

# 车辆工程

## Vehicle Engineering

专业代码：080306      学 制：4 年

Program Code: 080306      Duration: 4 years

### 培养目标：

培养坚持社会主义道路，具有坚实工科基础理论、扎实汽车工程领域知识、杰出的创新与实践能力、宽广的国际视野，能在知名国内外研发机构、企事业单位从事汽车整车性能集成、零部件研发的科学研究、工程技术、管理工作，适应国家与社会发展需求的具有领导力的创新型复合人才。

### Educational Objectives:

Cultivate students with strong belief of socialism, solid knowledge of fundamental theory in automotive engineering, outstanding innovation and practical ability, and broad global visions. Graduates are able to work in well-known domestic and foreign R&D institutions, enterprises and institutions, and take duties such as scientific research, engineering technology, and management in the integration of vehicle performance and components. To meet the demand of national economy development, graduates can take the role of the senior comprehensive professional talents.

### 毕业要求：

**1.工程知识：**掌握扎实的工科基础知识，能够将数学、自然科学、机械专业基础知识和汽车专业知识用于解决复杂工程问题。

№1.1 掌握数学、自然科学、工程基础和专业基础知识解释复杂工程问题

№1.2 能够运用数学、自然科学、工程基础和专业基础知识建立正确的数学、力学模型。

№1.3 掌握扎实的汽车与机械基础知识，了解汽车产业基本运营模式，解决汽车行业复杂工程问题。

**2.问题分析：**能够应用数学、自然科学、工程科学的基本原理、方法和手段，识别、表达、并通过文献研究分析复杂工程问题，以获得有效结论。

№2.1 能够应用数学、自然科学和工程科学的基本原理，识别、表达复杂机械工程问题。

№2.2 能够应用数学、自然科学和工程科学的基本原理、方法和手段，并通过文献研究分析汽车行业复杂工程问题，以获得有效结论。

**3.设计/开发解决方案：**能够设计针对复杂工程问题的解决方案，设计满足特定需求的汽车生产/开发中的系统、零部件或工艺流程，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。

№3.1 能够设计针对复杂机械工程问题的解决方案。

№3.2 能够对机械工程设计方案进行比较、优化和开发，在设计环节中具有创新意识。

№3.3 能够设计满足特定需求的汽车生产/开发中的系统、零部件或工艺流程，考虑社会、健康、安全、法律、文化以及环境等因素。

**4.研究：**能够基于科学原理并采用科学方法对复杂机械工程问题进行研究，包括设计实验、分析与解释数据，并通过信息综合针对汽车行业需求得到合理有效的结论。

№4.1 能够基于科学原理并采用科学方法，设计实验对复杂机械工程问题进行研究。

№4.2 能够基于科学原理并采用科学方法，分析与解释试验数据、并通过信息综合得到合理有效的结论，完成对汽车行业相关复杂工程问题进行研究。

**5.使用现代工具：**能够针对复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息工具，包括对复杂工程问题的预测与模拟，并能够理解其局限性。

№5.1 能够对复杂机械工程问题进行预测与模拟，并能够理解其局限性。

№5.2 能够针对汽车生产或研发中的复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息工具。

**6.工程与社会：**能够基于车辆工程相关背景知识和相关法规标准进行合理分析，评价工程实践和复杂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。

№6.1 能够基于机械工程相关背景知识进行合理分析，评价机械工程实践和复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响。

№6.2 理解车辆工程实践和复杂汽车行业工程问题解决方案对社会、健康、安全、法律以及文化应承担的责任。

**7.环境和可持续发展：**能够理解和评价针对汽车行业相关复杂工程问题的工程实践对环境、社会可持续发展的影响。

№7.1 理解新材料、新工艺、新方法在机械工程实践中的应用，评价其对环境、社会可持续发展的影响。

№7.2 能够理解、评价汽车行业相关复杂工程问题的工程实践对环境、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。

№8.1 学习人文和社会科学及其思政系列课程，具有人文社会科学素养、坚定的理想信念和社会责任感。

№8.2 了解基本的职业道德和规范，并认识其重要性；在专业实践和实习过程中，遵守工程师职业道德，并能对工程实践活动的社会道德进行判断和评鉴，并履行责任。

**9.个人和团队：**能够在多学科背景下的汽车生产/研发团队中承担个体、团队成员以及负责人的角色。

№9.1 能认识团队协作的重要性，具有团队协作意识和能力，通过军训、分组实验和报告等培养学生能正确对待作为个体、团队成员和负责人的角色。

№9.2 具有跨领域的综合能力，适应多学科背景下的汽车生产/研发团队协作机制。

**10.沟通：**能够就汽车生产研发的复杂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。

№10.1 能够就汽车行业相关复杂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、清晰表达或回应指令。

№10.2 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：**理解并掌握汽车产业的工程管理原理与经济决策方法，并能在多学科环境中应用。

№11.1 掌握基本的工程管理原理和经济决策方法，能对机械工程领域的新工艺、新材料和新设备进行技术分析和比较。

№11.2 多学科环境下，能根据市场、用户需求及技术发展的变化，在汽车相关行业工程项目中具有一定的组织、管理和领导能力。

**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。

№12.1 具有良好的身体素质，认同终身教育和持续教育理念，自觉学习外语，能利用现代技术手段跟踪并获取信息，具有适应专业领域新技术发展的能力。

№12.2 具有良好的心理素质，具有较强的适应能力，能灵活应对新的人际和职场环境，具备不断学习和适应发展的能力。

## **Student Outcomes:**

**№1. Engineering knowledge:** A solid foundation in fundamental engineering knowledge, capable of solving complex engineering problems by applying mathematics, natural sciences, fundamental mechanical knowledge and automotive engineering expertise.

№1.1 Mastery of interpreting complex engineering problems by using mathematics, natural sciences, engineering foundations, and specified expertise.

№1.2 Capable of applying mathematics, natural sciences, engineering foundations, and specified expertise to establish correct mathematical and mechanics models.

№1.3 Mastery of solid automotive and mechanical fundamental knowledge, good understanding of operating modes of automotive industry, capable of solving complex engineering problem in automotive industry.

**№2. Problem Analysis:** Capable of applying fundamental principles and approaches of mathematics, natural sciences, and engineering science to recognize, represent and interpret complex engineering problems through literature review, and therefore draw effective conclusions.

№2.1 Capable of applying fundamental principles and approaches of mathematics, natural sciences, and engineering science to recognize and represent complex mechanical engineering problems

№2.2 Capable of applying fundamental principles and approaches of mathematics, natural sciences, and engineering science to recognize, represent and interpret complex engineering problems in automotive industry through literature review, and therefore draw effective conclusions.

**№3. Design/Development Solutions:** Ability to design solutions for complex engineering problems, design systems, components or processes for automotive production/development that meet specific needs, and reflect innovation in the design process, considering social, health, safety, legal, cultural and environmental factors.

№3.1 Ability to design solutions for complex mechanical engineering problems,

№3.2 Ability to compare, optimize and develop mechanical engineering designs with innovative awareness in the design process

№3.3 Ability to design components or processes for automotive production/development that meet specific needs, and consider social, health, safety, legal, cultural and environmental factors.

**№4. Research:** Ability to study complex mechanical engineering problems based on scientific principles and scientific methods, including designing experiments, analyzing and interpreting data, and obtaining reasonable and effective conclusions for the automotive industry through information integration.

№4.1 Ability to design experiments to solve complex mechanical engineering problems based on scientific principles and using scientific methods.

№4.2 Ability to analyze and interpret data base on scientific principles and scientific methods, and obtain reasonable and effective conclusions to study complex engineering problems in the automotive industry.

**№5. Applying Modern Tools:** Develop, select and use the suitable technologies, resources, modern engineering tools and information technology tools for complex engineering problems, including predictions and simulations of complex engineering problems, and understand their limitations.

№5.1 Ability to predict and simulate complex mechanical engineering problems and understand their limitations.

№5.2 Ability to develop, select and use the suitable technologies, resources, modern engineering tools and information technology tools for complex engineering problems in automotive manufacturing and development.

**№6. Engineering and Society:** Ability to conduct a rational analysis based on automotive engineering related background knowledge and relevant regulatory standards, evaluate the impact of engineering practices and complex problem solutions on society, health, safety, law and culture, and understand the responsibilities.

№6.1 Ability to conduct a rational analysis based on mechanical engineering related background knowledge, evaluate the impact of mechanical engineering practices and complex engineering problem solutions on society, health, safety, law and culture.

№6.2 Understand the responsibility of automotive engineering practices and complex engineering solutions for automotive industries to society, health, safety, law and culture.

**№7. Environment and Sustainable Development:** Ability to understand and evaluate the impact of engineering practices for complex engineering problems in the automotive industry on environmental and social sustainability.

№7.1 Understand the application of new materials, new processes and new methods in mechanical engineering practice, and evaluate their impact on environmental and social sustainable development.

№7.2 Ability to understand and evaluate the impact of engineering practices for complex engineering problems in the automotive industry on environmental and social sustainability.

**№8. Professional Standards:** Possess humanities and social science literacy and social responsibility, understand and abide by engineering professional ethics and norms, and fulfill responsibilities in engineering practice.

№8.1 Study humanities and social sciences and their ideological and political series courses, possess humanities and social science literacy, solid ideal and faith, and social responsibility.

№8.2 Understand basic professional ethics and norms and recognize their importance; in the professional practice and internship process, observe the professional ethics of engineers, and judge and evaluate the social ethics of engineering practice activities, and fulfill their responsibilities

**№9. Individuals and Teams:** Ability to take the roles of individuals, team members and team leader in an automotive production/development team in a multidisciplinary context.

№9.1 Ability to understand the importance of teamwork, possess teamwork awareness. Through military training, group experiments and reports to train students to correctly treat different roles as individuals, team members and team leader.

№9.2 Comprehensive cross-disciplinary capabilities to adapt to automotive production/R&D team collaboration mechanisms in a multidisciplinary context.

**№10. Communication:** Ability to effectively communicate with industry peers and the public on complex engineering issues related to automotive production, including writing reports and design contributions, presenting statements, articulating or responding to instructions. Possess a certain international perspective and can communicate in a cross-cultural context.

№10.1 Ability to effectively communicate with industry peers and the public on complex engineering issues related to automotive production, including writing reports and design contributions, presenting statements, articulating or responding to instructions.

№10.2 Possess a certain international perspective and can communicate in a cross-cultural context.

**№11. Project Management:** Understand and master the engineering management principles and economic decision-making methods of the automotive industry, and apply them in a multidisciplinary environment.

№11.1 Ability to understand basic engineering management principles and economic decision-making

methods, and analyze and compare new technologies, new materials and new equipment in the field of mechanical engineering.

№11.2 In a multi-disciplinary environment, possess certain organizational, management and leadership skills in automotive-related industry projects based on changes in market, user needs and technological developments.

**№12. Lifelong learning:** Awareness of self-directed learning and lifelong learning, with the ability to continuously learn and adapt to development.

№12.1 Have a good physical quality, recognize the concept of lifelong education and continuing education, consciously learn foreign languages, can use modern technology to track and obtain information, and have the ability to adapt to the development of new technologies in the professional field.

№12.2 Possess good psychological quality, strong adaptability, flexibility to cope with new interpersonal and workplace environments, and the ability to continuously learn and adapt to development.

## **专业简介:**

车辆工程专业从 1972 年开始第一届招生,是国内最早涉足车辆工程人才培养和汽车科学技术研究的几所院校之一,车辆工程专业隶属于机械工程一级学科,拥有汽车零部件技术国家地方联合工程实验室、广东省重点实验室、广东省汽车检测工程技术中心,由广东省珠江人才计划领军人才、新世纪优秀人才等组成的教学科研队伍使得车辆工程专业一直保持良好的发展。车辆工程培养从事车辆设计、制造、实验研究以及经营管理等工作,同时具有家国情怀和全球视野的“三创型”(创新、创造、创业)高级工程技术人才。学生系统掌握车辆工程的基础理论,基本技能以及所需的专业知识,初步具备综合运用所学知识分析和解决车辆工程实践中遇到的研究、运用、规划、设计制造及实验等问题的能力。

## **Program Profile:**

Vehicle engineering from the beginning of the first enrollment in 1972, is the first involved in vehicle engineering personnel training and automotive science and technology research one of several institutions; and the vehicle engineering program is affiliated to the first-level discipline of mechanical engineering. It has the national and local joint engineering laboratory of auto parts technology, the key laboratory of Guangdong Province, and the technology center of Guangdong Province on automobile inspection. The program is in a great shape with an outstanding staff team including leading talents of the pearl river talent program and experts of outstanding talents in the new century program. This program are expected to train students to be advanced technical personnel with the "three innovations" (innovation, creation, entrepreneurship), patriotism and global visions. Graduates of this program are supposed to take duties such as design, manufacturing, testing and management in automotive industry. Students should systematically learn knowledge of vehicle engineering including fundamental theory, basic skills and required professional expertise. Necessary trainings of modern automotive engineers will also be taught to students. With these trainings, students are able to apply knowledge to analyze and solve issues in research, application, planning, design and manufacturing.

## **专业特色:**

建立广东省大学生创新创业训练基地（方程式赛车），以教促学、竞教结合，提高学生理论结合实际的能力；面向国内大中型汽车生产厂家的研发、设计、制造部门的人才需求，专业特色课程与教学实践环节有机结合，扩展学生的知识面、培养学生的实践创新能力和创业能力。

## **Program Features:**

With the purpose of combining of teaching and learning, promoting learning with teaching, the training basement of innovation and entrepreneurship for college students in Guangdong Province (Formula Racing) was built to improve students' ability of combining theory and practice. Graduates of this program will mostly start their career in different units such as development, design and manufacturing of large or mid-size automotive companies. The combination of professional courses and practical aspects of the program is helpful to expand the students' knowledge and cultivate students' practical ability and practical ability to innovate.

**授予学位:** 工学学士学位

**Degree Conferred:** Bachelor of Engineering

## **核心课程:**

理论力学、材料力学、机械原理、机械设计、汽车构造、测试技术、发动机原理、汽车理论、汽车设计、汽车制造工程学

## **Core Courses:**

Theoretical Mechanics, Mechanics of Materials, Theory of Machines and Mechanism, Mechanical Design, Automobile Structure, Measurement and Test Technique, Mechanical Vibrations, Theory of Automotive Engine, Fluid Mechanic and Hydraulic Transmission, Theory of Automobile, Vehicle Design, Automotive Manufacturing Engineering

## **特色课程：**

**新生研讨课：** 自动驾驶与智能网联汽车技术、太阳能电池制造技术与应用实践、城市公共安全与人文精神、内燃机结构创新设计、高端产品及其先进制造、增材制造（3D 打印）及精密连接技术、轻工自动装备的未来与挑战

**专题研讨课：** 汽车导论

**双语/全英课程：** 测试技术，汽车有限元法

**学科前沿课：** 电动汽车动力系统设计基础、车用燃料电池技术

**校企合作课：** 汽车制造工程学、汽车设计、汽车构造、机械振动

**竞教结合：** 汽车构造、汽车理论、汽车设计、测试技术

**创新实践课：** 科技文献检索、专业课程设计

**创业教育课程：** 汽车工业产业模式与创业、汽车营销（三个一）

## **Featured Courses:**

### **Freshmen Seminars:**

An Introduction to Unmanned Vehicle and Intelligent Connected Vehicle

Solar Cell Manufacture Technology and Application Practice

City Public Security and Humanistic Spirit

Innovating Design on Structure of Internal-Combustion Engine

High-end Products and Advanced Manufacturing

Additive Manufacturing (3D Printing) and Precision Joining Technology

Opportunity and Challenge for Automatic Equipment in Light Industry

### **Special Topics:**

Introduction of Vehicle Engineering

### **Courses Taught in English:**

Measurement and Test Technique, Automobile Finite Element Method

### **Subject Frontiers Courses:**

Power System Design Basis of Electric Vehicle, Vehicle Fuel Cell Technology

### **Cooperative Courses with Enterprises:**

Automotive Manufacturing Engineering, Vehicle Design, Automobile Structure, Mechanical Vibration

### **Contest-Teaching Integrated Courses:**

Automobile Structure, Theory of Automobile, Vehicle Design, Measurement and Test Technique

### **Innovation Practice:**

Scientific Literature Search, Special training of automotive design

### **Entrepreneurship Courses:**

Models of Automotive Industry and Entrepreneurship, Automotive Marketing



## 一、各类课程学分登记表 (Registration Form of Curriculum Credits)

### 1. 学分统计表 (Credits Registration Form)

课程类别 Course Category	课程要求 Requirement	学分 Credits	学时 Academic Hours	备注 Remarks
公共基础课 General Basic Courses	必修 Compulsory	66.5	1292	
	通识 General Education	10	160	
专业基础课 Specialty Basic Courses	必修 Compulsory	42.5	712	
选修课 Elective Courses	选修 Elective	15.5	248	
合计 Total		134.5	2412	
集中实践教学环节 (周) Practice Training (Weeks)		35.5	35.5 周	
毕业学分要求 Credits Required for Graduation		134.5+35.5=170		

备注：毕业学分要求格式：合计学分+集中实践教学环节学分=毕业学分要求

### 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
2412	2164	248	2034	378	1	154.5	25.5	35.5	122.5	12	13.5

注：1. 通识课计入选修一项中；

2. 实验教学包括“专业教学计划表”中的实验、实习和其他；

3. 创新创业教育学分：培养计划中的课程，由各学院教学指导委员会认定，包括竞教结合课程、创新实践课程、创业教育课程等学分；

4. 必修学时+选修学时=总学时数；理论教学学时+实验教学学时=总学时数；必修学分+选修学分=总学分数；集中实践教学环节学分+理论教学学分+实验教学学分=总学分数；

## 二、专业教学计划表

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	实验 Lab Hours	实习 Practice Hours	其他 Other Hours			
公共 基础 课	031101492	思想道德修养与法律基础 Cultivation of Thought and Morals & Fundamental of Law	必修 课 C	40			4	2.5	1	№8
	031101371	中国近现代史纲要 Skeleton of Chinese Modern History		40			4	2.5	2	№8
	031101423	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		72			24	4.5	3	№8
	031101621	马克思主义基本原理概论 Fundamentals of Marxism Principle		40			4	2.5	4	№8
	031101331	形势与政策 Analysis of the Situation & Policy		128				2.0	1-8	№8
	044103681	大学英语（一） College English(1)		48				3.0	1	№10
	044103691	大学英语（二） College English(2)		48				3.0	2	№10
	052100332	体育（一） Physical Education (1)		32			32	1.0	1	№12
	052100012	体育（二） Physical Education (2)		32			32	1.0	2	№12
	052100842	体育（三） Physical Education (3)		32			32	1.0	3	№12
	052100062	体育（四） Physical Education (4)		32			32	1.0	4	№12
	006100112	军事理论 Military Principle		36			18	2.0	2	№9
	040100051	微积分II(一) Calculus(1)		80				5.0	1	№1
	040100411	微积分II(二) Calculus(2)		80				5.0	2	№1
	040101731	复变函数I Complex Variable		32				2.0	3	№1
	041101151	大学物理III（一） General Physics (1)		64				4.0	2	№1
	041100341	大学物理III（二） General Physics (2)		64				4.0	3	№1
	041100671	大学物理实验（一） Physics Experiment(1)		32	32			1.0	3	№4
	041101051	大学物理实验（二） Physics Experiment(2)		32	32			1.0	4	№4
	074102352	画法几何及机械制图（一） Descriptive Geometry & Machine Drawing (1)		48				3.0	1	№3
	074102781	画法几何及机械制图（二） Descriptive Geometry & Machine Drawing (2)		64				4.0	2	№3
	040100401	线性代数与解析几何 Linear Algebra & Analytic Geometry		48				3.0	1	№2
	040100023	概率论与数理统计 Probability & Mathematical Statistics		48				3.0	2	№2
	045101644	大学计算机基础 Foundations of Computer		32			32	1.0	1	№5

045100772	C++程序设计基础 C++ Program Designing Basics		40			8	2.0	2	№5
037102783	大学化学 General Chemistry		32				2.0	1	№1
037101943	大学化学实验 General Chemistry Experiment		16	16			0.5	2	№4
	人文科学领域 Humanities	通识课 E	96				6.0		№8,11
	社会科学领域 Social Science		64				4.0		№8,11
<b>合 计</b> <b>Total</b>			1452	80		222	76.5		

备注 1: 学生须选修人文科学领域 2 学分的管理类通识课程。

备注 2: 学时中其他可以为上机和实践学时。

## 二、课程设置表 (续) (Courses 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	实验 Lab Hours	实习 Practice Hours	其他 Other Hours			
专业基础课 Specialty Basic Courses	030102522	机械工程概论 Introduction to Mechanical Engineering	必 C	16				1.0	2	№6
	033100983	理论力学 I Theoretical Mechanics		64			4	4.0	3	№2
	033105731	材料力学 IV Mechanics of Materials		64	6		4	4.0	4	№2
	024100213	电工与电子技术 II Electrical Engineering and Electrontechnics		64				4.0	4	№3
	024100141	电工与电子技术实验 Experiment of Electrical Engineering and Electrontechnics		24	24			1.0	5	№4
	030101611	机械原理 III Theory of Machines and Mechanism		56				3.5	4	№2
	030100651	机械设计 III Mechanical Design		56				3.5	5	№2
	030101782	互换性与技术测量 Interchange Ability and Technical Measurement		24				1.5	4	№2
	030102472	机械工程材料 Materials of Mechanical Engineering		40				2.5	4	№1
	030102651	机械基础综合实验 III Poly-experiment of Mechanical Fundamentals		48	48			1.5	4、5	№4
	030100423	测试技术 Testing Technology		32				2.0	6	№4,5
	030106011	传热学 Heat Transfer		24				1.5	4	№1,2,4
	030106032	汽车制造工程学 Automotive Manufacturing Engineering		32				2.0	6	№1,2,11
	030100153	微机原理及应用 Principle and Application of Microcomputer		32				2.0	5	№3,5
	030105302	汽车构造 Automotive Structure		48				3.0	5	№1,2,6
	030102683	流体力学 Fluid Mechanics		32				2.0	3	№1,2,4

	045101693	计算方法 Computing Method		32				2.0	3	№1
	030102932	工程热力学 Engineering Thermodynamics		24				1.5	3	№1,2,7
	<b>合计 Total</b>		必 C	712	78	0	8	42.5		
选修课 Elective Courses	067101001	汽车导论 Introduction of Vehicle Engineering	选 E	16			6	1.0	4	№6
	030101071	机械振动 Mechanical Vibration		32				2.0	5	№5
	030104041	汽车设计 Automotive Design	限 选 E	48				3.0	6	№2,3,5
	030104201	汽车理论 Automotive Theories	(4 选	48				3.0	6	№2,4,7
	030103951	发动机原理 The Principles of Engine	3, 8 学 分)	32				2.0	5	№2,6,7
	067101461	电动汽车电机及驱动 Electrical vehicle machines and drive		32				2.0	5	№2,6,7
	030102361	太阳能电池制造技术与应用实践 Solar Cell Manufacture Technology and Application Practice		16				1.0	2	№1,6
	030103262	城市公共安全与人文精神 City Public Security and Humanistic Spirit		16				1.0	2	№1,6
	067101021	内燃机结构创新设计 Innovating Design on Structure of Internal-Combustion Engine	新 生 研 讨 课 选 E	16				1.0	1	№1,6
	067101031	高端产品及其先进制造 High-end Products and Advanced Manufacturing		16				1.0	2	№1,6
	067101041	增材制造(3D打印)及精密连接技术 Additive Manufacturing (3D Printing) and Precision Joining Technology		16				1.0	1	№1,6
	067101051	自动驾驶与智能网联汽车技术 Technologies for Unmanned and Intelligent Connected Vehicles		16				1.0	2	№1,6
	067101011	轻工自动装备的未来与挑战 Future and Challenge for Automatic Equipment in Light Industry		16				1.0	1	№1,6
	030101321	汽车工业产业模式与创业 Models of Automotive Industry and Entrepreneurship	选 E	16				1.0	6	№11,12
	030103491	科技文献检索 Scientific Literature Search	(2 选 1)	16				1.0	6	№5,6,12
	067101391	整车制造工艺学 Vehicle Manufacturing Technology	选 E	32				2.0	6	№1,5
	030106212	液压传动 Hydraulic Transmission		32				2.0	6	№1,4,5
	030106021	汽车有限元法 Automobile Finite Element Method	(4 选 1)	32			12	1.5	6	№5
	067101081	控制工程基础 Fundamentals of Control Engineering		32	4			2.0	6	№1,2,4,5
	030104342	计算机辅助设计 Computer-aided Design	选 E	32			12	1.5	7	№5

030103902	汽车电子控制技术 The Technology of Automotive Electronic Control	24				1.5	7	№1,2
067101381	现代控制理论 Modern Control Theory	32				2.0	7	№1,2,4,5
030103921	汽车排气净化 The Purification of Automotive Exhaust	24				1.5	7	№6,7
030103151	汽车仿真分析基础 Primary FEM Analysis of Automobile	24			8	1.5	7	№2,5
030105772	汽车营销 Automotive Marketing	24				1.5	7	№8,11
030105761	汽车法规概论 Introduction to Automotive Law and Regulations	24				1.5	7	№6,7
067100022	最优化设计 Optimized Design	24				1.5	7	№1,3,5
030106041	电动汽车动力系统设计基础 Power System Design Basis of Electric Vehicle	24				1.5	7	№5,6,7
067101411	车用燃料电池技术 Vehicle Fuel Cell Technology	24				1.5	7	№1,2,7
020100051	创新研究训练 Innovation Research Training	32				2.0	7	№2,9,12
020100041	创新研究实践 I Innovation Research Practice I	32				2.0	7	№2,9,12
020100031	创新研究实践 II Innovation Research Practice II	32				2.0	7	№2,9,12
020100061	创业实践 Entrepreneurial Practice	32				2.0	7	№8,9,11,12
<b>合 计 Total</b>		限 选 E	160			8.0		
		选 E	选修课修读最低要求 7.5 学分 minimum elective course credits required:					

备注：学时中其他可以为上机和实践学时。

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(Practice-concentrated Training)

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			
006100151	军事技能 Military Training	必 C	2 周		2.0	1	№9
031101551	马克思主义理论与实践 Marxism Theory and Practice	必 C	2 周		2.0	3	№8
030100632	工程训练II Engineering Training	必 C	4 周		4.0	3	№3
041100131	电子工艺实习 II Practice of Electronic	必 C	2 周		2.0	5	№3
030100222	机械原理课程设计 Course Project of the Mechanisms and Machine Theory	必 C	2 周		2.0	4	№3

030101882	机械设计课程设计 Course Project of Mechanical Design	必 C	2 周		2.0	5	№3
067101421	汽车设计课程设计 Course Project of Automotive Design	必 C	1.5 周		1.5	6	№3,5,9,10
030100352	专业课程设计 Special training of automotive design	必 C	3 周		3.0	7	№3,5,9,10
067101431	专业综合实践 Comprehensive Professional Experiments on Automobile	必 C	1 周		1.0	4	№1,9,10
030104371	学科基础实验 Basic experiment on automobile	必 C	1.5 周		1.5	5	№2,3,9,10
030105222	学科综合实验 Discipline Comprehensive Experiments on Automobile	必 C	1.5 周		1.5	6、7	№2,4,9,10
030100292	生产实习 Practice of Production	必 C	3 周		3.0	7	№1,8
067100644	毕业设计（论文） Diploma Project (Thesis)	必 C	15 周		10.0	7、8	№2,3,5,9,10
<b>合 计</b> <b>Total</b>		必 C	35.5 周		35.5		

#### 四、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、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。

#### 4.“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.