

轮机工程专业 2017 版本本科培养方案

Undergraduate Education Plan for Specialty in Marine Engineering (2017)

专业名称	轮机工程	主干学科	船舶与海洋工程
Major	Marine Engineering	Major Disciplines	Marine and ocean engineering
计划学制	四年	授予学位	工学学士
Duration	4 Years	Degree Granted	Bachelor of Engineering

最低毕业学分规定

Graduation Credit Criteria

课程类别 Course Classification 课程性质 Course Nature	通识教育课程 Public Basic Courses	专业教育课程 Specialized Courses	个性课程 Personalized Course	集中性实践 Practice Courses	课外学分 Study Credit after Class	总学分 Total Credits
必修课 Required Courses	31	69.5	\	29.5	\	170
选修课 Elective Courses	9	21	\	\	10	

一、培养目标与毕业要求

I Educational Objectives & Requirement

(一) 培养目标

本专业培养掌握轮机工程及相关领域的基础理论、专业知识、基本方法和实践技能，“适应能力强、实干精神强、创新意识强”，具有一定国际视野，能够在海洋运输各企事业单位从事轮机操作、管理、维修和船舶建造工作，并基本具备同类船舶二 / 三管轮任职资格的高级技术人才。

学生毕业 5 年左右能达到：

- (1) 有良好的职业素养和社会责任感，有意愿并有能力服务社会；
- (2) 满足国际海员培训、发证和值班标准公约(S9TCW78 / 95)马尼拉修正案和我国海船船员适任标准的要求，具备远洋船舶轮机员任职资格，并在未来具有担任更高级别轮机员的能力；
- (3) 能在船舶运输及海洋工程各企事业单位从事轮机操纵、维修和船舶监修、监造、海事管理、船舶检验等工作；
- (4) 能够在一个设计、生产或科研团队中担任技术骨干或组织管理角色；
- (5) 能够通过继续教育或其它学习渠道更新知识，实现能力和技术水平的提升。

(一) Program Objectives

This major cultivates talents who master basic theory, professional knowledge, basic methods and practical skills of the marine engineering and related fields. Students should be strong adaptable, be able to engage in hard work and have a strong sense of innovation. The elementary class mainly cultivates students to be senior technical talents who can be engaged in turbine operation, management and repair, and ship construction, meanwhile be qualified to be Third/Fourth Engineer Officers of non-generic ships.

1. Have good professionalism and social responsibility, willingness and ability to serve the society.
2. To meet marine engineers who have all professional knowledge of marine engineering, conform with the demands of the provisions of Manila amendments to the international convention on Standards of

Training, Certification and Watch keeping for seafarers, 1998 (STCW78/95) and of Seafarer Training, Examination and Certification in China, be qualified for marine engineer of Ocean Ship, and have the ability to serve as a higher level of engineers in the future.

3. In the shipping and marine engineering enterprises and institutions, the student can be engaged in marine maneuvering, maintaining and supervising ship repairing and building, maritime management, ship survey work etc.
4. Have the ability to serve as a technical backbone or organization management role in a design, production, or research team.
5. Ability and skill level can be improved by continuing education or other learning channels.

(二) 毕业要求

- (1) 热爱社会主义祖国，拥护中国共产党领导，掌握马列主义、毛泽东思想、邓小平理论和科学发展观的基本原理；坚守社会主义核心价值观，具有为海洋强国、海运强国而奋斗的志向和历史责任感；具有爱岗敬业、艰苦奋斗、热爱劳动、遵纪守法、团结合作的优秀品质；具有良好的思想品德、社会公德和职业道德。
- (2) 具有独立获取知识、提出问题、分析问题和解决问题的能力及开拓创新的精神，具有一定的从事本专业业务工作的能力和适应相邻专业业务工作的基本能力与素质。
- (3) 具有一定的体育和军事基本知识，掌握科学锻炼身体的基本技能，养成良好的体育锻炼和卫生习惯，受到必要的军事训练，达到国家规定的大学生体育和军事训练合格标准，具备健全的心理和健康的体魄，能够履行建设祖国和保卫祖国的神圣义务。
- (4) 具备扎实的自然科学基础，掌握高等数学、工程数学、大学物理的基本理论和应用方法。
- (5) 具有较好的人文、社会科学知识和计算机应用能力。
- (6) 具有较好的创新思维和初步的科学研究能力。
- (7) 具备船舶动力装置、机舱辅助设备和甲板机械基本原理及其相关的机械、电气、液压、气动和机电一体化知识，并掌握基本的操作、管理和维护保养技术。
- (8) 具备一定的国际视野和较好的英语水平，能够运用英语进行专业相关的阅读与书写，并在跨文化背景下进行沟通和交流。
- (9) 具有安全与环保意识，熟悉国际海事组织相关公约和国内法律法规，了解行业发展动态，满足 STCW 公约关于值班轮机员在轮机工程、电气电子和控制工程、维护与修理以及船舶作业管理和人员管理四大职能方面的能力要求。
- (10) 掌握文献检索、资料查询的基本方法，具有初步的科学研究和终身学习的能力。
- (11) 通过学校及国家有关主管机关规定的考试和评估并具备要求的海上资历后，具有海船三管轮履职能力。
- (12) 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。

(一) Outcome Requirements

1. Have ardent love for our socialist country; support the Chinese Communist Party; have a solid understanding of the principles of Marxism and Leninism, Mao Zedong Thought and Deng Xiaoping Theory; adhere to the Core Socialist Values, with the ambition and historic sense of responsibility to fight for constructing China into a marine and marine transportation power; with the spirit of dedication, hard work, love of labor, law-abiding, unity and cooperation; with good ideological, social and professional morality.
2. Be able to acquire knowledge, raise, analyze and solve problems independently; have pioneering and initiative spirit; be able to accomplish tasks in their own fields and perform similar job duties.
3. Possess basic knowledge of physical and military cultures; master basic skills of physical exercises; meet the requirements of physical and military training; be psychologically and physically healthy;

- be able to fulfill the obligations of building and safeguarding the nation..
4. Possess the basic theories of natural science knowledge, Master the basic theories and application methods of higher mathematics, engineering mathematics and University Physics.
 5. Have good knowledge of humanities, social science and computer application.
 6. With good innovative thinking and preliminary scientific research ability.
 7. Possess the basic theories of marine power plant, engine room auxiliary equipment, deck machinery and the knowledge of related mechanical, electrical, hydraulic, pneumatic, mechanical and electrical integration, and master the basic skills of operation, management and maintenance.
 8. Have a certain international perspective and a good command of the English, and be able to read and write in English, and to communicate in a cross-cultural context.
 9. Be with a sense of safety and environmental protection; be familiar with the relevant conventions of the International Maritime Organization and domestic laws and regulations; understand the dynamic development of the industry; and meet the capacity requirements of STCW Convention for the engineers on duty on the four major functions --- marine engineering, electrical and electronic and control engineering, maintenance and repair, and ship operations management and personnel management.
 10. Master the basic methods of document retrieval and data query, and have the ability of preliminary scientific research and lifelong learning.
 11. Have the capability of carrying out the duties of the fourth engineer, after passing the examinations and assessments stipulated by the relevant competent authorities of the school and the state, and having the required maritime qualifications.
 12. Be able to undertake the role of individuals, team members, and leaders in a team of various disciplines.

附：培养目标实现矩阵

	培养目标 1	培养目标 2	培养目标 3	培养目标 4	培养目标 5
毕业要求 1	√				
毕业要求 2				√	
毕业要求 3		√			
毕业要求 4					√
毕业要求 5	√				
毕业要求 6				√	√
毕业要求 7		√	√		
毕业要求 8		√	√		
毕业要求 9		√	√		
毕业要求 10					√
毕业要求 11		√			
毕业要求 12				√	

二、专业核心课程与专业特色课程

II Core Courses and Characteristic Courses

(一) 专业核心课程:

船舶柴油机, 船舶辅机, 船舶电气设备与系统, 轮机自动化, 轮机维护与修理, 船舶管理, 轮机英语。

Core Courses: Marine Diesel Engine, Marine Auxiliary Machinery, Marine Electric Equipment and

System, Marine Machinery Automation, Marine Machinery Maintenance and Repair, Ship Management, English of Marine Engineering.

(二) 专业特色课程:

船舶防污染技术, 轮机自动化系统微机应用, 船舶电站自动控制系统与管理, 船舶电气管理工艺学。

Characteristic Courses: Marine Oily Handling and Pollution Prevention, Application of Microcomputer in Marine Engineering, Auto-control System and Management of Marine Power Station, Management Process of Marine Electric Equipment.

附: 毕业要求实现矩阵:

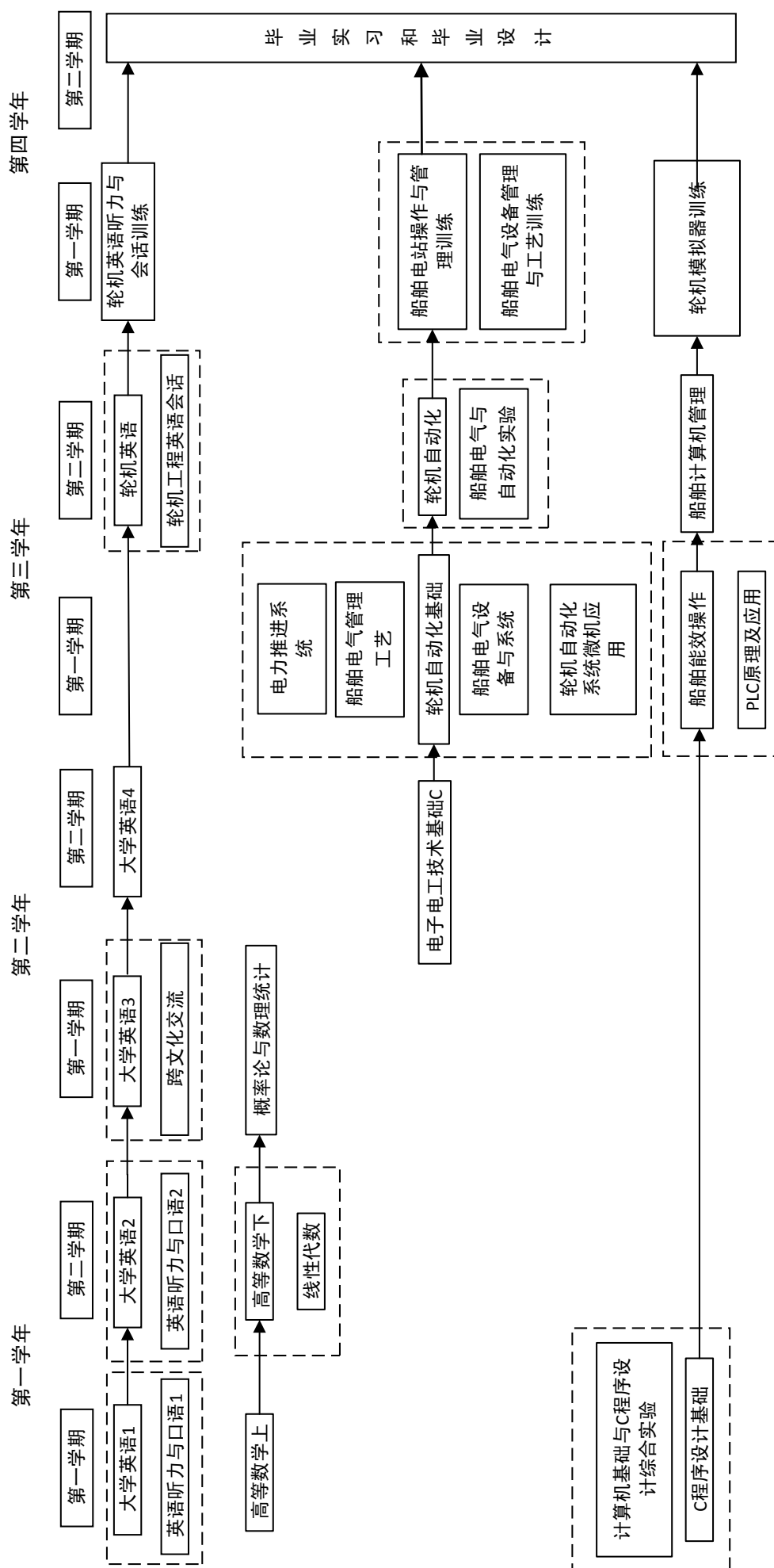
专业 核心 课程	专业 特色 课程	课程名称	轮机工程专业毕业要求											
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		思想道德修养与法律基础	√				√							
		中国近现代史纲要	√											
		毛泽东思想和中国特色社会主义理论体系概论	√											
		马克思主义基本原理	√				√							
		军事理论	√		√									
		航海体育			√									
		大学英语								√				
		C 程序设计基础					√							
		计算机基础与 C 程序设计综合实验					√							
		英语听力与口语								√				
		专业导论	√								√			
		工程图学				√	√							
		高等数学				√								
		线性代数				√								
		大学物理				√								
		物理实验				√								
		轮机工程基础									√			
		流体力学				√		√						
		工程力学				√		√						
		工程力学实验						√				√		

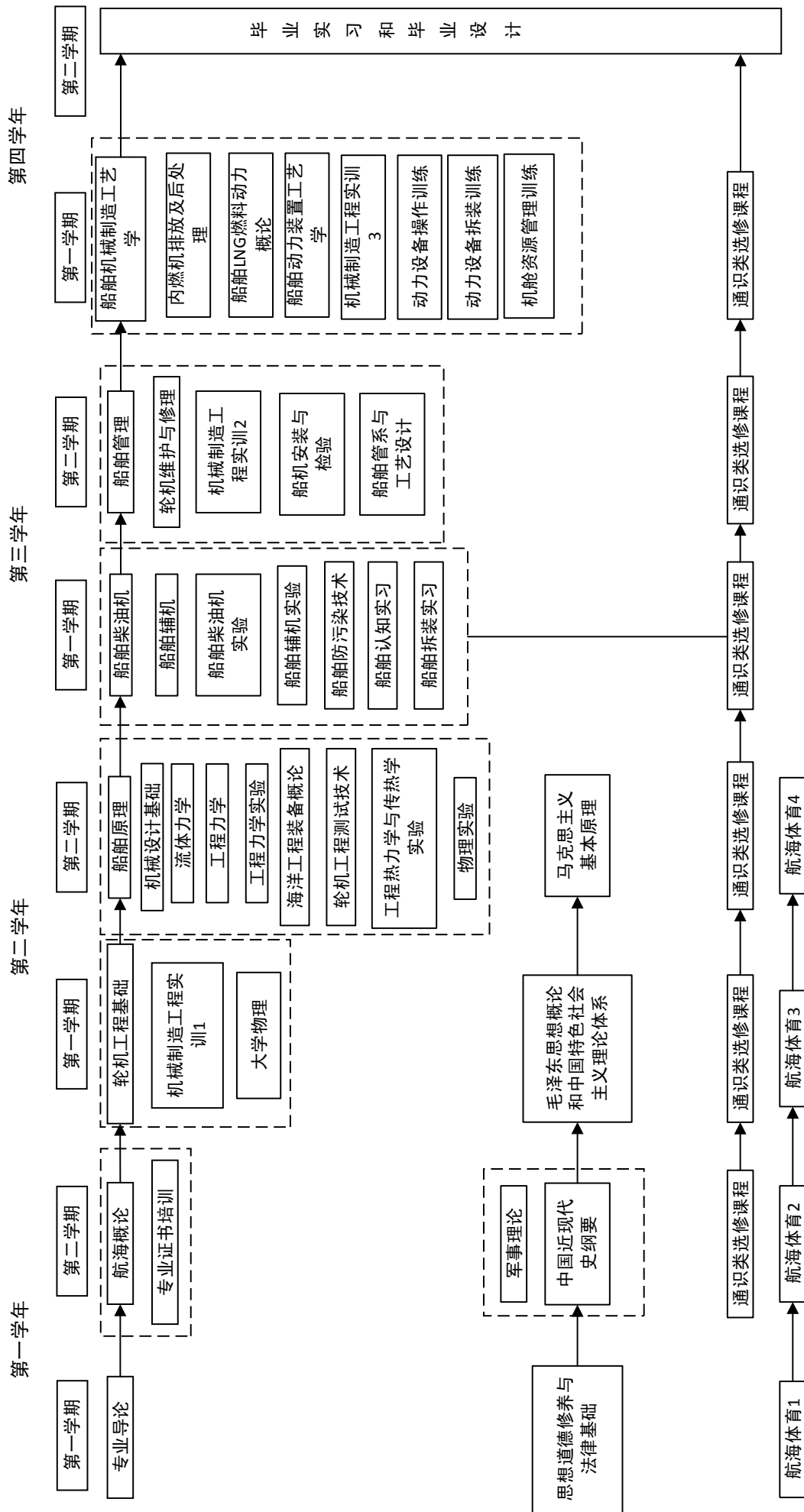
专业 核心 课程	专业 特色 课程	课程名称	轮机工程专业毕业要求											
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		机械设计基础				√	√							
		电工与电子技术基础		√							√			
		工程热力学与传热学		√								√		
		工程热力学与传热学实验				√								
		轮机自动化基础					√	√						
√		船舶柴油机							√		√			
		船舶柴油机实验							√		√			
√		船舶辅机							√		√			
		船舶辅机实验							√		√			
√		船舶电气设备与系统							√		√			
√		轮机自动化						√	√		√	√		
		船舶电气与自动化实验						√				√		
√		轮机英语								√				
√		轮机维护与修理							√		√			
√		船舶管理							√		√			√
		航海概论			√						√			
		概率论与数理统计		√		√								
		跨文化交流					√							
		海洋工程装备概论		√							√			
		轮机工程测试技术						√				√		
		船舶原理		√					√					
		PLC 原理及应用					√	√						
		船舶能效操作						√			√			
√		船舶电气管理工艺学							√		√			
√		船舶防污染技术									√			
		电力推进系统		√					√		√			
√		轮机自动化系统微机应用					√					√		

专业 核心 课程	专业 特色 课程	课程名称	轮机工程专业毕业要求											
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		船舶计算机管理					√							
		轮机工程英语会话								√			√	√
	√	船舶电站自动控制系统与管理		√					√		√			
		船舶管系与工艺设计							√		√			
		船机安装与检验							√		√			
		动力机械监测与控制							√		√			
		内燃机排放及后处理							√		√			
		船舶机械制造工艺学							√		√			
		船舶 LNG 燃料动力概论		√					√					
		船舶动力装置工艺学							√		√			
		军事训练	√		√									
		专业证书培训											√	√
		柴油机拆装实习							√				√	√
		船舶认识实习			√									√
		机械制造工程实训							√				√	
		动力设备操作训练							√				√	
		动力设备拆装训练							√				√	
		船舶电站操作与管理训练							√		√		√	
		船舶电气设备管理与工艺训练							√		√		√	
		机舱资源管理训练									√	√	√	
		轮机英语听力与会话训练								√			√	√
		轮机模拟器训练								√			√	√
		毕业实习和毕业设计		√		√	√	√	√			√		√

三、 课程教学进程图

III Teaching Process Map





四、 理论教学建议进程表

IV Theory Course Schedule

课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议 修读 学期 Suggested Term	先修课程 Prerequisite Course
			总学时 Tot hrs.	实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur		
(一) 通识教育必修课程 General Education Required Courses									
4220001111	思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law	3	48			8		1	
4220002111	中国近现代史纲要 Outline of Contemporary and Modern Chinese History	2	32					2	
4220003111	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics	4	96			32		3	
4220005111	马克思主义基本原理 Marxism Philosophy	3	48			8		4	
1060003131	军事理论 Military Theory	1	32				16	2	
4210005171	航海体育 1 Physical Education I	1	26					1	
4210006171	航海体育 2 Physical Education II	1	34					2	
4210007171	航海体育 3 Physical Education III	1	34					3	
4210008171	航海体育 4 Physical Education IV	1	34					4	
4030002181	大学英语 1 College English I	3	60				12	1	
4030003181	大学英语 2 College English II	2	44				12	2	大学英语 1
4030004181	大学英语 3 College English III	2	44				12	3	大学英语 2
4030004181	大学英语 4 College English IV	2	44				12	4	大学英语 3
4120335171	C 程序设计基础 C Language Programming	2	32					2	
4120336171	计算机基础与 C 程序设计综合实验 Foundations of Computer and C Language Programming Experiments	1	32		32			2	
4030162111	英语听力与口语 B 上 English Listening and Speaking I	1	16					1	
4030163111	英语听力与口语 B 下 English Listening and Speaking II	1	16					2	英语听力与口语 1
小 计 Subtotal		31	672	0	32	48	64		
(二) 通识教育选修课程									

课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议 修读 学期 Suggested Term	先修课程 Prerequisite Course
			总学时 Tot hrs.	实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur		
General Education Elective Courses									
创新创业类 Innovation and Entrepreneurship Courses		要求至少取得 9 个学分，且必须选修艺术体育类课程中的艺术类相关课程并取得至少 2 个学分，在创新创业类课程中至少选修一门课程，在人文社科类或经济管理类课程中至少选修一门。 Students are required to obtain at least 9 credits, which must cotain art courses of 2 credits from the category of Art and Physical Education Courses,at least one course from the category of Innovation and Entrepreneurship Courses, and at least one course from the category of Arts and Social Science Courses or the category of Economy and Management Courses.							
人文社科类 Arts and Social Science Courses									
经济管理类 Economy and Management Courses									
科学技术类 Science and Technology Courses									
艺术体育类 Art and Physical Education Courses									
(三) 专业教育必修课程 Basic Disciplinary RequiredCourses									
4150094111	专业导论 Introduction to Marine Engineering Physics	1	16					1	
4180269171	工程图学 B Engineering Graphics	3.5	72				16	1	
4050063111	高等数学 A 上 Advanced Mathematics I	5	80					1	
4050064111	高等数学 A 下 Advanced Mathematics II	5	80					2	
4050229111	线性代数 Linear Algebra	2.5	40					2	高等数学上
4150267111	轮机工程基础 Foundation of marine Engineering	2	32					3	
4050463131	大学物理 B Physics	5	80					3	
4050224111	物理实验 B Physics Experiments	1	32	32				4	
4140129111	流体力学 D Fluid Mechanics	2	32	6				4	
4140077111	工程力学 B Engineering Mechanics	4	64					4	
4140078111	工程力学 B 实验 Mechanics Experiments	0.5	16	16				4	
4180031111	机械设计基础 Foundation of Mechanical design	3.5	56	6				4	
4100012111	电工与电子技术基础 C Foundation of Electrical Engineering & Electric Technology	4	64	10				4	
4150226171	工程热力学与传传热学 B Thermodynamics for Engineering and Heat Transfer	3.5	56					4	

课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议 修读 学期 Suggested Term	先修课程 Prerequisite Course
			总学时 Tot hrs.	实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur		
4150227171	工程热力学与传热学实验 Thermodynamics for Engineering and Heat Transfer Experiment	0.5	16	16				4	
4150065111	轮机自动化基础 Foundation of Marine Engineering Automation	2	32	4				5	
4150228171	船舶柴油机 A Marine Diesel Engine	3.5	56					5	
4150229171	船舶柴油机实验 Marine Diesel Engine Experiment	0.5	16	16				5	
4150230171	船舶辅机 A Marine Auxiliary Machinery	4.5	72					5	
4150231171	船舶辅机实验 Marine Auxiliary Machinery Experiment	0.5	16	16				5	
4150232171	船舶电气设备与系统 B Marine Electric Equipment and System	3.5	56					5	
4150234171	轮机自动化 B Marine Engineering Automation	3	48					6	
4150235171	船舶电气与自动化实验 Experiment of Marine Electrical and Marine Machinery Automation	0.5	16	16				6	
4150236171	轮机英语 Marine Engineering English	3	48					6	
4150062111	轮机维护与修理 Marine Machinery Maintenance and Repair	2	32	6				6	
4150198131	船舶管理 C Ship Management	3.5	56					6	
小 计 Subtotal		69.5	1184	144	0	0	16		
(四) 专业教育选修课程 Specialized Elective Courses									
4160035111	航海概论 Introduction to Navigation	1.5	24					2	
4050058111	概率论与数理统计 B Probabilities Theory and Mathematics Statistic	3	48					3	
4150055111	跨文化交流 Intercultural Communication	1.5	24					3	
4150237171	海洋工程装备概论 B Introduction to Marine Engineering Equipment	1.5	24					4	
4150057111	轮机工程测试技术 Measurement and Test Technique of Marine Engineering	1.5	24	4				4	

课程编号 Course Number	课 程 名 称 Course Title	学分 Crs	学时分配 Including					建议 修读 学期 Suggested Term	先修课程 Prerequisite Course
			总学时 Tot hrs.	实验 Exp.	上机 Ope- ration	实践 Prac- tice	课外 Extra- cur		
4140034111	船舶原理 D Ship Principle	1.5	24					4	
4150001111	PLC 原理及应用 Principle & Application of PLC	2	32	4				4	
4150238171	船舶能效操作 Ship Energy Efficient Operation	1	16					4	
4150009111	船舶电气管理工艺 Management Process of Marine Electric Equipment	1	16					5	
4150239171	船舶防污染技术 A Marine Pollution Prevention Technology	2	32					5	
4150037111	电力推进系统 Electric Propulsion System	1.5	24					5	
4150066111	轮机自动化系统微机应用 Application of Microcomputer in Marine Engineering Automation System	2	32	4				5	
4150027111	船舶计算机管理 Shipboard Computer Management	1.5	24		12			6	
4150058111	轮机工程英语会话 Oral English of Marine Engineering	1.5	24					6	
4150013111	船舶电站自动控制系统与管理 Auto-control System and Management of Marine Power Station	2	32					6	
4150240171	船舶管系与工艺设计 C Design of Ship Piping System and Process	2	32					6	
4150241171	船机安装与检验 Installation and Inspection of Marine Machinery	2	32					6	
4150242171	动力机械监测与控制 Power Machine Condition Monitoring & Fault Diagnoses	2	32	4				6	
4150134121	内燃机排放及后处理 B Intercultural Communication Engine Emissions and After-treatment Technology	2	32	4				7	
4150253171	船舶机械制造工艺学 C Marine Machinery Manufacture Technology	2	32	4				7	
4150199131	船舶 LNG 燃料动力概论 Introduction to the LNG Marine Power	2	32					7	
4150244171	船舶动力装置工艺学 Marine Power Plant Installation Technology	3	48	2				7	
小 计 Subtotal		40	640	22	12	0	0		
修读说明：要求至少选修 21 学分。 NOTE: Minimum subtotal credits:21.									

五、集中性实践教学环节

V Practice Schedule

课程编号 Course Number	实践环节名称 Practice Courses Name	学分 CrS	周数 Weeks	建议修读学期 Suggested Term
1060002111	军事训练 Military Training	1.5	3	1
4160224171	专业证书培训 Training for Certificates	3	6	2(暑假)
4150101111	柴油机拆装实习 Diesel Engine Dismantling and Installation Practice	2	2	5
4150245171	船舶认识实习 Vessel Recognized Practice	2.5	2.5	5
4180112111	机械制造工程实训 A1 Machinery Manufacturing Engineering Practice I	2	2	3
4180135111	机械制造工程实训 A2 Machinery Manufacturing Engineering Practice II	3	3	6
4180139111	机械制造工程实训 A3 Machinery Manufacturing Engineering Practice III	1	1	7
4150151121	动力设备操作训练 Auxiliary Machinery Operation Training	1	1	7
4150152121	动力设备拆装训练 Auxiliary Machinery Dismantling and Installation Training	1	1	7
4150153121	船舶电站操作与管理训练 Operation and Management of Marine Power Station Training	1	1	7
4150154121	船舶电气设备管理与工艺训练 Management and Techniques of Marine Electrical Equipment Training	1	1	7
4150150121	机舱资源管理训练 Engine Room Resource Management Training	0.5	0.5	7
4150146121	轮机模拟器训练 B Marine Engineering Simulator Training	1	1	7
4150246171	轮机英语听力与会话训练 B Training for Marine Engineering	0.5	0.5	7
4150247171	毕业实习和毕业设计 Practice or Design for Graduation	8.5	17	8
小 计 Subtotal		29.5	42.5	

六、其它要求

VI Recommendations on Course Studies

- 1、《形势与政策》和《心理健康教育》课程为课外必修课程，分别计 2 个和 1 个课外学分。
 - 2、学生选修的通识选修课程和从学校发布的个性课程目录中选修的个性课程，要求与本专业培养方案内设置的课程内容不重复。
- 1.Situation & Policy (2 credits) and Mental Health Education (1 credit) are the required extracurricular courses.
 - 2.The selected General Education Elective Courses and Personalized Elective Courses from the courses program by university must be different from the major undergraduate education plan in content.

学院教学责任人：杨志勇
专业培养方案责任人：毛小兵