and education.

2. Cross-integration: Explore the integration model of " mathematics + artificial intelligence" to drive cutting-edge applications in new engineering disciplines.

3. Regional empowerment: Relying on the advantages of the Guangdong-Hong Kong-Macao Greater Bay Area, serving the local economy and national strategies, and delivering high-quality talents to promote innovative development.

Degree Conferred:

Bachelor of Natural Sciences

Core Courses:

Mathematical analysis, advanced algebra, matrix calculation, ordinary differential equations, numerical analysis, numerical solution of differential equations, discrete mathematics, data structure, probability theory, Neural Networks and Deep Learning , information theory and coding.

Featured Courses:

Freshmen Seminars: Introduction to Mathematics

Special Topics: Mathematical model

Courses Taught in English: Introduction to Statistical Learning and Data Science

Subject Frontiers Courses: Selected Lectures on Ideas and Methods of Differential Equations

Baccalaureate-Master's Integrated Courses: Neural Networks and Deep Learning, Information Theory and Coding

Baccalaureate-Master's Sharing Courses: Qualitative methods and numerical simulation of differential equations, algorithm design and analysis, finite element method and calculation, computational fluid dynamics

Innovation Practice: Numerical Analysis Course Design

Entrepreneurship Courses: Numerical Analysis Course Design

Competition and teaching combined courses：Mathematical model, Analysis and Algebra

Practical Training：Mathematical Technology Practice

1. Registration Form of Curriculum Credits

1.1 Credits Registration Form

Course Category	Requirement	Credits	Academic Hours	Remarks
General Basic Courses	Compulsory	37	752	
	General Education	10	160	
Specialty Basic Courses	Compulsory	60	960	
Elective Courses	Elective	25	400	
Total		132	2432	
Practice Training	Compulsory	23	30 weeks	
	Elective	5	5 weeks	
Credits Required for Graduation	132 + 28 = 160			

Suggested Credits for Each Semester	1	2	3	4	5	6	7	8
	24	25	25	25	23	22	8	8

Note: Students must complete the required credits of the professional teaching plan upon graduation, and obtain 7 credits of humanities education and 4 credits of innovation ability training in the second classroom.

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
2272	1712	560	1822	450	160	120	40	28	118	14	4

Note:

1. General education courses are counted as one of the electives;
2. The "experimental teaching hours" in this table include the experiments, internships and others in the "professional teaching plan";
3. Innovation and entrepreneurship education credits: Courses in the training plan are approved by the teaching guidance committee of each department, including credits for competition-teaching combined courses, innovation practice courses, and entrepreneurship education courses;
4. Compulsory teaching hours + elective teaching hours = total teaching hours; theoretical teaching hours + experimental teaching hours = total teaching hours; compulsory credits + elective credits = total credits; credits for concentrated practical teaching + theoretical teaching credits + experimental teaching credits = total credits.

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		
Public basic courses	031101761	Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	C	48	36			12	3.0	1
	031101661	Ideological Morality and the Rule of Law		40	36			4	2.5	2
	031101371	An Outline of Modern Chinese History		40	36			4	2.5	3
	031101424	An Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics		40	36			4	2.5	4
	031101522	Basic Principles of Marxism		40	36			4	2.5	4
	031101331	Situation and policy		64	64				2.0	1-8
	044101383	Academic English (I)		32	32				2.0	1
	044102452	Academic English (II)		32	32				2.0	2
	084101181	Introduction to Artificial Intelligence (Science and Engineering)		36	24			12	2.0	1
	045102811	Python programming language		40	32			8	2.0	2
	052100332	Sports (I)		36				36	1.0	1
	052100012	Physical Education (II)		36				36	1.0	2
	052100842	Physical Education (III)		36				36	1.0	3
	052100062	Physical Education (IV)		36				36	1.0	4
	006100112	Military theory		36	18			18	2.0	2
	041100582	College Physics I (I)		48	48				3.0	2
	041101391	College Physics I (II)		48	48				3.0	3
	041100671	College Physics Experiment (I)		32		32			1.0	3
	041101051	College Physics Experiment (II)		32		32			1.0	4
		Humanities, Social Science	E	128	128				8.0	
		Science and Technology		32	32				2.0	
	Total			912	638	64		210	47	

Note: The rest of the study hours can be computer and practical study hours.

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
	040100282	Mathematical Analysis (I)	C	80	80				5.0	1
	040100111	Advanced Algebra (Part 1)	C	80	80				5.0	1
	040100931	Advanced Algebra (Part 2)	C	80	80				5.0	2
	040100352	Mathematical Analysis (II)	C	96	96				6.0	2
	040101311	Mathematical Analysis (III)	C	96	96				6.0	3
	040100131	Ordinary differential equations	C	64	64				4.0	3
	040100492	Probability Theory	C	64	64				4.0	3
	040100482	Discrete Mathematics	C	48	48				3.0	3
	040100081	Data Structure	C	64	64				4.0	3
	040101011	Numerical analysis	C	64	64				4.0	4
	040102821	Neural Networks and Deep Learning	C	64	64				4.0	4
	040100181	Numerical solution of differential equations	C	48	48				3.0	5
	040101401	Information Theory and Coding	C	64	64				4.0	6
	total		C	960	960				60.0	
Elective Courses	**Module 1: Information Technology Elective**									
	040102361	Database Systems	E	64	64				4.0	4
	040101581	Computer Network	E	48	48				3.0	4
	040101061	Algorithm Design and Analysis	E	64	64				4.0	4
	040101261	operating system	E	64	64				4.0	5
	040102671	Object-Oriented Programming	E	56	40	16			3.0	6
	040102301	Digital Image Processing	E	32	32				2.0	6
	040101331	Computer Graphics	E	48	48				3.0	6
	Module 2: Computational Mathematics Elective									
	040102241	Matrix calculations	E	48	48				3.0	4
	040100871	Mathematical software and mathematical experiments	E	48	16			32	2.0	4
	040100162	Mathematical model	E	48	48				3.0	4
	040102282	The Qualitative Methods and Numerical Simulation for Differential Equations	E	64	64				4.0	5
	040102811	Machine Learning & Applications	E	32	32				2.0	5
	040102751	Finite Element Method and Calculation	E	48	48				3.0	6
	040102731	Computational Fluid Dynamics	E	48	48				3.0	6
	Module 3: Statistical Optimization Elective									
	040102851	AI Data Art and Scientific Research	E	32	32				2.0	2
	040102801	Medical Data Analysis	E	48	48				3.0	5
	040102841	Frontiers of Statistical Learning	E	64	64				4.0	5

	040101131	Operations Research	E	64	64				4.0	4
	040100801	Mathematical Statistics	E	64	64				4.0	4
	040102722	Statistical Learning and Data Science	E	64	64				4.0	4
	040102322	Numerical Optimization Algorithms	E	64	64				4.0	5
	040102561	Bayesian Statistics and Knowledge Reasoning	E	48	48				3.0	5
	040101071	Random Process	E	64	64				4.0	6
	040102571	Advanced Statistics	E	64	64				4.0	6
	040102461	Monte Carlo method and its application	E	48	48				3.0	6
	040102021	Time Series Analysis	E	48	48				3.0	6
	Module 4: Modern Mathematics Elective									
	040102691	Selected Lectures on Analysis and Algebra	E	32	32				2.0	3
	040100121	Differential geometry	E	64	64				4.0	4
	040100061	Complex function	E	64	64				4.0	4
	040102702	Abstract Algebra	E	64	64				4.0	5
	040101052	Real variable function	E	64	64				4.0	5
	040101181	Functional analysis	E	64	64				4.0	6
	040102471	Selected Lectures on the Ideas and Methods of Differential Equations	E	48	48				3.0	7
	Module 5: Personalized Electives									
	020100051	Innovative research training	E	32				32	2.0	7
	020100041	Innovative Research Practice I	E	32				32	2.0	7
	020100031	Innovative Research Practice II	E	32				32	2.0	7
	020100061	Entrepreneurial Practice	E	32				32	2.0	7
	Total		E	Minimum elective course credits required: 25.0 credits						

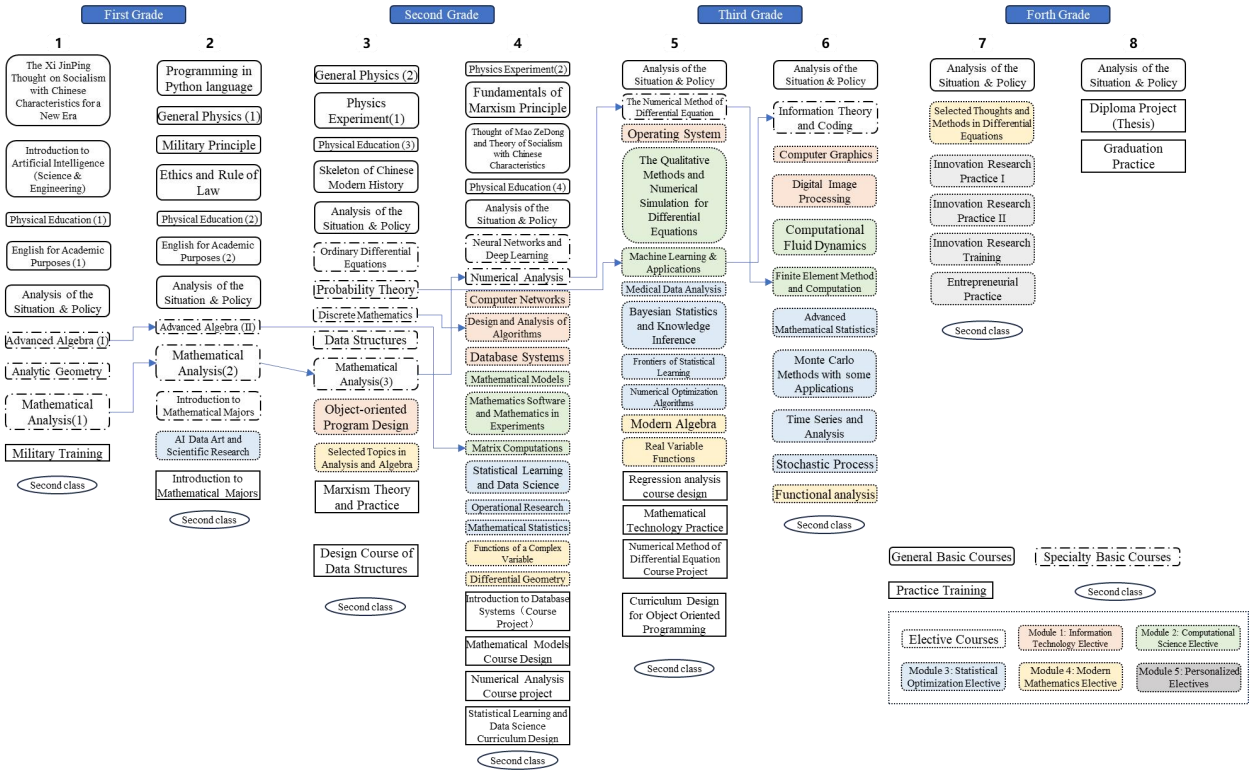
Note: The rest of the study hours can be computer and practical study hours.
Students can apply for certain professional elective credits (Innovation Research Training, Innovation Research Practice I , Innovation Research Practice II , Entrepreneurship Practice and other innovation and entrepreneurship practice courses) based on their own scientific research training projects, subject competitions, paper publications, patents and self-employment . The total credits applied for by each student as professional elective courses shall not exceed 4 credits. Projects and competitions approved by the school as elective credits will no longer receive innovation credits for the corresponding second classroom.

3. Practice-concentrated Training

Course No	Course Title	C/E	Total Curriculum Hours		Credits	Semester
			Practice weeks	Lecture Hours		
006100151	Military skills	C	2 weeks		2.0	1
040102661	Introduction to Mathematics	C	2 weeks		2.0	2
031101551	Marxist theory and practice	C	2 weeks		2.0	3
040101521	Data Structure Course Design	E	2 weeks		2.0	3
040100361	Object-Oriented Programming Course Design	E	2 weeks		2.0	6
040101462	Numerical Analysis Course Design	E	3 weeks		3.0	4
040102711	Statistical Learning and Data Science Course Design	E	3 weeks		3.0	4

040100841	Mathematical Model Course Design	E	2 weeks		2.0	4
040102352	Database System Course Design	E	2 weeks		2.0	4
040102581	Mathematical Technology Practice	E	2 weeks		2.0	5
040100292	Course Design on Numerical Solutions of Differential Equations	E	2 weeks		2.0	5
040100973	Graduation Internship	C	4 weeks		4.0	7-8
040100264	Graduation Project (Thesis)	C	15 weeks		8.0	8
Total		C	30 weeks		23.0	
		E	Minimum elective course credits required: 5.0 credits			

Course topology diagram (must be provided)



4.Relation Matrix between Curriculum System and Student Outcomes

Serial number	Course Name	Graduation requirements for Information and Computing Sciences										
		1	2	3	4	5	6	7	8	9	10	11
1	Ideological Morality and the Rule of Law						●	●	●	●		
2	Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era						●	●	●	●		●
3	An Outline of Modern Chinese History						●	●	●	●	●	
4	An Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics						●	●	●	●		●
5	Basic Principles of Marxism						●	●	●	●		●
6	Situation and policy						●	●	●	●	●	●
7	Academic English (I)								●		●	●
8	Academic English (II)								●		●	●
9	Introduction to Artificial Intelligence (Science and Engineering)		●			●			●			●
10	Sports (I)						●			●		●
11	Physical Education (II)						●			●		●
12	Physical Education (III)						●			●		●
13	Physical Education (IV)						●			●		●
14	Military theory						●		●	●	●	
15	Python programming language		●			●			●			●
16	College Physics I (I)		●	●			●	●				
17	College Physics I (II)		●	●			●	●				
18	College Physics Experiment (I)		●	●	●		●	●				
19	College Physics Experiment (II)		●	●	●		●	●				
20	Mathematical Analysis (I)	●	●		●							●
21	Mathematical Analysis (II)	●	●		●							●
22	Mathematical Analysis (III)	●	●		●							●
23	Analytic Geometry	●	●		●							
24	Advanced Algebra (Part 1)	●	●		●							●
25	Introduction to Mathematics	●							●		●	
26	Advanced Algebra (Part 2)	●	●		●							●
27	Discrete Mathematics	●				●			●			
28	Data Structure		●	●		●						●
29	Ordinary differential equations	●	●		●							●
30	Probability Theory	●	●		●							●
31	Mathematical Statistics	●	●		●							●
32	Numerical analysis	●	●		●	●						●
33	Neural Networks and Deep Learning	●	●	●	●				●			●
34	Numerical solution of differential equations	●		●	●		●					
35	Information Theory and Coding		●			●			●			●

Serial number	Course Name	Graduation requirements for Information and Computing Sciences										
		1	2	3	4	5	6	7	8	9	10	11
36	Object-Oriented Programming			●	●				●			
37	operating system		●			●			●			●
38	Numerical Optimization Algorithms	●	●		●	●						●
39	Digital Image Processing	●	●		●	●						●
40	Complex function	●	●		●							●
41	Real variable function	●	●		●							●
42	Abstract Algebra	●	●		●							●
43	Functional analysis	●	●		●							●
44	Differential geometry	●	●		●							●
45	Mathematical model	●	●		●	●						●
46	Statistical Learning and Data Science	●	●		●	●				●		
47	Time Series Analysis	●	●		●							●
48	Random Process	●	●		●							●
49	Matrix calculations	●	●	●	●				●		●	●
50	Selected Lectures on Analysis and Algebra			●		●			●			
51	Mathematical software and mathematical experiments	●			●				●		●	●
52	Algorithm Analysis and Design		●		●				●			●
53	Database Systems			●		●			●			
54	Operations Research			●		●			●			
55	The Qualitative Methods and Numerical Simulation for Differential Equations			●	●				●			
56	Bayesian Statistics and Knowledge Reasoning	●	●	●	●		●					●
57	Machine Learning & Applications		●	●	●	●	●	●				●
58	Monte Carlo method and its application		●	●	●		●					●
59	Computer Network			●		●			●		●	●
60	Finite Element Method and Calculation	●		●	●				●			●
61	Computer Graphics	●		●		●			●			●
62	Computational Fluid Dynamics	●		●		●			●			●
63	Selected Lectures on the Ideas and Methods of Differential Equations	●		●		●			●			
64	Advanced Statistics	●	●		●	●						●
65	AI Data Art and Scientific Research					●	●				●	
66	Medical Data Analysis	●			●		●				●	
67	Frontiers of Statistical Learning				●	●	●					
68	Innovative research training	●	●			●		●	●			
69	Innovative Research Practice I	●	●			●		●	●			
70	Innovative Research Practice II	●	●			●		●	●			
71	Entrepreneurial Practice	●	●			●		●	●			

5. “Second Classroom” Activities

The second classroom consists of two parts: humanities education and innovation ability cultivation.

1. Basic requirements for humanistic quality education

While obtaining the credits required by the professional teaching plan, students should also participate in extracurricular humanities education activities based on their own interests, and the total credits of participating in the activities should be no less than 7 credits. Among them, 2 credits of college students' mental health education, 1 credit of national security education, and 2 credits of college students' career planning are offered online and included in the second classroom humanities education credits.

2. Basic requirements for cultivating innovative capabilities

In addition to obtaining the credits required by the teaching plan of this major, students must also participate in the National Innovation and Entrepreneurship Training Program, the Guangdong Innovation and Entrepreneurship Training Program, the SRP (Student Research Program), the Hundred-Step Ladder Climbing Program, or various extracurricular innovation ability training activities for a certain period of time (such as subject competitions, academic lectures, etc.), and the cumulative credits for participating in the activities must be no less than 4 credits.

英文版

Statistics

Major code: 071201 Duration: 4 years

Educational Objectives:

This program adheres to the university's overall goal of cultivating talents with "exemplary character, broad foundational knowledge, innovative thinking, outstanding capabilities, and deep professional expertise." It aims to develop high-caliber professionals in statistics who embody the core socialist values and achieve all-around development in moral, intellectual, physical, aesthetic, and labor education. Students will be equipped to address major national strategic needs and adapt to societal development and technological advancement. They will systematically master the fundamental theories and specialized knowledge of statistics, and possess interdisciplinary skills in mathematical modeling, quantitative analysis, and artificial intelligence. Graduates will be capable of excelling in professional roles in higher education, scientific research, engineering data modeling and optimization, and financial quantitative analysis. They will demonstrate excellence in the "Three Powers" (Learning Ability, Critical Thinking, Executive Competence) and the "Three Innovations" (Innovation, Creativity, Entrepreneurship), and develop into professionals with a global perspective and leadership potential—pillars of their fields and society.

Overview of **educational objectives** (5 years after graduation):

(1) Actively respond to major national strategic needs, demonstrate strong personal integrity and professional ethics, and possess international vision and leadership capabilities.

(2) Possess a strong mathematical foundation, and master fundamental ideas, theories, and methods in statistics, as well as relevant computational techniques and interdisciplinary knowledge.

(3) Exhibit outstanding expertise in statistics and maintain the ability for lifelong learning across disciplines, conducting both basic and applied research in diverse fields using statistical methodologies.

(4) Be competent in advanced technical roles within a specific domain, master in-depth knowledge of related disciplines, and apply statistical thinking and interdisciplinary research methods to innovatively solve real-world problems.

Student Outcomes:

1. Professional knowledge and accomplishment. Master solid basic knowledge of statistics and professional field knowledge, and have good statistical thinking and statistical literacy.

2. Problem analysis. Apply statistical principles and conduct comprehensive literature reviews to analyze complex problems in statistics and related interdisciplinary fields, leading to sound scientific

conclusions.

3. Design/develop solutions. Design and develop effective solutions for complex interdisciplinary problems by constructing statistical models, algorithms, or integrated methodologies, while evaluating computational efficiency, resource consumption, and practical feasibility.

4. Research ability. Employ scientific methods based on statistical and related disciplinary principles to investigate theoretical and applied problems. This includes designing experiments, analyzing data, and synthesizing information to draw well-reasoned and effective conclusions.

5. Use modern tools. Ability to develop, select and use appropriate techniques, resources, modern engineering and information technology tools to predict and model complex problems in statistics and related disciplines, and to understand their limitations.

6. Science and Society. Ability to conduct rational analyses based on background knowledge of statistics, evaluate the social, health, safety, legal, and cultural impacts of solutions to complex scientific and engineering problems, and understand the responsibilities that should be assumed.

7. Environment and sustainable development. Ability to understand and evaluate the impact of practical activities on complex issues in statistics and related disciplines on environmental, economic and social sustainability.

8. Professional norms. Have a sense of social responsibility in humanities and social sciences, be able to understand and practice academic ethics, abide by academic ethics and relevant laws in practical work, and fulfill responsibilities.

9. Individuals vs. **teams**. Ability to take on the roles of individual, team member and leader in a diverse, multidisciplinary team.

10. Communication skills. Ability to communicate effectively with peers and the public on complex statistical and scientific issues, including writing reports and design manuscripts, making presentations, and articulating or responding to instructions; Ability to communicate and communicate in cross-cultural contexts, understanding and respecting language and cultural differences.

11. Lifelong learning. Have the awareness of self-directed learning and lifelong learning, and have the ability to continuously learn and adapt to the development of statistics and related fields.

Relationship Matrix between Education Objectives and Student Outcomes

Education Objectives / Student Outcome	Objective 1	Objective 2	Objective 3	Objective 4
1. Professional knowledge and accomplishment		•	•	•
2. Problem analysis		•	•	•
3. Design/develop solutions		•	•	•
4. Research ability		•	•	•
5. Use modern tools			•	•
6. Science and Society	•		•	
7. Environment and sustainable development	•		•	
8. Professional Norms	•	•		
9. Individuals vs. Teams	•		•	
10. Communication skills	•	•	•	•
11. Lifelong learning	•	•	•	•

Program Profile:

The statistics major cultivates senior talents with solid basic mathematical theories, basic statistical knowledge and practical methods, excellent mathematical and statistical thinking, and comprehensive use of mathematical models, statistical analysis and computer technology to solve practical problems. Graduates of this program are employed in a wide range of fields: in the medical field, using biostatistical methods and data analysis techniques to support drug discovery, disease diagnosis and public health decision-making; In the field of economics and finance, we promote fintech innovation and economic policy formulation through risk management models, portfolio optimization and market forecasting analysis; In the field of industrial manufacturing, relying on quality control models and data-driven production management optimization solutions to improve business efficiency and competitiveness. With interdisciplinary thinking as a bridge, it stimulates innovative breakthroughs in interdisciplinary fields such as biomedicine and materials science, and becomes the core driving force for connecting theoretical research and applied practice and solving complex system problems.

The statistics major has excellent educational conditions and strong faculty. At present, there are 18 full-time teachers in this major, including 7 professors and 9 associate professors, including 5 talents at or above the provincial and ministerial level, such as the "Guangdong Special Support Program" for young top-notch talents, the "Outstanding Teachers of Southern Guangdong" in Guangdong Province, and the national overseas high-level young talents. The college has a library of 105 square meters, with a total

collection of 6,667 books, including 1,838 English yellow books, rich literature and network resources to effectively meet the learning and research needs of teachers and students. In recent years, the program has held many high-level international and domestic academic conferences, and has invited more than 400 domestic and foreign experts and scholars, including 2 Fields Medal winners and 14 academicians, to give lectures and exchanges. In addition, the program focuses on international cooperation to help students expand their global horizons and enhance their international competitiveness.

Program features:

1. Goal-oriented: Cultivate high-quality statistical talents with a strong sense of social responsibility and mission, strengthen the theoretical foundation, strengthen the ability of innovation and practice, and promote the integration of statistics education and innovation.

2. Cross-integration: Emphasize the "Statistics+" model, strengthen the integration of statistics and artificial intelligence technology, and promote the interdisciplinary and innovative application of statistics and science, engineering, agriculture, medicine, economic management, humanities and social sciences and other fields.

3. Regional empowerment: Based on the national strategy and the development needs of the Guangdong-Hong Kong-Macao Greater Bay Area, cultivate interdisciplinary talents who can solve practical problems with the help of statistical methods and computer tools, and serve the implementation of national strategies and local economic and social development.

Degree Conferred: Bachelor of Science

Core Courses: Mathematical Analysis, Advanced Algebra, Analytic Geometry, Real Functions, Mathematical Models, Probability Theory, Mathematical Statistics, Regression Analysis, Multivariate Statistical Analysis, Time Series Analysis, Stochastic Processes, Statistical Learning and Data Science。

Featured Courses:

Freshman Seminar: Introduction to Mathematics Major

Workshop: Mathematical Models

Bilingual courses: Stochastic Processes, Abstract Algebra, Riemannian Surfaces, and Riemannian Geometry

English courses: Statistics and regression with R, The Qualitative Methods and Numerical Simulation for

Differential Equations

Frontier Courses: Selected Lectures on Differential Equations and Ideas and Methods

Interdisciplinary Course: Statistical Learning and Data Science

Shared courses: Measurement Theory, Advanced Statistics, Quantum Information and Quantum Computing

Innovative Practice Course: Mathematical Model Course Design ("Three Ones" Course).

Entrepreneurship Education Course: Mathematical Model Courses Design ("Three Ones" Course).

Competitive Teaching Combination Courses: Mathematical Modeling, Analysis and Algebra Selection

Labor Education Class: Mathematics and Technology Practice

1. Registration Form of Curriculum Credits

1.1 Credits Registration Form

Course Category	Requirement	Credits	Academic Hours	Remarks
General Basic Courses	Compulsory	37	752	
	General Education	10	160	
Specialty Basic Courses	Compulsory	63	1008	
Elective Courses	Elective	20	320	
Total		130	2240	
Practice Training	Compulsory	27	34 weeks	
	Elective	3	3 weeks	
Credits Required for Graduation	130 ＋ 30 = 160			

Suggested Credits for Each Semester	1	2	3	4	5	6	7	8
	23	25.5	23.5	21	20	19	16	12

Note: Students are required to complete the required credits of the professional teaching plan upon graduation and obtain 5 credits of humanities quality education and 4 credits of innovation ability training in the second classroom.

1.2 Category Registration Form

Academic Hours					Credits						
Total	Include		Include		Total	Include		Include			Include
	Compulsory	Elective	Theory Teaching	Lab Teaching		Compulsory	Elective	Practice-concentrated Training	Theory Teaching	Lab Teaching	and Entrepreneurship
2240	1760	480	1790	450	160	127	33	30	116	14	13

Footnotes.

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

(2) Lab teaching includes experiments, internships, and others.

(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) Compulsory hours + elective hours = total hours; theoretical teaching hours + lab teaching hours = total hours; Compulsory credits + elective credits = total credits; Practice-concentrated training credits + theoretical teaching credits + lab teaching credits = total credits.

2. Courses Schedule

Course Category	Course No.	Course Title	Compulsory/ Elective	Total Curriculum Hours					Credits	Semester
				Class Hours	Theoretical class hours	Lab Hours	Practice Hours	Other Hours		
General Basic Courses	031101761	The Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	C	48	36			12	3.0	1
	031101661	Ethics and Rule of Law		40	36			4	2.5	2
	031101371	Skeleton of Chinese Modern History		40	36			4	2.5	3
	031101424	Thought of Mao ZeDong and Theory of Socialism with Chinese Characteristics		40	36			4	2.5	4
	031101522	Fundamentals of Marxism Principle		40	36			4	2.5	4
	031101331	Analysis of the Situation & Policy		64	64				2.0	1-8
	044101383	English for Academic Purposes I		32	32				2.0	1
	044102452	English for Academic Purposes II		32	32				2.0	2
	084101181	Introduction to Artificial Intelligence (Science & Engineering)		36	24			12	2.0	1
	045102811	Programming in Python language		40	32			8	2.0	2
	052100332	Physical Education I		36				36	1.0	1
	052100012	Physical Education II		36				36	1.0	2
	052100842	Physical Education III		36				36	1.0	3
	052100062	Physical Education IV		36				36	1.0	4
	006100112	Military Principle		36	18			18	2.0	2
	041100582	General Physics I		48	48				3.0	2
	041101391	General Physics II		48	48				3.0	3
	041100671	Physics Experiment I		32		32			1.0	3
	041101051	Physics Experiment II		32		32			1.0	4
		Humanities, social sciences	E	128	128				8.0	
		Science and technology field		32	32				2.0	
	Total			912	638	64		210	47	

Footnote: Other class hours may include computer lab sessions and practical training.

2. Courses Schedule (continued)

Course Category	Course No.	Course Title	Compulsory/ Elective	Total Curriculum Hours					Credits	Semester
				Class Hours	Theoretical class hours	Lab Hours	Practice Hours	Other Hours		
Specialty Basic Courses	040100282	Mathematics Analysis I	C	80	80				5.0	1
	040100111	Advanced Algebra I		80	80				5.0	1
	040101591	Analytic Geometry		48	48				3.0	1
	040100352	Mathematics Analysis Ⅱ		96	96				6.0	2
	040100931	Advanced Algebra Ⅱ		80	80				5.0	2
	040101311	Mathematics Analysis Ⅲ		96	96				6.0	3
	040100492	Probability		64	64				4.0	3
	040100162	Mathematical Models		48	48				3.0	4
	040100801	Mathematical Statistics		64	64				4.0	4
	040102721	Statistical Learning and Data Science		64	64				4.0	4
	040101052	Real Variable Function		64	64				4.0	5
	040102481	Regression Analysis		48	48				3.0	5
	040100671	Multivariate Statistical Analysis		64	64				4.0	5
	040102021	Time Series and Analysis		48	48				3.0	6
	040101071	Stochastic Process		64	64				4.0	6
	total			1008	1008				63	
Elective Courses	**Module 1: Specialty Electives (Minimum Required Electives of 18.0 Credits)**									
	040102851	AI Data Arts for Science	选	32	32				2.0	2
	040100131	Ordinary Differential Equation		64	64				4.0	3
	040100482	Discrete Mathematics		48	48				3.0	3
	040101572	Statistics and Regression with R		48	48				3.0	4
	040100061	Functions of a Complex Variable		64	64				4.0	4
	040101131	Operational Research		64	64				4.0	4
	040100871	Mathematics Software and Experiments in Mathematics		48	16			32	2.0	4
	040101061	Design and Analysis of Algorithms		64	64				4.0	4
	040101011	Numerical Analysis		64	64				4.0	4
	040102821	Neural Networks and Deep Learning		64	64				4.0	4
	040102241	Matrix Computations		48	48				3.0	4
	040102361	Database Systems		64	64				4.0	4
	040102841	Frontiers in Statistical Learning		64	64				4.0	5
	040102561	Bayesian Statistics and Knowledge Inference		48	48				3.0	5
	040102322	Numerical Optimization Algorithms		64	64				4.0	5
	040102811	Machine Learning and Application		32	32				2.0	5
	040102761	Portfolio and Risk Analysis		48	48				3.0	5
	040101642	Micro Economics		64	64				4.0	5
	040102682	Topology		64	64				4.0	5

	040102801	Medical Data Analysis		48	48				3.0	5
	040102671	Object-oriented Program Design		56	40			16	3.0	6
	040102091	Nonparametric Statistics		32	32				2.0	6
	040101181	Functional Analysis		64	64				4.0	6
	040100442	Mathematical Finance		48	48				3.0	6
	040102461	Monte Carlo Methods with some Applications		48	48				3.0	6
	040101032	Macroeconomics		32	32				2.0	6
	040100301	Equation of Mathematical Physics		64	64				4.0	6
	040102501	Life Insurances Actuarial Science		48	48				3.0	7
	040102471	Thoughts and Methods in Differential Equations		48	48				3.0	7
	040102741	Riemann Surface and Riemann Geometry		64	64				4.0	7
	040101511	Measure Theory		64	64				4.0	7
	040101581	Computer Network		48	48				3.0	8
	040102571	Advanced Mathematical Statistics		64	64				4.0	8
	040102141	Experimental Design and Analysis		32	32				2.0	8
	Module 2: Personalized Electives (No Minimum Requirement)									
	040102691	Selected topics on analysis and algebra		32	32				2.0	3
	040101721	Number Theory		64	64				4.0	3
	040100121	Differential Geometry		64	64				4.0	4
	040102702	Abstract Algebra		64	64				4.0	5
	040102451	Quantum Information and Quantum Computation		64	64				4.0	5
	040100181	The Numerical Method Of Differential Equation		48	48				3.0	5
	040102282	The Qualitative Methods and Numerical Simulation for Differential Equations		64	64				4.0	5
	040102751	Finite element method and computation		48	48				3.0	6
	040101331	Computer Graphics		48	48				3.0	6
	040101531	Basis of Algebra		64	64				4.0	6
	040102731	Computational Fluid Dynamics		48	48				3.0	6
	020100051	Innovation Research Training		32				32	2.0	7
	020100041	Innovation Research Practice I		32				32	2.0	7
	020100031	Innovation Research Practice II		32				32	2.0	7
	020100061	Entrepreneurial Practice		32				32	2.0	7
	Total			**Minimum elective course credits required: 20.0 (Including Specialty and Personalized Electives)**						

Footnote: Other class hours may include computer lab sessions and practical training.
Students may apply to convert their participation in scientific research training projects, academic competitions, published papers, patents obtained, or independent entrepreneurial activities into a certain number of credits for professional elective courses (such as *Innovative Research Training*, *Innovative Research Practice I*, *Innovative Research Practice II*, and *Entrepreneurial Practice*). Each student may accumulate a maximum of 4 credits from such conversions toward professional elective courses. Projects, competitions, etc., that have been approved by the university and recognized as elective course credits **will no longer be eligible** for corresponding innovation credits in the second classroom program.

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
040102661	Introduction to Mathematics Speciality	C	2 weeks		2.0	2
031101551	Marxism Theory and Practice	C	2 weeks		2.0	3
040100841	Mathematical Models Course Design	C	2 weeks		2.0	4
040102711	Statistical Learning and Data Science Course Design	C	3 weeks		3.0	4
040102581	Mathematical Technology Practice	C	2 weeks		2.0	5
040102511	Regression Analysis Course Design	C	2 weeks		2.0	5
040102352	Numerical Analysis Course Design	E	2 weeks		2.0	4
040101462	Database Application Course Project	E	3 weeks		3.0	4
040100292	The Numerical Method Of Differential Equation Course Design	E	2 weeks		2.0	5
040100361	Curriculum Design for Object Oriented Programming	E	2 weeks		2.0	6
040100973	Practice on Diploma Project	C	4 weeks		4.0	7-8
040100264	Graduation project	C	15 weeks		8.0	8
Total		C	34 weeks		27	
		E	Minimum practice-concentrated training elective course credits required: 3.0			

4. Relationship Matrix between Curriculum System and Student Outcomes

Serial Number	Course name	Student Outcomes										
		1.	2.	3.	4.	5.	6.	7.	8.	9	10	11
1	Ethics and Rule of Law						●	●	●	●		
2	The Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era						●	●	●	●		●
3	Skeleton of Chinese Modern History						●	●	●	●	●	
4	Thought of Mao ZeDong and Theory of Socialism with Chinese Characteristics						●	●	●	●		●
5	Fundamentals of Marxism Principle						●	●	●	●		●
6	Analysis of the Situation & Policy						●	●	●	●	●	●
7	English for Academic Purposes I								●		●	●
8	English for Academic Purposes II								●		●	●
11	Introduction to Artificial Intelligence			●	●	●						●
12	Physical Education I						●			●		●
13	Physical Education II						●			●		●
14	Physical Education III						●			●		●
15	Physical Education IV						●			●		●
16	Military Principle						●		●	●	●	
17	Programming in Python language		●			●			●			●
18	General Physics I		●	●			●	●				
19	General Physics I		●	●			●	●				
20	Physics Experiment I		●	●	●		●	●				
21	Physics Experiment II		●	●	●		●	●				
22	Mathematics Analysis I	●	●		●							●
23	Mathematics Analysis Ⅱ	●	●		●							●
24	Mathematics Analysis Ⅲ	●	●		●							●
25	Analytic Geometry	●	●		●							
26	Advanced Algebra I	●	●		●							●
27	Introduction to Mathematics Speciality	●							●		●	
28	Advanced Algebra Ⅱ	●	●		●							●
29	Ordinary Differential Equation	●	●		●							●
30	Probability	●	●									●
31	Mathematical Statistics	●	●									●
32	Numerical Analysis	●	●		●	●						●
33	Functions of a Complex Variable	●	●		●							●
34	Real Variable Function	●	●		●							●
35	Abstract Algebra	●	●		●							●
36	Equation of Mathematical Physics	●	●		●							●
37	Functional Analysis	●	●		●							●
38	Topology	●	●		●							●
39	Differential Geometry	●	●		●							●

Serial Number	Course name	Student Outcomes										
		1.	2.	3.	4.	5.	6.	7.	8.	9	10	11
40	Mathematical Models	●	●			●						
41	Statistical Learning and Data Science	●			●	●				●		
42	Multivariate Statistical Analysis	●	●			●						
43	Regression Analysis	●	●			●						
44	Time Series and Analysis	●	●			●						
45	Stochastic Process	●	●									●
46	Mathematical Finance		●				●		●			
47	Discrete Mathematics	●				●			●			
48	Micro Economics	●	●						●			
49	Object-oriented Program Design			●	●				●			
50	Matrix Computations	●	●	●	●				●		●	●
51	Selected topics on analysis and algebra			●		●			●			
52	Macroeconomics	●	●						●			
53	Mathematics Software and Experiments in Mathematics	●			●				●		●	●
54	Design and Analysis of Algorithms		●		●				●			●
55	Database Systems			●		●			●			
56	Statistics and regression with R	●				●					●	
57	Medical data analysis	●			●	●				●		
58	Operational Research			●		●			●			
59	Quantum Information and Quantum Computation			●		●			●			
60	The Numerical Method of Differential Equation	●		●	●		●					
61	The Qualitative Methods and Numerical Simulation for Differential Equations			●	●				●			
62	Numerical Optimization Algorithms			●	●				●		●	●
63	Number Theory	●		●		●			●			
64	Bayesian Statistics and Knowledge Inference	●	●									●
65	Machine Learning and Application		●	●	●	●	●	●				●
66	Basis of Algebra			●	●				●			
67	Nonparametric Statistics	●	●									●
68	Monte Carlo Methods with some Applications	●	●									●
69	Computer Network			●		●			●		●	●
70	Neural Networks and Deep Learning	●	●	●	●				●			●
71	Finite element method and computation	●		●	●				●			●
72	Computer Graphics	●		●		●			●			●
73	Computational Fluid Dynamics	●		●		●			●			●
74	Riemann Surface and Riemann Geometry			●		●			●			●
75	Life Insurances Actuarial Science		●				●		●			
76	Measure Theory	●		●					●			

Serial Number	Course name	Student Outcomes										
		1.	2.	3.	4.	5.	6.	7.	8.	9	10	11
77	Selected Thoughts and Methods in Partial Differential Equations	●		●		●			●			
78	Higher Statistics	●	●		●	●						●
79	Experimental Design and Analysis	●	●		●	●						●
80	AI Data Arts for Science					●	●				●	
81	Frontiers in Statistical Learning	●									●	●
82	Portfolio and Risk Analysis			●			●		●			
83	Innovation Research Training	●	●			●		●	●			
84	Innovation Research Practice I	●	●			●		●	●			
85	Innovation Research Practice II	●	●			●		●	●			
86	Entrepreneurial Practice	●	●			●		●	●			

5.“Second Classroom” Activities

The second classroom consists of two parts: humanistic quality education and innovation ability training.

1. Basic requirements for humanistic quality education

While obtaining the credits specified in the professional teaching plan, students should also appropriately participate in extracurricular humanistic quality education activities based on their own interests, and the cumulative credits of participating activities should not be less than 7 credits. Among them, 2 credits of mental health education for college students, 1 credit of national security education, and 2 credits of career planning for college students are offered online and included in the second classroom humanistic quality education credits.

2. Basic requirements for the cultivation of innovation ability

In addition to obtaining the credits specified in the teaching plan of the major, students must also participate in the National Innovation and Entrepreneurship Training Program, the Guangdong Innovation and Entrepreneurship Training Program, the SRP (Student Research Program), the Hundred Step Ladder Climbing Program or various extracurricular innovation ability training activities (such as discipline competitions, academic lectures, etc.) for a certain period of time, and the cumulative credits of the activities shall not be less than 4 credits.