

船舶与海洋工程

Naval Architecture and Ocean Engineering

专业代码：081901

学 制： 4 年

Program Code: 081901

Duration: 4 years

培养目标：

本专业培养适应我国现代化建设需要，德智体全面发展，掌握船舶与海洋工程基础理论和知识高级专门人才。毕业生能够在船舶及海洋装备制造企业、设计院、国内外船级社、海事局、港口、航运等企事业单位从事设计、制造、检验、监造和经营管理工作，并具备终身学习的能力。培养的学生在未来的工作岗位中应能够创造性地利用专业知识解决工程实际中遇到的问题，具备良好的团队沟通和合作能力，并逐渐形成船舶与海洋工程项目的组织能力。

Educational Objectives:

This major cultivates students to be senior talents who are suitable for building socialist modernization, comprehensive development in moral, intelligence and sports, mastering basic theory and knowledge of naval architecture and ocean engineering. Graduated students are capable of designing, manufacturing, surveying, supervising and managing in shipbuilding and offshore equipment manufacturing enterprise, designing institute, classification society, maritime bureau, harbor and shipping enterprise, and they also have the ability of life-long learning. The students should be able to creatively use professional knowledge to solve practical engineering problems encountered in the future work, and have good communication and team cooperation ability, and gradually formed the organizational capability in naval architecture and ocean engineering area.

毕业要求：

No1.工程知识：能够将数学、自然科学、工程基础和专业知用于解决船舶与海洋工程领域问题。

No2.问题分析：能够应用数学、自然科学和工程科学的基本原理，识别、表达、并通过文献研究分析船舶与海洋工程问题，以获得有效结论。

No3.设计/开发解决方案：能够设计针对船舶与海洋工程问题的解决方案，设计满足特定需求的系统、单元（部件）或工艺流程，并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。

No4.研究：能够基于科学原理并采用科学方法对船舶与海洋工程问题进行研究，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。

No5.使用现代工具：能够针对船舶与海洋工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，包括对船舶与海洋工程问题的预测与模拟，并能够理解其局限性。

№6.工程与社会：能够基于工程相关背景知识进行合理分析，评价船舶与海洋工程解决方案和实践对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。

№7.环境和可持续发展：能够理解和评价针对船舶与海洋工程问题的专业工程实践对环境、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，能够在工程实践中理解并遵守工程职业道德和规范，履行责任。

№9.个人和团队：能够在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：能够就船舶与海洋工程问题与业界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、清晰表达或正确回应指令。并具备一定的国际视野，能够在跨文化背景下进行沟通和交流。

№11.项目管理：理解并掌握船舶与海洋工程管理原理与经济决策方法，并能在多学科环境中应用。

№12.终身学习：具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

Student Outcomes:

№1.Engineering Knowledge: An ability to apply knowledge of mathematics, science, engineering fundamentals and engineering specialization to the solution of naval architecture and ocean engineering problems.

№2.Problem Analysis: Able to apply the basic principles of mathematics, natural science and engineering science to identify, express problems of naval architecture and ocean engineering, and analyze the problems by literature in order to obtain effective conclusions

№3.Design / Development Solutions: An ability to design solutions for naval architecture and ocean engineering problems and innovatively design systems, components or process that meet specific needs with societal, public health, safety, legal, cultural and environmental considerations.

№4.Research: An ability to conduct investigations of naval architecture and ocean engineering problems based on scientific theories and adopting scientific methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.

№5.Applying Modern Tools: An ability to create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to naval architecture and ocean engineering activities, with an understanding of the limitations.

№6.Engineering and Society: Be able to conduct reasonable analysis based on engineering background knowledge, evaluate the impact of naval architecture and ocean engineering solutions and practices on social, health, safety, law and culture, and understand the responsibilities.

№7.Environment and Sustainable Development: Ability to understand and evaluate the impact of naval architecture and ocean engineering practices on sustainable development of environment and society.

№8.Professional Standards: An understanding of humanity science and social responsibility, being able to

understand and abide by professional ethics and standards responsibly in engineering practice.

№9.Individual and Teams: An ability to function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

№10.Communication: An ability to communicate effectively on naval architecture and ocean engineering problems with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, make clear instructions or response correctly to instructions, and communicate in cross-cultural contexts with international perspective.

№11.Project Management: Understand and master the principles of naval architecture and ocean engineering management and economic decision making, and can be applied in the multidisciplinary environment

№12.Lifelong Learning: With independent learning and lifelong learning awareness, have the ability to learn and adapt to the development continuously.

专业简介:

华南理工大学船舶与海洋工程专业由我校（原华南工学院）首任校长、罗明燏教授作为学科负责人组建于 1958 年。我校是新中国成立以来大陆设立造船专业的七所高校之一，1965 年开始招收研究生，1981 年成为全国首批船舶工程学科硕士授权点，2003 年获得船舶与海洋结构物设计制造二级学科博士学位授予权，2014 年设立了船舶与海洋工程博士后科研流动站。

本学科办学 50 多年来，已经培养了 2500 余名本科生、300 多名的硕士研究生、近 50 名博士研究生，这些毕业生已经在全国、尤其是在华南地区的船海企业成为技术骨干。目前华南地区三分之一以上的船舶与海洋工程企业的总工程师或企业负责人毕业于我校。

本专业拥有华南地区最大的 120 米船模拖曳试验水池，也是华南地区唯一的一座完全深水船模拖曳试验水池；拥有近海与海岸工程试验水池，建筑面积 1800 m²，可进行港口、近海与海岸工程波浪环境及模型研究实验。本专业拥有广东省船舶与海洋工程技术研究开发中心、广州现代产业技术研究院船舶技术研发中心和工信部深海工程与高技术船舶协同创新平台等以服务国家南海战略、服务珠三角地区现代化大型船舶与海洋工程装备制造企业为导向的研究平台与创新基地。

Program Profile:

The major of Naval Architecture and Ocean Engineering in South China University of Technology was founded in 1958 by professor Luo, Mingyu who is the first president of our university (formerly Southern China Polytechnic Institute). Our university is one of seven universities in mainland who set up the major of shipbuilding. We began to recruit graduate students in 1965, and became one of the first universities who owned the master's degree authorization points of ship engineering in 1981. We got the 2nd degree doctoral granting authorization for major of naval architecture and ocean engineering structure design and manufacturing in 2003, and established postdoctoral research station for major of naval architecture and

ocean engineering in 2014.

We have trained more than 2500 undergraduates, more than 300 graduate students and nearly 50 doctoral students ever since 1958. These graduates have become the technical backbone in ship and ocean enterprises around China, especially in the Southern China. More than 1/3 of the chief engineer or the responsible person of the ship and ocean enterprises in the Southern China, graduated from our university.

We have a 120-meters-long ship model towing tank which is largest one in the Southern China. This tank is also the only complete deep water ship model towing tank in the Southern China. We have another tank for offshore and coastal engineering experiments with the construction area of 1800 m². The second tank can carry out experiments for wave environment and model research in port, offshore and coastal engineering.

We have three research centers including:(1) the Research and Development Center of Naval Architecture and Ocean Engineering Technology of Guangdong Province, (2)Ship Technology Research and Development Center in Guangzhou Modern Industrial Technology Research Institute, and (3)the Collaborative Innovation Platform of Deep Sea Engineering and High Technology Ship (supported by the Ministry of Industry and Information Technology of the People's Republic of China). These research centers are aimed for serving the national strategies in South China Sea and serving the large manufacturing enterprises for shipbuilding and ocean engineering equipment in the Pearl River Delta region.

专业特色：

本专业主要以服务华南船舶产业、面向南海的新能源开发为特色。新船型开发体现“华南特色”；“面向南海”海洋环境机理研究；新能源开发技术及节能装置“绿色环保”；海洋工程装备研发“立足高端”。

Program Features:

This major features the service of Southern China shipbuilding industry and the development of new energy resources facing the South China Sea.

授予学位：工学学士学位

Degree Conferred: Bachelor of Engineering

主干课程：

理论力学、材料力学、流体力学、船舶静力学、船舶结构力学、船舶设计原理、船舶建造工艺与现代造船技术。

Core Courses:

Theoretical Mechanics, Material Mechanics, Fluid Mechanics, Ship Statics, Ship Resistance, Ship Propulsion, Structural Mechanics for Ships, Ship Strength and Structure Design, Design Principle of Ship,

Shipbuilding Technology.

特色课程：

双语教学课程：船舶与海洋工程导论、船舶振动、海洋工程环境

研究型课程：海洋工程数值分析方法导论

创新实践课程：高性能船设计

创业教育课程：船舶工程经济学

Featured Courses:

Bilingual Courses: Introduction to Naval Architecture and Ocean Engineering, Ship Vibration, Ocean Engineering Environment

Research Courses: Introduction to Numerical Analysis Methods on Ocean Engineering

Special Topics:

Innovation Practice: Design of High Performance Vehicle

Entrepreneurship Courses: Economy of Ship Engineering

2.类别统计表 (Category Registration Form)

学时 Academic Hours					学分 Credits						
总学时数 Total	其中 Include		其中 Include		总学分数 Total	其中 Include		其中 Include			其中 Include
	必修学时 Compulsory	选修学时 Elective	理论教学学时 Theory Course	实验教学学时 Lab		必修学分 Compulsory	选修学分 Elective	集中实践教学环节学分 Practice-concentrated Training	理论教学学分 Theory Course Credits	实验教学学分 Lab	创新创业教育学分 Innovation and Entrepreneurship Education
2286	1870	416	2014	272	180	154	26	37	134.5	8.5	7.0

三、专业教学计划表 (Teaching Schedule)

类别 Course Category	课程 代码 Course No.	课程名称 Course Title	是否 必修 C/E	学时数 Total Curriculum Hours				学分 数 Credits	开课 学期 Semester	毕业 要求 Student Outcomes
				总学 时 Class Hours	上机 Computer-ai ded Class Hours	实验 Lab Hours	实践 Practice Hours			
公共基础课 General Basic Courses	143093	思想道德修养与法律基础 Cultivation of Thought and Morals & Fundamental of Law	必修 课 C	(40) (36)				2.5	1	№8
	143091	中国近现代史纲要 Skeleton of Chinese Modern History		(32) 24				2.0	2	№8
	143106	毛泽东思想和中国特色社会主义理论体系概论 Thought of Mao ZeDong and Theory of Socialism with Chinese Characteristics		(80) 48				5.0	3	№8
	143090	马克思主义基本原理 Fundamentals of Marxism Principle		(40) 36				2.5	4	№8
	143094	形势与政策 Analysis of the Situation & Policy		(128)				2.0	1-8	№8
	144001	大学英语 (一) College English(1)		64				4.0	1	№10
	144002	大学英语 (二) College English(2)		64				4.0	2	№10
	145223	大学计算机基础 Foundations of Computer		32				2.0	1	№5
	152001	体育 (一) Physical Education (1)		32			32	1.0	1	№12
	152002	体育 (二) Physical Education (2)		32			32	1.0	2	№12
	152003	体育 (三) Physical Education (3)		32			32	1.0	3	№12
	152004	体育 (四) Physical Education (4)		32			32	1.0	4	№12
	106001	军事理论 Military Principle		(16)				1.0	2	№9
	140191	微积分 II (一) Calculus II(1)		80				5.0	1	№1
	140192	微积分 II (二) Calculus II(2)		80				5.0	2	№1
	140197	线性代数与解析几何 Linear Algebra & Analytic Geometry		48				3.0	1	№1
	140019	概率论与数理统计 Probability & Mathematical Statistics		48				3.0	2	№1
	140015	复变函数 I Complex Variable I		32				2.0	3	№1
	141005	大学物理III (一) General Physics II (1)		64				4.0	2	№1
	141006	大学物理III (二) General Physics II (2)		64				4.0	3	№1
	141007	大学物理实验 (一) Physics Experiment(1)		32		32		1.0	2	№4
	141008	大学物理实验 (二) Physics Experiment(2)		32		32		1.0	3	№4
	130137	画法几何及机械制图 (一) Descriptive Geometry & Machine Drawing (1)		48				3.0	1	№2
	130138	画法几何及机械制图 (二) Descriptive Geometry & Machine Drawing (2)		64				4.0	2	№2
	145268	C++程序设计基础 C++ Programming Foundations		48				3.0	2	№5

	人文科学领域 Humanities	通识课 E	96				6.0		№8
	社会科学领域 Social Science		64				4.0		№8
合 计 Total			1196		64	128	77		

三、专业教学计划表（续）（Teaching Schedule）

类别 Course Category	课程 代码 Course No.	课程名称 Course Title	是否 必修 C/E	学时数 Total Curriculum Hours				学分 数 Credits	开课 学期 Semester	毕业 要求 Student Outcomes
				总学时 Class Hours	上机 Computer-ai ded Class Hours	实验 Lab Hours	实践 Practice			
学科基础课 Disciplinary Basic Courses	135092	电工与电子技术 II Electrical Engineering and Electrontechnics II	必 C	64				4.0	4	№1
	135081	电工与电子技术实验 Experiment of Electrical Engineering and Electrontechnics	必 C	24		24		1.0	5	№4
	133100	理论力学 I Theoretical Mechanics I	必 C	64				4.0	2	№1
	133080	材料力学 III Mechanics of Materials III	必 C	80		6		5.0	3	№1
	130083	机械设计基础 Basis of Mechanical Design	必 C	48				3.0	5	№3
	130310	机械基础综合实验 I Poly-experiment of Mechanical Fundamentals	必 C	10		10		0.5	5	№4
	133238	船舶与海洋工程导论 Introduction to Naval Architecture and Ocean Engineering	必 C	32				2.0	3	№1
	133032	船舶静力学 Ship Statics	必 C	32				2.0	4	№1
	133103	流体力学 Fluid Mechanics	必 C	72				4.5	4	№1
	133239	船舶结构与制图 Hull Structure and Drawing	必 C	48	12			2.5	4	№2
	133035	船舶结构力学 Structural Mechanics for Ships	必 C	64		8		4.0	5	№1
	133304	海洋工程环境 Ocean Engineering Environment	必 C	48				3.0	5	№1
	133037	船舶建造工艺与现代造船技术 Shipbuilding Technology	必 C	48				3.0	6	№3
	133030	船舶设计原理 Design Principle of Ship	必 C	56				3.5	7	№3

类别 Course Category	课程 代码 Course No.	课程名称 Course Title	是否 必修 C/E	学时数 Total Curriculum Hours				学分 数 Credits	开课 学期 Semester	毕业 要求 Student Outcomes
				总学时 Class Hours	上机 Computer-ai ded Class Hours	实验 Lab Hours	实践 Practice			
	133223	船舶工程实验与测试技术 Test and Measurement Method of Ship Engineering	必 C	32		20		1.0	7	№4
	132267	弹性力学 Elastic Theory	选 E	40	8			2.5	5	№1
	133360	塑性力学 Theory of Plasticity	选 E	48				3.0	5	№1
	133073	结构有限元 Finite Element Method in Structural Mechanics	选 E	32	8			2.0	6	№1
	合计 Total		必 C	722	12	68		43.0		
			选 E	选修课修读最低要求 2.0 学分 minimum elective course credits required:2						
专业领域课(船舶工程课组) Specialty-related Courses	133379	船舶阻力 Ship Resistance	必 C	32				2.0	5	№1
	133380	船舶推进 Ship Propulsion	必 C	32				2.0	5	№1
	133283	船舶强度与结构设计 Ship Strength and Structure Design	必 C	48				3.0	6	№3
	133302	船舶振动 Ship Vibration	选 E	32				2.0	6	№1
	133322	船舶工程经济学 Economy of Ship Engineering	选 E	32				2.0	6	№11
	133381	船舶电气与自动控制技术 Marine Electrical and Automatic Control Technology	选 E	32		8		2.0	6	№1
	133260	船舶操纵性与耐波性 Ship Maneuvering and Seakeeping	选 E	32				2.0	7	№1
	133290	计算机辅助船舶设计 Computer Aided Ship Design	选 E	48				3.0	7	№3
	133033	船舶设备 Ship Equipment	选 E	32				2.0	7	№1
	133259	节能船型与节能技术 Energy-Saving Hull Forms and Techniques	选 E	32				2.0	7	№7
	133303	高性能船设计 Design of High Performance Vehicle	选 E	32				2.0	7	№3
	133085	钢结构 Steel Structures	选 E	48				3.0	5	№1
	133471	海洋工程波浪力学 Wave Mechanics for Ocean Engineering	选 E	32				2.0	5	№1

类别 Course Category	课程 代码 Course No.	课程名称 Course Title	是否 必修 C/E	学时数 Total Curriculum Hours				学分 数 Credits	开课 学期 Semester	毕业 要求 Student Outcomes	
				总学时 Class Hours	上机 Computer-ai ded Class Hours	实验 Lab Hours	实践 Practice				
	133461	海洋工程数值分析方法导论 Introduction to Numerical Analysis Methods on Ocean Engineering	选E	32	8			2.0	6	No1	
	133305	海洋工程模型试验技术 Model Test Techniques of Ocean Engineering	选E	32				2.0	7	No4	
	133472	海洋石油开发工艺与设备 Offshore Oil Drilling Technology and Equipment	选E	24				1.5	6	No1	
	133473	海底管线 Subsea Pipeline	选E	32				2.0	6	No1	
	133474	海洋固定式平台 Fixed Offshore Platform	选E	32				2.0	7	No1	
	133475	海洋浮式平台 Floating Offshore Platform	选E	32				2.0	7	No1	
	120003	创新研究训练 Innovation Research Training	选E	32				2.0		No4	
	120004	创新研究实践 I Innovation Research Practice I	选E	32				2.0		No4	
	120005	创新研究实践 II Innovation Research Practice II	选E	32				2.0		No4	
	120006	创业实践 Entrepreneurial Practice	选E	32				2.0		No6	
	合 计 Total		必 C	112				7.0			
			选 E	选修课修读最低要求 14.0 学分 minimum elective course credits required:14.0							
专业领域课(海洋工程课组) Specialty-related Courses	133106	土力学与地基基础 Soil Mechanics and Geotechnical Engineering	必 C	48				3.0	4	No1	
	133474	海洋固定式平台 Fixed Offshore Platform	必 C	32				2.0	7	No1	
	133475	海洋浮式平台 Floating Offshore Platform	必 C	32				2.0	7	No1	
	133085	钢结构 Steel Structures	选 E	48				3.0	5	No1	
	133471	海洋工程波浪力学 Wave Mechanics for Ocean Engineering	选 E	32				2.0	5	No1	
	133472	海洋石油开发工艺与设备 Offshore Oil Drilling Technology and Equipment	选 E	24				1.5	6	No1	

类别 Course Category	课程 代码 Course No.	课程名称 Course Title	是否 必修 C/E	学时数 Total Curriculum Hours				学分 数 Credits	开课 学期 Semester	毕业 要求 Student Outcomes
				总学时 Class Hours	上机 Computer-ai ded Class Hours	实验 Lab Hours	实践 Practice			
				133473	海底管线 Subsea Pipeline	选 E	32			
133305	海洋工程模型试验技术 Model Test Techniques of Ocean Engineering	选 E	32				2.0	7	No4	
133461	海洋工程数值分析方法导论 Introduction to Numerical Analysis Methods on Ocean Engineering	选 E	32	8			2.0	6	No1	
133283	船舶强度与结构设计 Ship Strength and Structure Design	选 E	48				3.0	6	No3	
133379	船舶阻力 Ship Resistance	选 E	32				2.0	5	No1	
133380	船舶推进 Ship Propulsion	选 E	32				2.0	5	No1	
133302	船舶振动 Ship Vibration	选 E	32				2.0	6	No1	
133322	船舶工程经济学 Economy of Ship Engineering	选 E	32				2.0	6	No11	
133381	船舶电气与自动控制技术 Marine Electrical and Automatic Control Technology	选 E	32		8		2.0	6	No1	
133260	船舶操纵性与耐波性 Ship Maneuvering and Seakeeping	选 E	32				2.0	7	No1	
133259	节能船型与节能技术 Energy-Saving Hull Forms and Techniques	选 E	32				2.0	7	No7	
133303	高性能船设计 Design of High Performance Vehicle	选 E	32				2.0	7	No3	
133290	计算机辅助船舶设计 Computer Aided Ship Design	选 E	48				3.0	7	No3	
120003	创新研究训练 Innovation Research Training	选 E	32				2.0		No4	
120004	创新研究实践 I Innovation Research Practice I	选 E	32				2.0		No4	
120005	创新研究实践 II Innovation Research Practice II	选 E	32				2.0		No4	
120006	创业实践 Entrepreneurial Practice	选 E	32				2.0		No6	
		必 C	112				7.0			

类别 Course Category	课程 代码 Course No.	课程名称 Course Title	是否 必修 C/E	学时数 Total Curriculum Hours				学分 数 Credits	开课 学期 Semester	毕业 要求 Student Outcomes
				总学时 Class Hours	上机 Computer-ai ded Class Hours	实验 Lab Hours	实践 Practice			
		合计 Total	选 E	选修课修读最低要求 14.0 学分 minimum elective course credits required:14.0						

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。

四、集中实践教学环节(Practice-concentrated Training)

船舶工程课组

课程 代码 Course No	课程名称 Course Title	是否 必修 C/E	学时数 Total Curriculum Hours		学分数 Credits	开课 学期 Semester	毕业要求 Student Outcomes
			实践 Practice weeks	授课 Lecture Hours			
106002	军训 Military Training	必 C	3 周		3.0	1	№9
143197	马克思主义理论与实践 Marxism Theory and Practice	必 C	2 周		2.0	假期	№8
133210	生产实习 Production practice	必 C	1 周		1.0	3	№11
130356	工程训练 I Engineering Training	必 C	2 周		2.0	4	№3
133268	船舶静力学课程设计 Course Project of Ship Statics	必 C	2 周		2.0	4	№3
130195	机械设计基础课程设计 Course Project of the Basis of Mechanical Design	必 C	2 周		2.0	5	№3
133224	船舶推进课程设计 Course Project of Ship Propulsion	必 C	2 周		2.0	5	№3
133490	海洋工程环境课程设计 Course Project of Ocean Engineering Environment	必 C	1 周		1.0	5	№3
133225	船舶强度课程设计 Course Project of Ship Strength	必 C	2 周		2.0	6	№3
133301	船舶设计原理课程设计 Course Project of Design Principle of Ship	必 C	2 周		2.0	7	№3
133257	毕业实习 Graduate practice	必 C	3 周		3.0	8	№11
133273	毕业设计 Undergraduate Thesis	必 C	15 周		15.0	8	№12
	合计 Total	必 C	37 周		37.0		
		选 E	选修课修读最低要求 0.0 学分 minimum elective course credits required:0.0				

海洋工程课组

课程 代码 Course No	课程名称 Course Title	是否 必修 C/E	学时数 Total Curriculum Hours		学分数 Credits	开课 学期 Semester	毕业要求 Student Outcomes
			实践 Practice weeks	授课 Lecture Hours			
106002	军训 Military Training	必 C	3周		3.0	1	№9
143197	马克思主义理论与实践 Marxism Theory and Practice	必 C	2周		2.0	假期	№8
133210	生产实习 Production practice	必 C	1周		1.0	3	№11
130356	工程训练 I Engineering Training	必 C	2周		2.0	4	№3
133268	船舶静力学课程设计 Course Project of Ship Statics	必 C	2周		2.0	4	№3
130195	机械设计基础课程设计 Course Project of the Basis of Mechanical Design	必 C	2周		2.0	5	№3
133490	海洋工程环境课程设计 Course Project of Ocean Engineering Environment	必 C	1周		1.0	5	№3
133491	海洋能转换与利用模型实验 Model Experiment of Ocean Energy Conversion and Utilization	必 C	2周		2.0	7	№4
133492	固定式平台课程设计 Course Project of Fixed Offshore Platform	必 C	2周		2.0	7	№3
	浮式平台课程设计 Course Project of Floating Offshore Platform	必 C	2周		2.0	7	№3
133257	毕业实习 Graduate practice	必 C	3周		3.0	8	№11
133273	毕业设计 Undergraduate Thesis	必 C	15周		15.0	8	№12
合计 Total		必 C	37周		37.0		
		选 E	选修课修读最低要求 0.0 学分 minimum elective course credits required:0.0				

五、第二课堂

第二课堂由人文素质教育和创新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 2 个学分。

2.创新能力培养基本要求

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或广东省创新创业训练计划或 SRP（学生研究计划）或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。

5. “Second Classroom” Activities

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

1) Basic Requirements of Humanities Quality Education

Besides gaining course credits listed in one’s subject teaching curriculum, a student is required to participate in extracurricular activities of Humanities Quality Education based on one’s interest, acquiring no less than two credits.

2) Basic Requirements of Innovative Ability Cultivation

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