光电信息科学与工程专业本科培养计划

Undergraduate Program for Specialty In Optoelectronic Information Science and Engineering

一、培养目标

Ⅰ. Program Objectives

培养德、智、体全面发展，具有系统、扎实的光电理论基础，在信息的获取、传递、处理及应用等方面具有较宽广的专业知识，英语应用能力和工程实践动手能力强，人文素质和创新精神优秀，并在激光科学与工程、光纤通信系统与技术、光电系统与信息处理、光电子集成器件技术等方向具有一定专长的高素质人才。毕业生能在研究院所、高等院校、信息产业部门及其相关领域从事信息科学与技术的研究、系统集成与设计、开发等方面的工作。

Aiming at preparing all-rounded, high-quality talents with international competence, this program will enable students to be solid grounded in basic theory, wide-ranged in specialized knowledge, capable of practical work and particularly specialized in Laser Science and Engineering, Optical Fiber Communication System and Technology, Optoelectronic System and Information Processing, Optoelectronic Integrated Devices. Students can be fit into jobs in IT department research centers and colleges. They can do research, design and develop the integrated system in Information Science and Technology area.

二、基本规格要求

Ⅱ. Learning Outcomes

毕业生应获得以下几个方面的知识和能力:

1．扎实的数理基础；
2．掌握光学与光电子学、电子与信息科学的基本理论和方法；
3．解决本学科领域内的科研及工程问题的能力；
4．了解本学科发展的前沿动态；
5．较强的英语语言能力；
6．优秀的文献检索、资料查询与综述，以及科技论文和研究报告撰写的能力；
7．良好的人文社科知识和人文素质，以及较强的协调、组织能力；
8．较强的创新精神。

As students of this program, you will gain:

1．Solid grounding in maths and physics;
2．Basic theories and methods of Optics, Optoelectronics, Electronics and Information Science;
3．The competency in solving the problems in specialty of scientific research and engineering;
4．Knowledge of the development of the discipline;
5．Mastery of English;
6．Basic methods of literature survey, reviewing and scientific thesis writing ability;
7．Solid grounding in humanities and arts and ability of managing and organizing;
8．Innovative thinking.

三、培养特色

Ⅲ. Program Highlights

注重科学基础，坚持理工交叉，突出专业特色，发展学生个性。不断将学科优势转化为优质教学资源，为本科生科学实践提供强有力支持，提高本科生创新能力。

The main guiding ideology is broadening the subject groundings, aiming at inter-discipline development in Science and Engineering, featuring in specialty competence, stressing on scientific practice, and developing the initiatives of the students as well. The specialties transform the disciplinary resources into superior educational resources, and introduce the innovative scientific methods in the optoelectronic practices course, and recommend the excellent students to scientific research teams to do scientific practice. The specialties share four groups of limited electives, which are discipline-featured and the market required. There are more than 30 technical electives in specialty to meet the students' needs.

四、主干学科

Ⅳ. Main Discipline

光学工程

Optical Engineering

五、学制与学位

Ⅴ. Program Length and Degree

学制：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

六、学时与学分

Ⅵ. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：158.3 学分。

Minimum Credits of Curricular(Comprising course system and intensified internship practical training)：158.3 credits

其中，专业基础课程、专业核心课程学分不允许用其他课程学分进行学分冲抵和替代。

Major-related basic courses and core courses cannot be covered using credits from other courses in the program

完成学业最低课外学分要求：5 学分。

Minimum Extracurricular Credits：5 credits.

完成学业选修课程最低学分要求（不含人文社科类选修课程）：25 学分

Minimum Credits for Elective Courses（Non-Electives in Humanities and Social Science）：25 credits

包括：四选一的专业方向选修模块（8.5 学分）及其对应的课程设计（1.0 学分）；专业任选课程（不低于 15.5 学分），其中在本专业范围内完成专业任选课程累积不低于 5.5 学分，其它可以在全校工科专业（含本院各专业）范围内选修。

Including: Specialty-oriented module (8.5 credits) chosen one out of four and their corresponding Course Project (1.0 credits); Specialty-oriented courses (not less than 15.5 credits), of which, the elective courses offered by Specialty, accumulated no less than 5.5 credits, the other courses can be taken within the scope of elective courses offered by engineering Specialty (including all of Specialty in

our school).

1. 课程体系学时与学分

Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学分比例（%）
素质教育通识课程		必修	512/28	17.7
		选修	160/10	6.3
学科基础课程		必修	1048/60.8	38.4
专业课程	专业核心课程	必修	400/22.5	14.2
	专业选修课程	选修	384/24	15.2
集中性实践教学环节		必修	28w/12	7.6
		选修	2w/1	0.6
合计			2504+30w/158.3	100

Course Type		Required /Elective	Hrs/Crs	Percentage (%)
Essential-qualities-Oriented Education General Courses		Required	512/28	17.7
		Elective	160/10	6.3
Discipline-related Courses		Required	1048/60.8	38.4
Specialty Courses	Specialty Core Courses	Required	400/22.5	14.2
	Specialty Oriented Courses	Elective	384/24	15.2
Practical Training		Required	28w/12	7.6
		Elective	2w/1	0.6
Total			2504+30w/158.3	100

2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学分比例（%）
军事训练	必修	2/1	7.7
专业认知实验	必修	1/0.5	3.8
软件课程设计	必修	2/1	7.7
光学课程设计	必修	2/1	7.7
生产实习	必修	3/1.5	11.5
专业方向课程设计	选修	2/1	7.7
科研训练	必修	2/1	7.7
毕业设计（论文）	必修	16/6	46.2
合计		30/13	100

Course Title	Required /Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	7.7
Experiments for Specialty Cognition	Required	1/0.5	3.8
Software Programming Course Project	Required	2/1	7.7
Optical Design Course Project	Required	2/1	7.7
Engineering Internship	Required	3/1.5	11.5
Specialty-oriented Course Project	Elective	2/1	7.7
Scientific Research Training	Required	2/1	7.7
Undergraduate Thesis	Required	16/6	46.2
Total		30/13	100

3. 课外学分

Extracurricular Credits

序号	名 称	要 求		课外学分
1	思政课 社会实践	必修，提交调查报告并达标		2
2	社会实践活动	提交社会调查报告，通过答辩者		2
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者		2
3	英语水平考试	全国大学英语六级考试	获六级证书者	2
		托福考试	达 90 分以上者	2
		雅思考试	达 6.5 分以上者	3
		GRE 考试	达 325 分以上者	3
		全国大学生英语口语考试	A、B、C	3、2、1
4	计算机水平考试	全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
5	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
6	论文	在全国性或国际期刊发表论文	每篇论文	2-5
7	科研	参与科研项目	根据时间和成果，每项	1-3

注：参加校体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六至第八名者与校级三等奖等同。

No.	Activities	Requirements		Extracurricular Credits
1	Ideological and political course Social Practice	Submit a report and obtain a passing score		2
2	Community Engagement	Submitting a report and passing the oral defense		2
		Individuals awarded “Active Participant” / Teams awarded “Excellent Performance” by HUST or Hubei Youth League Committee		2
3	English Proficiency Test	CET-6	Win certificate of Band-6 or higher	2
		TOEFL	≥90	2
		IELTS	≥6.5	3
		GRE	≥325	3
		CET-SET	A、B、C	3、2、1
4	Computer Level Test	National Computer Rank Examination	Certificate (Grade 1 / 2)	2
		Qualifications for Computer and Software Technology Proficiency	Programmer	2
			Senior Programmer	3
			System Analyst	4
5	Competitions	University Level	First Prize	3
			Second Prize	2
			Third Prize	1

continue

No.	Activities	Requirements		Extracurricular Credits
5	Competitions	Provincial Level	First Prize	4
			Second Prize	3
			Third Prize	2
		National Level	First Prize	6
			Second Prize	4
			Third Prize	3
6	Academic Papers	Publication of papers in national or international journals	Each paper	2~5
7	Research Programs	Participate in research projects	Based on the contribution	1~3

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

七、主要课程及创新（创业）课程

Ⅶ. Main Courses and Innovation（Entrepreneurship）Courses

（一）专业主干课程 Main Courses in Specialty

应用光学 Applied Optics、物理光学 Physical Optics、激光原理与技术 Laser Theory and Technology、光电探测与信号处理 Optoelectronic Detection & Signal Processing、光纤光学 Fiber Optics、光纤通信技术 Optical Fiber Communication Technology 、单片机原理及应用 Principle and Application of Single Chip Microcomputer、信号与线性系统 Signals and Linear Systems、电动力学 Electrodynamics、量子力学 Quantum Mechanics、热力学与统计物理 Thermodynamics and Statistical Physics

（二）创新（创业）课程 Innovation(Entrepreneurship) Courses

创新意识启迪课程 Innovative Awareness Enlightenment Course：信息技术导论 Introduction to Information Technology、专业认知实验 Experiments for Specialty Cognition

创新能力培养课程 Innovative Ability Training Course：应用光学 Applied Optics、物理光学 Physical Optics、激光原理与技术 Laser Theory and Technology

创新实践训练课程 Innovative Practice Training Course :科研训练 Scientific Research Training、光电创新实践 Optoelectronics Innovative Practice

八、主要实践教学环节（含专业实验）

Ⅷ. Practicum Module (experiments included)

课程设计 Course Project：软件课程设计 Course Project for Software Design、光学课程设计 Course Project for Optical Design、专业方向课程设计 Course Project in Specialty Tracks

集中实践教学环节 Intensified Internship and Practical Training: 专业认知实验 Experiments for Specialty Cognition、生产实习 Engineering Internship、科研训练 Scientific Research Training、毕业设计 Undergraduate Thesis、光电创新实践 Optoelectronics Innovative Practice

专业实验 Specialized Experiments：应用光学实验 Applied Optics Experiments、物理光学实验 Physical Optics Experiments、激光实验 Lasers Experiments、光纤光学实验 Fiber Optics Experiments、光电技术实验 Optoelectronic Technology Experiments

九、教学进程计划表

Ⅸ. Course Schedule

院（系）：光学与电子信息学院　　专业：光电信息科学与工程

School (Department): School of Optical and Electronic Information　Specialty: Optoelectronic Information Science and Engineering

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-Oriented Education General Courses	必修 Required	MAX0021	思想道德修养与法律基础 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0041	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0011	马克思主义基本原理概论 Theory of Marxism	40	2.5			3
	必修 Required	MAX0001	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	72	4.5			4
	必修 Required	MAX0031	形势与政策 Situation and Policy	32	2			5-7
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Comprehensive English （Ⅰ）	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English （II）	56	3.5			2
	必修 Required	PHE0001	大学体育（一） Physical Education（Ⅰ）	32	1			1
	必修 Required	PHE0011	大学体育（二） Physical Education（Ⅱ）	32	1			2
	必修 Required	PHE0021	大学体育（三） Physical Education（Ⅲ）	32	1			3
	必修 Required	PHE0031	大学体育（四） Physical Education（Ⅳ）	32	1			4
	必修 Required	RMWZ0001	军事理论 Military Theory	16	1			1
	选 修 Elective		从不同的课程模块中修读若干课程，艺术类课程不低于 2 学分，总学分不低于 10 学分 General Education Courses(elective)	160	10			2-8
学科基础课程 Discipline-related Courses	必修 Required	MAT0551	微积分（一）上 Calculus（Ⅰ）	88	5.5			1
	必修 Required	MAT0531	微积分（一）下 Calculus（Ⅱ）	88	5.5			2
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			3
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			2
	必修 Required	MAT0701	数理方程与特殊函数 Equations of Mathematical Physics & Special Functions	40	2.5			3
	必修 Required	PHY0511	大学物理（一） Physics（Ⅰ）	64	4			2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-related Courses	必修 Required	PHY0521	大学物理（二） Physics (Ⅱ)	64	4			3
	必修 Required	PHY0551	物理实验（一） Physical Experiments (Ⅰ)	32	1	32		2
	必修 Required	PHY0561	物理实验（二） Physical Experiments (Ⅱ)	24	0.8	24		3
	必修 Required	OEI0541	信息技术导论 Introduction to Information Technology	24	1.5			1
	必修 Required	OEI0561	软件技术基础 Fundamental of Software Programming	48	3			1
	必修 Required	EEE0721	电路理论（五） Circuit Theory (V)	64	4			2
	必修 Required	OEI0581	信号与线性系统 Signal and Linear System	56	3.5		4	3
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiment	32	1	32		3
	必修 Required	EIC0591	模拟电子技术（二） Analog Electronics (Ⅱ)	56	3.5			3
	必修 Required	EIC0751	数字电路与逻辑设计 Digital Circuit and Logic Design	56	3.5			4
	必修 Required	EIC0651	电子测试与实验技术 Electronic Testing and Experiment Techniques	48	1.5	48		4
	必修 Required	OEI0511	单片机原理及应用 Principle and Application of Single Chip Microcomputer	48	3			4
	必修 Required	OEI0571	微机实验 Microcomputer Expreriments	16	0.5	16		4
	必修 Required	OEI0521	量子力学（二） Quantum Mechanics (∏)	48	3			4
	必修 Required	OEI0532	热力学与统计物理 Thermodynamics and Statistical Physics	32	2			4
专业核心课程 Specialty Core Courses	必修 Required	OEI2321	应用光学 Applied Optics	48	3			5
	必修 Required	OEI2331	应用光学实验 Applied Optics Experiments	16	0.5	16		5
	必修 Required	OEI2061	电动力学 Electrodynamics	48	3			5
	必修 Required	OEI2291	物理光学 Physical Optics	72	4.5			5
	必修 Required	OEI2301	物理光学实验 Physical Optics Experiments	16	0.5	16		5
	必修 Required	OEI2161	光电探测与信号处理 Optoelectronic Detection and Signal Processing	48	3			5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业核心课程 Specialty Core Courses	必修 Required	OEI2121	光电技术实验 Optoelectronic Technology Experiments	16	0.5	16		5
	必修 Required	OEI2151	激光原理与技术 Laser Theory and Technology	64	4			6
	必修 Required	OEI2191	激光实验 Lasers Experiments	16	0.5	16		6
	必修 Required	OEI2171	光纤光学 Fiber Optics	40	2.5			6
	必修 Required	OEI2181	光纤光学实验 Fiber Optics Experiments	16	0.5	16		6
专业选修课程 Specialty-oriented Courses			专业方向选修模块（四选一） Specialty-oriented module (choose one out of four)					
			A. 激光科学与工程专业方向课程 A: Laser Science & Engineering					
	选修 Elective	OEI2111	固体物理 Solid State Physics	48	3			6
	选修 Elective	OEI5051	半导体光电子学 Semiconductor Optoelectronics	48	3			6
	选修 Elective	OEI5431	激光器件与系统 Laser Devices and systems	40	2.5			6
			B. 光电子器件与集成专业方向课程 B： Optoelectronic Devices and Integration					
	选修 Elective	OEI2111	固体物理 Solid State Physics	48	3			6
	选修 Elective	OEI5051	半导体光电子学 Semiconductor Optoelectronics	48	3			6
	选修 Elective	OEI5621	微纳光电器件 Micro-nano Optoelectronic Devices	40	2.5			6
			C. 光通信与光网络技术专业方向课程 C: Optical Communication & Optical Network Technology					
	选修 Elective	OEI5561	通信原理（一） Principles of Communication（I）	48	3			5
	选修 Elective	OEI5391	光纤通信技术（一） Optical Fiber Communication Technology（I）	48	3			6
	选修 Elective	OEI5361	光网络技术 Optical Network Technology	40	2.5			6
			D. 光电系统与信息处理专业方向课程 D： Optoelectronic System & Information Processing					
	选修 Elective	OEI5561	通信原理（一） Principles of Communication（I）	48	3			5
	选修 Elective	OEI5391	光纤通信技术（一） Optical Fiber Communication Technology（I）	48	3			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	OEI5341	光电仪器学 Optoelectronic Instrumentation	40	2.5			6
			专业任选课 Elective Courses in Specialty					1-7
	选修 Elective	MESE0891	工程制图（一） Engineering Graphics (Ⅰ)	40	2.5			1
	选修 Elective	OEI2311	现代化学基础（二） Principle of Modern Chemistry(II)	32	2			3
	选修 Elective	OEI5611	微电子器件与 IC 设计（二） Microelectronic Device and IC Design（II）	40	2.5			5
	选修 Elective	OEI5731	超快激光微纳制造原理与技术 Principle of Ultrafast Laser Micro-nano Manufacturing and Technology	32	2			6
	选修 Elective	OEI5331	光电图像处理 Optoelectronic Image Processing	40	2.5			7
	选修 Elective	OEI5511	生物医学光学原理与成像技术 Biomedical Optics: Principles and Imaging	32	2			7
	选修 Elective	OEI5441	激光与物质相互作用 Laser- Matter Interaction	32	2			7
	选修 Elective	OEI5631	微纳光电系统 Micro and Nano Optoelectronic System	40	2.5			7
	选修 Elective	OEI5421	激光光谱 Laser Spectrum	40	2.5			7
	选修 Elective	OEI5201	固态照明与显示技术 Solid State Lighting & Display Technology	32	2			7
	选修 Elective	OEI5031	半导体薄膜材料 Semiconductor Thin Films	40	2.5			7
	选修 Elective	OEI5221	光互联与光交换网络技术 Technology for Optical Interconnection & Optical Switching Network	32	2			7
	选修 Elective	OEI5521	生物医学光子学基础 Fundamentals of Biophotonics	32	2			7
	选修 Elective	OEI5471	精密机械设计与 CAD Fine Mechanics Design & CAD	40	2.5			7
	选修 Elective	OEI5661	现代光学实验 Modern Optical Experiment	24	1	24		7
	选修 Elective	OEI5371	光纤传感及网络技术 Fiber sensing and network technology	32	2			7
	选修 Elective	OEI5211	现代材料分析技术 Modern Analytical technologies for Materials	32	2			7
	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	OEI3771	专业认知实验 Experiments for Specialty Cognition	1w	0.5			1

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
实践环节 practical training items	必修 Required	OEI3701	软件课程设计 Course Project for Software design	2w	1			1
	选修 Elective	ENG3551	工程训练（七） Engineering Training(VII)	2w	1			4
	选修 Elective	OEI3531	光电创新实践 Optoelectronics Innovative Practice	3w	1.5			7
	必修 Required	OEI3611	光学课程设计 Optical Design Course Project	2w	1			5
	必修 Required	OEI3711	生产实习 Engineering Internship	3w	1.5			6
	选修 Elective	OEI3621	激光科学与工程专业方向课程设计 Course Project in Laser Science & Engineering	2w	1			6
	选修 Elective	OEI3591	光电子器件与集成专业方向课程设计 Course Project in Optoelectronic Devices and Integration	2w	1			6
	选修 Elective	OEI3601	光通信与光网络技术专业方向课程设计 Course Project in Optical Communication & Optical Network Technology	2w	1			6
	选修 Elective	OEI3571	光电系统与信息处理专业方向课程设计 Course Project in Optoelectronic System & Information Processing	2w	1			6
	必修 Required	OEI3661	科研训练 Scientific Research Training	2w	1			5-7
	必修 Required	OEI3511	毕业设计(论文) Undergraduate Thesis	16w	6			8