PROGRAMME SELF-ASSESSMENT REPORT

For the Bachelor Degree of

Electrical Engineering and Automation

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Communication Engineering

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Software Engineering

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Internet of Things Engineering

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Appendix List

Terms and abbreviations used in the report

Terms	Full form
MOE	Ministry of Education of the People's Republic of China
CQUPT	Chongqing University of Posts and Telecommunications
CQYTI	College of Mobile Telecommunications, Chongqing University of Posts and Telecom
CIE	College of Intelligent Engineering
CCIoTE	College of Communication and Internet of Things Engineering
BDSC	Big Data and Software College

1 Professional profile

1.1 Overview of Electrical Engineering and Automation

Table 1-1 Basic Information of Electrical Engineering and Automation

Name of the program (original language)	电气工程及其自动化
Name of the program (English translation)	Electrical Engineering and Automation
Final degree	Bachelor of Engineering
Standard period of study	Four-year schooling /eight semesters
Credit points (according to ECTS)	240
Type (several can be indicated)	Full time, residential, learning-intensive program
Website of the Higher Education Institution	http://www.cqyti.com/
(first time) program start date within the academic year	Sep.01, 2006
Intake rhythm	Fall semester
Expected intake number of students	200-250
Amount and type of fees/charges	RMB 16,000 Yuan per academic year
Faculty/Department	College of Intelligent Engineering(CIE)
Department Website	http://zngc.cqyti.com
Person to contact posted on the website	Prof. Wang Jifeng
Telephone	+86-15310654332
E-Mail	1305797189@qq.com

1.2 Overview of Communication Engineering

Table 1-2 Basic Information of Communication Engineering

Name of the program (original language)	通信工程
Name of the program (English translation)	Communication Engineering
Final degree	Bachelor of Engineering
Standard period of study	Four-year schooling /eight semesters
Credit points (according to ECTS)	240
Type (several can be indicated)	Full time, residential, learning-intensive program
Website of the Higher Education Institution	http://www.cqyti.com/
(first time) program start date within the academic year	Sep. 01, 2002
Intake rhythm	Fall semester
Expected intake number of students	600-850
Amount and type of fees/charges	RMB 16,000 Yuan per academic year
Faculty/Department	College of Communication and Internet of Things Engineering（CCIoTE）
Department Website	http://ciot.cqyti.com
Person to contact posted on the website	Prof. Yi Hongwei
Telephone	+86-023-42871160
E-Mail	964177814@qq.com

1.3 Overview of Software Engineering

Table 1-3 Basic Information of Software Engineering

Name of the program (original language)	软件工程
Name of the program (English translation)	Software Engineering
Final degree	Bachelor of Engineering
Standard period of study	Four-year schooling /eight semesters
Credit points (according to ECTS)	240
Type (several can be indicated)	Full time residential learning intensive program
Website of the Higher Education Institution	http://www.cqyti.com/
(first time) program start date within the academic year	Sep. 01, 2008
Intake rhythm	Fall semester
Expected intake number of students	300-520
Amount and type of fees/charges	RMB 16,000 Yuan per academic year
Faculty/Department	Big Data and Software College（BDSC））
Department website	http://dsj.cqyti.com
Person to contact posted on the website	Prof. Yan Huifeng
Telephone	+86-023-42871202
E-Mail	4423360@qq.com

1.4 Overview of Internet of Things Engineering

Table 1-4 Basic Information of Internet of Things Engineering

Name of the program (original language)	物联网工程
Name of the program (English translation)	Internet Of Things Engineering
Final degree	Bachelor of Engineering
Standard period of study	Four-year schooling /eight semesters
Credit points (according to ECTS)	240
Type (several can be indicated)	Full time residential learning intensive program
Website of the Higher Education Institution	http://www.cqyti.com/
(first time) program start date within the academic year	Sep. 01, 2013
Intake rhythm	Fall semester
Expected intake number of students	60-120
Amount and type of fees/charges	RMB 16,000 Yuan per academic year
Faculty/Department	College Of Big Data and Software
Department website	http://dsj.cqyti.com
Person to contact posted on the website	Prof. Xiang Biqun
Telephone	+86-023-42851835
E-Mail	769046676@qq.com

2 Degree program: content, concept and implementation

2.1 Training objectives

The “13th Five-Year National Strategic Emerging Industry Development Plan” issued by the State Council has clearly pointed out that strategic emerging industries are the key development direction of the new economy and the key to achieving future competitive advantages. The state also proposed National strategies such as “Made in China 2025”, “The Belt and Road” and “Internet plus” in due course. Focusing on the above national strategies, the cultivation of innovative information-based engineering talents has become a top priority. This is because electrical engineering and intelligence, communication and information technology, software technology, Internet of Things technology and many future hotspots are highly connected, closely surrounding smart grid, mobile Internet, microelectronics, computer hardware and software, robots, artificial intelligence, New energy, biological and medical engineering. At present, the society has a great demand for application-oriented talents with a forward-looking vision and a global vision for the new economy. These four majors are to cultivate such applied professionals with both practical skills and theoretical knowledge.

According to the National Medium and Long Term Education Development Plan of the Ministry of Education of the People's Republic of China (MOE of China) and the 13th Five-Year Plan for Education Informatization in Chongqing, College of Mobile Telecommunications, Chongqing University of Posts and Telecom, Institute of Electrical Engineering and Automation, Communication Engineering, Software Engineering, and Internet of Things are based in Chongqing, facing China, closely connecting with the information industry, driving innovation-driven development, Germany's “Industry 4.0” and “Made in China 2025”. Follow the school's “information industry business school” orientation and the “professional education + general education + well-rounded education” trinity training model. Cultivate leaders with professional background and future social backbones that are suited to the comprehensive development of moral, intellectual and physical development that meet the requirements of economic restructuring and industrial upgrading.

After four years of study, students need to master a relatively solid basic knowledge of mathematics and physics; master the professional knowledge and skills, and understand the cutting-edge technology and development trends. They have strong computer operation ability and obtain national computer grade certificate or pass the computer test of Bachelor degree of College of Mobile Telecommunications, Chongqing University of Posts and Telecom. They can speak English well, read English literature by dictionary in professional related fields and write abstracts in English. They have certain listening and speaking ability, and have obtained the National English Certificate IV or passed the bachelor's degree in foreign language examination of College of Mobile Telecommunications, Chongqing University of Posts and Telecom. They have the awareness and rights of modern citizens and the sense of public welfare for serving the society; have scientific spirit, humanistic qualities and a certain natural science foundation. with broad vision, a certain interdisciplinary and cross-cultural foundation, they could think independently, be good at questioning, develop critical thinking; have certain artistic accomplishment and aesthetic ability. They have good team spirit and effective communication, coordination and cooperation ability. They have strong sense of competition; strong scientific and technological communication ability,

verbal expression and writing of scientific papers in a smooth and standardized language.

2.1.1 Training objectives of Electrical Engineering and Automation

Professional knowledge, professional skills and career directions of electrical engineering and automation are power system operation control and design analysis, motor control, electrical equipment and control, electrical mapping and computer graphics, in order to produce outstanding engineers with knowledge acquisition capabilities, engineering practice capabilities, innovation capabilities, teamwork, and organizational management leadership. They are capable of modern large-scale power plants and power system operation, design and maintenance and installation of electrical equipment, installation and commissioning, electrical equipment operation and maintenance in general industry, electrical control design of electromechanical systems, production design and technical management of equipment.

Professional training features: featuring "Electrical Automation + Power Automation + Management Capabilities", and students are expected to become key personnel with organizational management capabilities in the field of electrical engineering in about 5 years after graduation.

Please see Appendix B1 for complete electrical engineering and automation professional training programme.

2.1.2 Training objectives of Communication Engineering

The communication engineering major trains students to adapt to the development trend of modernization, digitalization, information society and global economic globalization, to have the basics of communication and information technology, information network technology, professional technology application capabilities and engineering literacy of the entire network. To have basic knowledge and management skills in business management, communication and cooperation skills, sunshine mentality, and physical fitness in order to cultivate compound talents who can design, operate, optimize, manage, market, develop, manufacture, and support technical communications, electronic information, and broadcast television.

Professional training features: featuring "Telecom full network and mobile communication technology application + enterprise management", and cultivating future leadership talents of companies with professional and management skills.

Please see Appendix B2 for a complete communication engineering professional training programme.

2.1.3 Training objectives of Software Engineering

The software engineering training program takes the theory, method, practice and application involved in software engineering as the direction of learning and employment and is committed to the development of excellent engineers with good social adaptability, international vision and engineering practice. They have a strong theoretical foundation and professional knowledge, and can engage in software industry related development, design, operation and maintenance, optimization, management, marketing and other work.

Professional training features: featuring "software engineering project development technology application + enterprise management", and cultivating future leadership talents with professional and management.

Please see Appendix B3 for a complete software engineering professional training programme.

2.1.4 Training objectives of Internet of Things Engineering

The Internet of Things Engineering Training Program takes the theory, methods, practices and

applications involved in the Internet of Things system as the direction of learning and employment. By constructing a scientific and rational curriculum structure system, this program cultivates engineers with excellent knowledge, quality and ability in the development, design, operation and management of the Internet of Things. They have mastered the necessary basic theories and professional theories and skills. They can work on the production, installation, maintenance, management, application, development and planning, design and marketing of various software and hardware devices of the Internet of Things.

Professional training features: featuring "Internet of Things-aware technology + engineering project development + enterprise management" to train future leadership talents with professional and managerial management.

Please see Appendix B4 for a complete Internet of Things Engineering professional training programme.

2.2 Learning outcomes

2.2.1 Learning outcomes of Electrical Engineering and Automation

2.2.1.1 Knowledge, skills and abilities

1) Basic science literacy and engineering abilities

- Have the relevant mathematics, natural sciences, and economic and management, knowledge required to work in electrical engineering;
- Understand and participate in the general electrical engineering production process, knowing potential positions and technical needs;
- Understand the cutting-edge technologies and application prospects of electrical engineering, such as electrical intelligence and efficient use of resources.

2) Information technology application ability

- Understand the basics of information technology , have the ability to effectively access and apply information;
- Master the basic methods of literature search, data query and use of modern information technology to obtain relevant information;
- Master the basic knowledge of computer technology and master the programming language and software related to electrical engineering;
- Have the ability to combine computer applications and expertise, such as computer-aided design and simulation.

3) Professional quality and ability

- Master the basic knowledge of electrical engineering and basic theoretical knowledge of the profession, with the ability to acquire and apply professional knowledge;
- Have strong professional practice skills and professional ability;
- Have a correct understanding of lifelong learning, the ability to acquire knowledge, continuous learning and adapt to development.

4) Engineering and professional practice ability

- Understand the operation of power systems, including power generation, transmission, distribution, and power applications;
- Have the ability to innovate design, development and improvement of general industrial electrical equipment;
- Have the ability to install, operate, commission, and maintain electrical equipment as specified.

5) International communication ability

- Have certain English writing and expression skills, including cross-cultural background knowledge and listening and speaking skills;
- Can apply English knowledge, read English literature in electrical engineering field with dictionary, and write English abstracts;
- Be equipped with international vision and cross-cultural communication, competition and cooperation skills.

6) Humanities and management skills

- Have humanities and social science literacy and engineering professional ethics;
- Have certain artistic accomplishment and aesthetic ability, and have a good sense of social responsibility;
- Have good team spirit and effective communication, coordination and cooperation skills;
- Have certain organizational management capabilities.

2.2.1.2 Assessment and requirements

1) Professional Assessment

This major was selected into the Characteristic Specialty Project of "Three Special Action Plans" in Chongqing undergraduate colleges and universities in 2015. It is also one of the six core majors of the college.

2) Market Requirements

The graduates of this major have a good mastery of their major knowledge, acquire quite enough practical abilities in engineering and have strong consciousness of innovation. They can adapt to different situations, and are in great demand in job market. They can work in the following fields: power sector, transit transportation industry, construction, manufacturing, energy, electric related industries, designing institutes and government departments. They are able to deal with the design and operation of power systems and electrical equipment, electrical design operation and maintenance, power supply and distribution systems, intelligent building design, electrical engineering construction and management, as well as the engineering design, operation and maintenance in sections such as power electronics, electric drive, instrumentation, etc..

3) Graduates Survey

The survey on the graduates of this major shows that the curriculum setting of this major is reasonable, which is closely related to the demand of the job market. After graduation, the graduates are highly adaptive, and their learning achievements fully meet the expected goals. Graduate survey of Electrical Engineering and Automation is shown in Appendix S. Graduate employment quality report can be found in the Appendix T.

2.2.2 Learning outcomes of Communication Engineering

2.2.2.1 Knowledge, skills and abilities

1) Abilities in basic science and engineering

- Understanding and applying math and natural sciences is the foundation of professional ability；
- Understanding and participating in the process of communication engineering practice, familiar with relevant technical requirements and having the potential to reach certain positions;
- Understanding the development trend of modern science and technology and their application prospects. For example: 5G mobile communication technology, Internet of things technology, etc.

2) Abilities in computer and information application

- Familiar with computer knowledge, high-level programming language and software knowledge, and proficient in using computer software and network;
- Understanding the basics of information technology, and being able to acquire and apply information efficiently;
- Being able to combine communication engineering and computer related knowledge, especially in computer-aided design, analysis and simulation. E.g.: computer-aided design and simulation
- Knowing how to gather information and data, and being able to search, collect, identify, judge information and data, and then analyze and apply them.

3) Abilities in engineering and professional practices

- Mastering the basic and advanced technical knowledge in the electronic field, able to analyze, measure, evaluate and design various circuits in the communication system and solve corresponding engineering problems;
- Familiar with the basic knowledge and technology of commonly used communication systems, mastering the theory and implementation technology of modern communication network, hot technologies and development trends in the communication field, able to develop, design, manufacture, operate and maintain, optimize communication systems, and solve problems related to engineering.

4) Professional Competence and Potential

- The abilities to acquire and apply professional knowledge;
- The skills and abilities of professional practices;
- The abilities to further study, pursue advanced studies and scientific research

5) Skills in English and international communication

- Have certain skills in English writing and expressing in English, including cross-cultural background, listening, and speaking.
- Apply English knowledge and read English articles concerning communication engineering with the aid of a dictionary, and write the English abstract of the paper;
- Have an international vision, able to communicate, compete and cooperate across cultures.

6) Skills in communication, cooperation and management

- Able to communicate, coordinate and cooperate in teams;
- Equipped with management abilities, familiar with the basic theoretical knowledge, methods, skills and ways of modern business management, with a comprehensive ability in entrepreneurial design, project management, and team management, and able to solve practical problems in enterprise management.

7) Abilities in literature and social adaptability

- Have healthy mentality, noble personality and professional ethics;
- Be legally conscious and have strong social responsibility;
- Be able to analyze, write and express fairly well;
- Be able to understand and appreciate science, literature, and art.

2.2.2.2 Assessment and requirements

1) Program assessment

"Communication engineering" is one of the six core majors of our university. It was listed as one of the first batch of undergraduate "professional comprehensive reform pilot projects" in Chongqing in 2012 (The project was the first batch of projects initiated by the ministry of education, and this is the first breakthrough in the city-level "quality engineering" project of our university in

the past five years and our school was the only ordinary university in the city that has obtained this project).In 2014, communication engineering was selected as one of the three star characteristic majors in China, rising in the list of famous characteristic majors in China ;In 2016, "communication engineering" was selected as the special specialty construction project of Chongqing "special action plan".

2) Labor market needs

Graduates of this major have strong employ-ability. They have strong practical ability, adaptability, innovation awareness, comprehensive ability as well as solid professional knowledge. They are able to work in the fields of communications, electronic information as well as radio and television. They can also work on design, operation and maintenance, optimization, management, marketing, development, manufacturing and technical support of the communications and information industries in scientific research institutes, universities, designing institute and related government departments. In the past few years, our latest graduate employment rate has been the highest among all majors in College of Mobile Telecommunications, Chongqing University of Posts and Telecom.

3) Graduate survey

The feedback of graduate survey of this major shows that the curriculum setting of this major reasonably designed, which is closely related to t labour market needs, and our graduates are highly adaptable after graduation, and their academic performance completely achieves the desired goal. Graduate survey of Communication Engineering is shown in Appendix S. Graduate employment quality report can be found in the Appendix T.

2.2.3 Learning outcomes of Software Engineering

2.2.3.1Knowledge, skills and abilities

1) Basic scientific literacy, engineering leadership and management ability

- Understand math and science, and use them to solve engineering problems
- Be able to understand and participate in the process of production management in general production enterprises, and understand the potential jobs and technical requirements;
- Be able to understand the main direction and prospects of modern technology development and application, such as the intelligent of technological products and the effective utilization of resources.

2) English and international communication

- Have good English writing and speaking skills; have a good command of English and intercultural background and have the ability to work and collaborate in foreign countries or multinational corporations;
- Acquire sufficient English professional knowledge; be able to communicate with foreign colleagues and further their study

3) Engineering and professional practice competence

- Understand the development and development process of software products
- Have the ability to programme and develop new products independently
- Be able to design according to standards of software industry by using appropriate development tools
- Be able to test software

4) Ability to communicate, cooperate and compete

- Have a healthy mind and personality

- Have a good sense of law and social responsibility
- Have team spirits
- Have the ability to manage
- Be competent in competitive environment and challenging work

5) Professional competitiveness

- Master basic theories, basic principles, basic methods and basic skills of computer software development systematically
- Master the theory of communication electronics industry and course of application basis
- Have the ability to analyze and solve problems; be able to develop safe, reliable and high quality software within reasonable period of time and costs; be able to fit into the future development and change of the subject
- Understand the writing and management of software and related documentation. Have the quality of team work and cooperation
- Have the ability to further study, continue education and do scientific research

2.2.3.2 Assessment and requirements

1) Program assessment

In 2016, software engineering was selected as one of the majors in characteristic major construction project of College of Mobile Telecommunications, Chongqing University of Posts and Telecom.

2) Labor market needs

Graduate of this major are widely accepted in the labor market. They have strong practical ability, adaptability, innovation awareness and solid professional knowledge. Due to the great demand for software talents in the current age of Internet of thing and Internet plus, most graduates of this major work in well-known software companies on communication operators, business development and java development. Based on the "trinity educational philosophy" of College of Mobile Telecommunications, Chongqing University of Posts and Telecom. The three-dimensional training method of professional education, complete education and general education improved students' overall ability, and a large number of students became civil servants , teachers as well as professional service talents in famous enterprises; the present employment rate of this major ranks in the top three in our university.

3) Graduate survey

The feedback of graduate survey of this major shows that this course is reasonably designed, which is closely related to the labor market needs, and graduates are highly adaptable after graduation, and their academic performance completely achieves the desired goals. Graduate survey of Communication Engineering is shown in Appendix S. Graduate employment quality report can be found in the Appendix T.

2.2.4 Learning outcomes of Internet of Things engineering

2.2.4.1 Knowledge, skills and abilities

1) Basic scientific literacy, engineering ability

- Have basic knowledge of mathematics, natural sciences, economics and management required for working on Internet of Things engineering
- Understand the production process of related enterprises of Internet of Things; understand the potential jobs and technical requirements;
- Understand the academic frontier and application prospect of this major

2) Ability to use computers and apply information

- Familiarize with office computer and use of Internet; have strong ability to obtain and use information
- Have the ability to combine computer application and professional knowledge, such as computer-aided design and simulation
- Familiarize with the general method of searching literature, information and data; be able to research, collect ,identify; judge as well as analyze and apply information

3) Engineering and professional practice competence

- Acquire basic theory and knowledge of majors closely related to Internet of Things like computer science, communication and computer network.
- Master basic theory and technology in the field of Internet of Things engineering; have the fundamental skills of flexibly solving practical problems with what they have learned.
- Acquire knowledge and skills about sensors, communication technology, embedded system, RFID technology which are indispensable for Internet of Things engineering.
- Have the ability to design and develop software and hardware of Internet of Things.
- Have the ability of Internet of Thing Engineering design, construction, installation, testing, operation, maintenance and management.
- Understand relevant standards in the field of Internet of Things home and abroad.
- Know the dynamic development in the field of Internet of Things and communication technology; be able to renew knowledge continuously.

4) Professional competence and potential

- Have a broad technical basic theoretical knowledge and professional knowledge in the professional field;
- Strong professional practice skills and professional ability;
- Have certain scientific research and scientific and technological development capabilities;
- Ability to re-learn, further study and scientific research.

5) English and international communication skills

- Have good English writing and expression skills, and have cross-cultural background knowledge;
- Have sufficient professional English knowledge and be able to read foreign literature.

6) Communication, cooperation and management skills

- Have good team communication, coordination and cooperation skills;
- Strong management ability, familiar with the basic theoretical knowledge, methods, skills and means of modern enterprise management, comprehensive ability in entrepreneurial design, project management and team management, and basic ability to solve practical problems in enterprise management;

7) Humanistic literacy and social adaptability

- Have a healthy mind, noble personality and professional ethics;
- Have team work and certain organizational management capabilities;
- Have a good sense of law and a strong sense of social responsibility;
- Strong analytical skills, writing skills, and language skills;
- Have a certain scientific spirit, humanistic quality, artistic accomplishment and aesthetic ability;

2.2.4.2 Assessment and requirements

1) Professional assessment

The major was launched in 2013 and was awarded the Bachelor of Science in IoT Engineering in 2017.

2) Employment market demand

Based on the school's “three in one” school-running philosophy, under the three-dimensional training mode of professional education, well-rounded education and general education, graduates of this major have a solid theoretical foundation of professional knowledge after four years of study, and have strong professional practice ability and social adaptation. Ability, strong sense of innovation, and high overall quality.

The current Internet of Things and Internet + era development has strong demand for IoT talents, and graduates of this major are widely accepted in the job market. At present, some of the graduates of this major are employed in related enterprises and institutions of the Internet of Things and application professions. Some of the students have entered civil servants, teachers, and well-known enterprises to become professional service personnel.

3) Graduate survey

The survey results of the graduates of this major show that the professional curriculum is reasonable and closely related to the needs of the employment market. After graduation, the graduates have strong adaptability and the learning outcomes fully meet the expected goals. Graduate survey of Communication Engineering is shown in Appendix S. Graduate employment quality report can be found in the Appendix T.

2.3 Module learning outcomes /Module goals

2.3.1 Modules

2.3.1.1 Modules of Electrical Engineering and Automation

The entire curriculum system is divided into 15 modules: Mathematics & Physics Fundamentals; Computer Science Fundamentals; Circuit Fundamentals; Control Engineering Fundamentals; Electrical equipment control technology; Power system basics; Power engineering design; Engineering practice; Bachelor thesis; English; Professional literacy and engineering management capabilities; Humanities and Art; Philosophy and Social Sciences; Political Thought and Moral Cultivation; The Practice of Moral, Intellectual, Physical and Aesthetics.

2.3.1.2 Modules of Communication Engineering

The whole curriculum system is divided into 15 modules: mathematics & physics fundamentals, computer science fundamentals, engineering fundamentals, engineering fundamentals practice, engineering principle, engineering applications, advanced engineering technology, comprehensive internship, bachelor thesis, English, professional literacy and engineering management capabilities, humanities and art, philosophy and social sciences, political thought and moral cultivation, the practice of moral, intellectual, physical and aesthetics.

2.3.1.3 Modules of Software Engineering

The whole curriculum system is divided into 15 modules: Subject Basis, Programming, Database and its Application, Computer Hardware, Network and Operating System, Future Technologies and Big Data, Software Engineering, Curriculum Practice, Bachelor Thesis, English, Professional Literacy and Engineering Management Capabilities, Humanities and Arts, Philosophy and Social Sciences, Political Thought and Moral Cultivation, The Practice of Moral, Intellectual, Physical and Aesthetics.

2.3.1.4 Modules of Internet of Things Engineering

The whole professional curriculum system is divided into 15 course modules: subject basic module, English module, programming module, database system module, computer hardware related module, network and operating system module, future information technology, IoT core technology module, professional practice and project implementation module, bachelor thesis module, professional quality and engineering management ability module, political thought and moral cultivation module, moral, intellectual, physical and aesthetical practice, humanities and art module, philosophy and social science modules.

2.3.2 Target matrix

2.3.2.1 Common module target matrix

The main target modules of electrical engineering and automation, communication engineering, software engineering and Internet of Things engineering are shown in Table 2-1.

Table 2-1 Common Module Target Matrix

Superior program objectives	**Intended learning outcomes for the program as a whole (competence profile/learning outcomes)** - Knowledge - Skills - Competences	**Corresponding module objectives/modules (in terms of operation)** Module designations should be clear.
Train students to use the theoretical knowledge and skills they have learned to analyze and solve practical problems.	Master new methods and technologies in the professional field; use relevant scientific knowledge to participate in professional related scientific research and technology development.	**Bachelor thesis: Graduation Project (Thesis)**
Cultivate cross-cultural exchanges, international cooperation and communication skills to better adapt to society and internationalization.	Master a foreign language, pass the school's bachelor's degree in foreign language test; have the ability to read foreign language materials and the ability to write abstract in foreign languages.	**English: College English 1-4. Practice:** English materials reading and translation for Graduation Project, English abstract writing of graduation thesis.
Good professionalism and engineering management skills.	Have a certain ability to innovate and start a business and compete in the workplace; have the ability of project management and engineering management.	**Professional literacy and engineering management Capabilities:** Guidance for College Students' Mental Health, Guidance for College students' Career Development and Employment , The Key Ability of Career, Fundamentals for College Students' Innovation Entrepreneurship ,Innovation and Entrepreneurship Practice of College Students, Human Resource Management, Financial

		Management, Marketing, Management, Organizational Behavior, Corporate Investment and Financing Management, and Modern Advertising. **Practice:** The Practice of Undergraduates' Innovation and Entrepreneurship
Broaden students' horizons; enhance cultural tastes, and enable students to possess aesthetic sentiment and artistic creation ability; foster written writing ability and verbal communication ability.	Recognize the soft value of the humanities and shape the humanities; understand music, opera performances, film and television, calligraphy, drama and recitation, etc.; form artistic originality, sensibility, aesthetic power; recognize the role of expression, communication and media; develop critical thinking and logical thinking; carry out the effective elaboration by means of rhetoric and argumentation methods.	**Humanities And Arts:** Musical Drama, From a Novels to a Films, The Introduction of Classical Music, Appreciation of Classic Films, World Literature of Three Hundred Years, Creative Writing, Rhetoric and Persuasion, Persuasion and Reasoning , Classic Speech
Cultivate students to shape rationality and belief; establish correct values; have the awareness of the duties and rights of modern citizens; have the public welfare awareness of serving the society; cultivate students' spirit of scientific exploration and technological innovation; widen students' perspectives on civilization so as to deeply understand the historical evolution of human civilization and the exchange and confrontation between different civilizations.	Understand the symbiosis between people, the community and the country; understand the connection between morality and happiness; understand the evolution of European civilization and its relationship with other civilizations to cultivate students' vision of globalization; understand the development, conflict, integration and integration of various civilizations in the general environment as well as the relevant significance to the development of the world, politics, economy and culture; understand the ideological foundation and historical process of science and technology, as well as, the scientific and ethical issues of human life.	**Philosophy and Social Sciences:** The Theory of Justice, Positive Psychology, Freud, Jung and Adler, Zen Culture, The Modern Progress of European Civilization, American Social and Public Policy, International Conflicts of the Contemporary World, Economics, Chinese Public Policy and Urbanization, American Democracy , Russell and History of Western Philosophy, The World Established by Socrates, Confucius and His Disciples, Information Technology and Society, Ethics in Life Science.
Cultivate students' correct	Help students establish a correct	**Political Thought**

understanding of China's current social form and social code of conduct; shape and realize the spirit of self-worth and teamwork.	outlook on life, values, morality and legal system and learn to solve practical problems encountered in the path of growth and success; promote the all-round development of college students.	**and Moral Cultivation:** Moral Education and Basics of Law, Outline of Modern Chinese History, Basic Principles of Marxism, Introduction to Maoism and Theoretical System of Socialism with Chinese Characteristics, Situation and Policy.
Master the movement and basic military theories; cultivate students to understand of China's current social exactly; understand social behavior standards; realize self-value and shape team spirit; cultivate students with good team spirit, effective communication, coordination and cooperation ability; promote the improvement of the overall quality of college students.	Exercise students' sports and military training, team spirit; help college students to form perfect personality and good psychological quality; help students establish correct outlook on life, values, morality and legal system and learn to solve practical problems encountered in the path of growth and success; promote the all-round development of college students.	**The Practice of Moral, Intellectual, Physical and Aesthetics:** Military Theory and Training (including freshman orientation and safety education), Physical Education I-IV, Extension Training, Competitive Sports, Campus Activities and Social Practice, Volunteer Service, Art Accomplishment and Practice, Masters Rostrum, Masters Lecture.

2.3.2.2 Target matrix of Electrical Engineering and Automation

Table 2-2 Target Matrix of Electrical Engineering and Automation

Superior program objectives	**Intended learning outcomes for the program as a whole (competence profile/learning outcomes)** - Knowledge - Skills - Competences	**Corresponding module objectives/modules (in terms of operation)** Module designations should be clear.
Develop students with basic knowledge of mathematics, natural sciences and information technology, and build the foundation for follow-up courses to develop students' ability to acquire knowledge, apply knowledge and innovation.	Deepen the understanding of the natural sciences; develop the ability to solve practical problems in engineering applications by means of reasonably applying mathematical models.	**Mathematics & Physics Fundamentals:** **Mathematics:** Higher Mathematics（1-2）, Linear Algebra **Physics:** College Physics (A), Physics Experiment (A)

Students should master the basic knowledge of computer technology; cultivate strong computer operation ability; use information technology to effectively solve practical problems in the field of engineering technology, laying a solid foundation for future study.	Master the basics of computer technology, programming language and software related to electrical engineering; possess the ability to combine computer applications with expertise, such as computer-aided design and simulation.	**Computer Science Fundamentals:** College Computer, C Language Programming **Practice:** College Computer Experiments, C Language Programming Experiments.
Students have extensive circuit basics to lay the foundation for subsequent professional course learning.	Master the basic theories, basic knowledge and necessary engineering basics of the electrical engineering.	**Circuit Fundamentals:** Basics of Electrical Circuit Analysis, Basics of Electronic Circuit, Digital Circuit and Logic Design **Practice:** Basics of Electrical Circuit Analysis Experiments, Basics of Electronic Circuit Experiments, Digital Circuits and Logic Design Experiments
Students should master the basic concepts, basic theories and basic analysis methods of theoretical analysis of control systems. They can use MATLAB/SIMULINK simulation tools to simulate, analyze and debug the control system, laying the foundation for the follow-up course.	Master the time domain and transform domain analysis methods of signals and systems; master the basic theory and basic methods of feedback control systems, and deeply understand the basic principles and composition of automatic control systems; cultivate students' ability to analyze and design automatic control system with the comprehensive application of control theory and its relevant knowledge; obtain the basic ability to use computer engineering to aid in design, calculation, and simulation.	**Control Engineering Fundamentals:** Control Signals and Systems, Principles and Application of Automatic Control, Control Engineering, Modern Control Theory and Applications, MATLAB and its Application in Engineering, MATLAB and its Application in Electrical Engineering **Practice:** Principles and Application of Automatic Control Experiment, Control Engineering Experiment, MATLAB and its Application in Engineering Experiment, MATLAB and its Application in Electrical Engineering Experiment ,Course Project (Control engineering), Course Project (Principles and Application of Automatic Control)
To master the skills of electrical engineering design, maintenance of electrical equipment, operation and control of electrical systems, installation and commissioning of electrical equipment, production design of equipment, technical management.	Be proficient in the use of PLC technology to improve the relay contactor system, learn to use the programmable controller to design the general control system; master the basic hardware design methods and development steps; master the design of closed-loop speed control system, simulation test and optimization, system ; develop students' ability to analyze and solve complex problems.	**Electrical equipment control technology:** Single Chip Microcomputer and Embedded Control Technology, Computer Control Technology, Electrical Control and PLC Technique, Electrical Machinery Drive and Control, Control Motor, Motion Control System **Practice:** The above-mentioned related curriculum experiments, Integrated Design of Electrical Courses, etc.

Cultivate students' engineering computing skills in the power system and their ability to analyze and solve problems, and develop students' ability to experiment and analyze problems and solve problems. To lay the foundation for further study and study of electric energy conversion methods.	Master the knowledge of power system analysis, power electronics technology, high voltage technology, etc., can analyze the transient and steady state processes of power systems, correctly understand the basic principles of power system insulation coordination, and understand the cutting-edge technologies and development trends of power system automation. Ability to acquire knowledge and continue learning.	**Power System Basics:** Power Electronic Technology, Power System Analysis, High Voltage Technology **Practice:** The above related curriculum experiment.
Master the basic components and design methods of the power system, master the design specifications of the power system, and have the electrical design capabilities to design the actual power system.	To enable students to understand the process of production, transformation, transmission, distribution and use of electric energy in electric power systems, to master the design steps and methods of power generation or distribution, transmission, and substation of electric power systems, and electrical main wiring of various parts, and relay protection Design principles and methods. To enable students to master the power system design specifications, with strong basic analysis and design capabilities of the power system, and the ability to draw electrical design drawings using AutoCAD.	**Power Engineering Design:** Electrical Mapping and Cartography, Power Supply and Distribution Technology, Electrical Part of the Power Plant, Relay Protection of Power System and its New Technology **Practice:** The above-mentioned related curriculum experiment and Comprehensive Design of Power System.
To consolidate, deepen and expand the knowledge of students acquired in the theoretical curriculum, broaden their horizons and vision; cultivate independent operational and maintenance capabilities, improve professional skills; cultivate comprehensive ability to observe problems, analyze problems and solve practical problems to enhance their professionalism Quality; develop a rigorous work attitude and professional ethics.	Understand the basic processing methods and types of machinery industry, master the use of basic machine tools and machining tool tools in machining; recognize the process steps and technical requirements of parts processing to master manual welding and assembly technology; learn and master the production and debugging methods of simple electrical devices And steps, fault analysis and elimination of simple faults; familiar with the workflow and control requirements of the micro flexible processing system; master the control requirements, address assignment, principle wiring diagram of the typical unit of the micromachining system, and realize the unit through software programming and debugging	**Engineering practice：** Metalworking Practice, Electric Fitting Practice, Graduation Practice

	Control; master the control of the forward and reverse of the three-phase asynchronous motor; familiar with the production and implementation of the power distribution board; master the use of PLC programming software, AutoCAD and other software.	

2.3.2.3 Target matrix of Communication Engineering

Table 2-3 Target Matrix of Communication Engineering

Superior program objectives	**Intended learning outcomes for the program as a whole (competence profile/learning outcomes)** - Knowledge - Skills - Competences	**Corresponding module objectives/modules (in terms of operation)** Module designations should be clear.
To develop students with basic knowledge of mathematics, natural sciences, and information technology to develop the foundation for follow-up courses and develop students' ability to acquire knowledge, apply knowledge, and innovate.	Deepen the understanding of the natural sciences, develop and be able to reasonably apply mathematical models to solve practical problems in engineering applications.	**Mathematics & Physics Fundamentals** **Mathematics**：Higher mathematics, linear algebra, Complex Function **Physics**：College Physics (A), College Physics Experiment (A).
Students will master the basic knowledge of computer technology, cultivate students to gain strong computer operation ability, use information technology to effectively solve practical problems in the field of engineering technology, and lay a solid foundation for future study.	Master the basics of computer technology, master the programming language and software related to communication engineering; the ability to combine computer applications with professional knowledge, such as computer-aided design and simulation.	**Computer Science Fundamentals:** College Computer, C Language Programming, Applied Technology of Database. **Practice:** College computer experiment, C language programming experiment, Applied Technology of Database experiment.
Master the basic knowledge of circuit analysis, electronic circuits, digital circuits and logic design, microprocessor system architecture and embedded system design, and lay a solid foundation for	Ability to analyze, calculate and design various circuits; master various theoretical analysis methods for signals and systems; be able to analyze the function realization mechanism of single-chip microcomputers and have the corresponding design, debugging	**Engineering Fundamentals:** Basics of Circuit Analysis, Basics of Electronic Circuit, Digital Circuit and Logic Design, Communication Electronic Circuit, Signal and System, Digital Signal

learning professional application courses.	and maintenance capabilities. And apply relevant knowledge to develop and design simple application systems.	Processing, Microprocessor System Structure and Embedded System Design. **Practice:** Experiment (Basics of Circuit Analysis), Experiment (Basics of Electronic Circuit), Experiment (Digital Circuit and Logic Design).
Deepen and consolidate the understanding and mastery of engineering basic knowledge, and have strong design and development capabilities in electronic design, microprocessor and embedded system design.	With the basic capabilities of electronic engineers, with the ability to develop and design digital circuits and microcontroller systems, the ability to use the theoretical knowledge of the application to develop, design and implement a simple application system.	**Engineering fundamentals** **Practice:** Course Project (Digital Circuit and Logic Design), Course Project (Microprocessor System Structure and Embedded System Design), Electric Fitting Practice.
Fully master the basic principles of communication engineering implementation and have basic practical skills.	Master the basic tasks of communication, basic terminology, basic composition of communication network and basic theory of communication system, basic laws of electromagnetic field, propagation characteristics of radio waves, characteristics of random processes, principle of modulation and demodulation, understanding of multiplexing technology and multiple access technology The principle of basic analytical skills and basic practical skills in communication engineering.	**Engineering Principles:** Survey of the Communication Engineering, Electromagnetic Fields and Electromagnetic Waves, Communication Principles. **Practice:** Experiment (Basics of Communication Technology).
Have a comprehensive and systematic understanding of the reality of the current system, and the ability to understand and analyze all kinds of communication systems.	Master the basic concepts, features, structures and functions of communication network, transmission network, exchange network, access network, support network, next-generation communication network, etc.; Master the main characteristics of transmission, understand attenuation and bandwidth; Master the transmission characteristics and application of metal transmission line, waveguide transmission line and	**Engineering applications:** Modern Information Network and Innovation, Principles of Telecommunication Transmission. **Practice:** The related course experiment above.

	optical fiber; Master the calculation of wireless transmission loss.	
Acquire the latest and cutting-edge communication engineering expertise and skills and be able to quickly learn and understand emerging technologies and adapt to the rapid development of industry.	Master new methods and techniques in this field; Participate in the design, analysis, implementation and technical development of communication engineering projects by using relevant professional knowledge; Have a keen perception of new professional knowledge and new technology and the ability to take the initiative to learn, and establish the concept of lifelong learning.	**Advanced engineering technology:** Mobile Communication Principle and Technology, The Technology of IOT and 5G, The Principle and Technology of Telecommunication Cloud, The Principle and Technology of Telecommunication Cloud, Optical Fiber Cable Engineering and Measurement Technology, Multimedia communication technology, Wideband Access Technology, Next Generation Network Principle and Technology, Technical English. **Practice:** The related course experiment above.
Make students understand the implementation process of enterprise engineering, design method of system and equipment, technical parameters, performance and development status of related products, so as to further verify and consolidate theoretical knowledge and cultivate students' professional technical practice ability.	Be familiar with the communication system transmission and exchange, network as well as the whole entire network process; Be familiar with communication engineering implementation, system and equipment design, technical parameter setting and optimization, performance and related product development.	**Comprehensive Internship:** Enterprise Internship, Internship of Mobile Communication, Internship of Switching Technology, Network and Security Technology Internship, Internship of Wideband Access Technology, Internship of Optical Fiber Communication.

2.3.2.4 Target matrix of Software Engineering

Table 2-4 Target Matrix of Software Engineering

Superior program objectives	**Intended learning outcomes for the program as a whole (competence profile/learning outcomes)** - Knowledge - Skills - Competences	**Corresponding module objectives/modules (in terms of operation)** Module designations should be clear.

Master the basic knowledge of mathematics and physics, and lay a solid foundation for further research.	Have mathematics and physical related basic knowledge; solve various problems in engineering and practice using natural scientific knowledge; Students are required to have basic theoretical and basic analytical methods of circuits, motors, analog electronic circuits, digital electronic circuits, measurement technology and control technology; be able to complete the follow-up electrical and electronic experiment independently; Understand and use the common electrical and electronic equipment in real life; master the basic application of electrical and electronic technology.	**Subject Basic:** Advanced Mathematics, College Physics, College Physics Experiment, Electrical and Electronics
Cultivate students to master solid engineering foundation and professional knowledge, and understand the development trend and current situation of this major.	Acquire the basic knowledge of computer programming and ability to write simple programs.	**Programming:** Computer Introduction, C Programming, C++ Programming
Students should have the foundation of database system and professional knowledge to lay the foundation for the follow-up study of professional courses.	Have the basic knowledge of computer software and the theory, and be able to understand the development of conventional computer application system.	**Database and its Application**: Discrete Mathematics, Algorithms and Data Structures, Java Programming, Web Dynamic Web Design, Android Application Programming, Database Principles and Techniques
Have the ability to comprehensively apply the scientific theories, analyze and solve problems and solve practical engineering problems by means of methods and techniques. Be able to participate in the design of production and operation system, and have	Acquire the knowledge of computer organization and structure and design of embedded system.	**Computer Hardware:** Computer Organization and Structure, Microcomputer Principle and Interface Technology, Embedded System Design

the ability to operate and maintain.		
Have the knowledge and practical skills in networking and Linux operating systems.	Have the basic knowledge of computer network and computer operating system.	**Network and Operating System:** Operating Systems, Computer Networks
Be able to analyze and solve practical software engineering problems comprehensively by using professional knowledge, and learn spontaneously and optimize theoretical knowledge system according to engineering needs.	Master software engineering development process, and be able to use common testing tools for software testing.	**Software Engineering:** Software Engineering, Software Quality Assurance and Testing
Have the related graduation practice and large-scale comprehensive practice courses to enhance the students' comprehensive project practice ability, and build the bridge for students to transform from school to enterprise role.	Use algorithms and data structures, Java programming, database principle, dynamic web page design, design of Android applications, such as embedded system design to examine the main professional course content detail application, through these courses related to application of the curricular knowledge for students to master and flexible application of knowledge of software engineering curriculum gradually accumulated application control.	**Curriculum Practice:** Algorithm Synthesis Design, Web Dynamic Web Course Design, java Comprehensive Experiment, Android Application Comprehensive Course Design, Embedded System Design Course Design, Java Website Comprehensive Training **Practice:** Graduation Practice, Graduation Design.
Cultivate students' entrepreneurship and innovation ability.	Master basic knowledge of cloud computing and big data, major technologies, resource integration cloud computing technology based on cluster technology, and resource segmentation cloud computing technology based on virtualization technology. Understand the main direction and trend of information technology development in the future.	**Future Technologies and Big Data:** Future Information Technology, Cloud Computing and Big Data

2.3.2.5 Target matrix of Internet of Things Engineering

Table 2-9 Object Matrix of Internet of Things Engineering

Superior program objectives	**Intended learning outcomes for the program as a whole (competence profile/learning outcomes)** - Knowledge - Skills - Competences	**Corresponding module objectives/modules (in terms of operation)** Module designations should be clear.
Develop students with basic knowledge of mathematics, natural sciences, and information technology to develop the foundation for follow-up courses and develop students' ability to acquire knowledge, apply knowledge, and innovate.	Deepen the understanding of the natural sciences, develop and be able to reasonably apply mathematical models to solve practical problems in engineering applications.	**Subject basis** **Mathematics:** Advanced Mathematics, Linear Algebra, Probability Theory and Mathematical Statistics. **Physics:** University Physics (A), Physics Experiment (A), Electrical and Electronics.
Train students to have a solid engineering foundation and professional knowledge; understand the development trend and current situation of the major.	Have the basics of computer programming and the ability to write simple programs.	**Programming:** introduction to computer science, C language programming, C++ language program design.
Students have the foundation and professional basic knowledge of the database system, laying the foundation for the subsequent professional course study.	Be equipped with computer software and theoretical knowledge, with the development capabilities of conventional computer application systems.	**Database System** **Module:** algorithms and data structures, Java programming, Web dynamic web design, database System Principle
Develop the ability to comprehensively apply scientific theory to analyze and solve problem, and use technical means to analyze and solve practical engineering problems; participate in the design of production and operation systems, with the ability to operate and maintain.	Knowledge of computer organization and structure, and knowledge of embedded system design.	**Computer hardware related:** Computer organization and structure, microcomputer principle and interface technology, embedded system design.

Have the knowledge and practical ability of network and Linux operating system.	Master the basics of computer networks and computer operating systems.	**Network and operating system:** operating system, computer network.
Enable students to have the engineering practice ability in the specialty of the Internet of Things engineering.	Has the basic knowledge of IOT software and hardware, with the ability to propose, analyze and solve problems.	**IoT core technology** radio frequency identification technology, short-range wireless Communication technology, Internet of things security technology, and IOT System Design.
Have deeper and cutting-edge expertise and practical skills in the field of IOT engineering.	Master new methods and technologies in this field; apply relevant scientific knowledge to participate in scientific research and technology development related to IOT engineering.	**Professional Practice and Project Implementation:** comprehensive design of algorithm, Java comprehensive experiment, Web dynamic design, embedded system design course design.
Enable students to have a more comprehensive understanding of the developing direction of this major.	Master the developing direction and trends of this major.	**Future Information Technology:** cloud computing and big data, future information technology.

2.4 Employment market prospects and practice relevance

2.4.1 Employment market prospects and positioning

2.4.1.1 Employment market prospects and positioning of Electrical Engineering and Automation

The major of Electrical Engineering and Automation is a characteristic specialty of Chongqing. It aims to cultivate the application-oriented, cross-type and innovative talents, who can be suitable for the pillar industries for the development of the Southwest China, and the emerging industries and high-tech industries. So we should focus on the study of professional knowledge in electrical equipment and control, electric power engineering and other fields, so as to achieve the goal of professional talent training.

The major focuses on cultivating students' engineering practice ability, professional comprehensive ability as well as innovation and entrepreneurial awareness. Graduates will have good organizational management ability and teamwork ability. They will be equipped with a solid theoretical foundation and professional knowledge, and can apply the professional knowledge and skills they have learned in the work, with a good ability to adapt. According to the graduate employment information provided by the Employment Center, the graduates of this major are welcomed by many employers all over the country.

Employment units include: State Grid Chongqing Electric Power Company, Chongqing Iron

and Steel Group Industry Co., Ltd., China Aviation Aircraft Limited by Share Ltd. Han-Zhong Aircraft Branch, SIEMENS (China) Co., Ltd. Shanghai Branch, Urumqi Railway Bureau, Shanxi Da-tang International New Energy Co., Ltd., CISC Hai Zhuang Wind power (Chongqing) Equipment Co., Ltd., Guangdong Power Grid Company Foshan Power Supply Bureau, Chengdu Railway Bureau, Chongqing Chana Auto Co. Ltd., Inner Mongolia Power (Group) Co., Ltd., Chongqing Chuanyi Control System Co., Ltd., etc.

Due to the reasonable entry requirements (see 2.5), counsellors, class tutors, and academic tutor guidance (see 3.4), as well as the priority given to basic knowledge and engineering practice, the employment rate of graduates in this major has remained above 96% for nearly four years.

2.4.1.2 Employment market prospects and positioning of Communication Engineering

Communication engineering major has been selected as a national and provincial specialties construction projects in the past few years, enjoying a high reputation in the same type of institutions.

Communication technology is an important technological and economic driver in the 21st century, and it is also an area in which information science and technology develop rapidly and is extremely dynamic. Nowadays, the popularization of modern communication technologies, such as digital mobile communication, optical fiber communication, and Internet network communication, has brought unprecedented convenience to people in transmitting information and obtaining information. The application of communication technology is becoming more and more extensive, which greatly increases the demand for communication engineering technicians. Therefore, communication engineering has a very broad development prospect.

This professional training program aims to cultivate application-oriented, interdisciplinary and innovative talents suitable for Chongqing's priority development of information technology industry, emerging industries and high-tech industries, focusing on communication engineering, electronic information engineering, radio and television engineering, etc. The college intends to apply sufficient foundation and practical strength to achieve the goal of professional talents.

The program focuses on training students' practical ability, professional comprehensive ability, innovative ability and international communication ability. The graduates of this major have strong adaptability, with broad career prospects, and huge social needs. They will be good at the production and operation management in various industries of communication and information engineering. Graduates of this major will be particularly suitable for design, operation and maintenance, optimization, management, marketing, development, manufacturing and technical support in fields related to communication system. A large amount of research and management is required in large communication network operators, manufacturers of communication equipment, design institutes, research institutions, universities and government departments .

The program has established an undergraduate follow-up system to conduct a comprehensive analysis of the graduates. The Communication Engineering Department in College of Mobile Telecommunications, Chongqing University of Posts and Telecommunications is an important talent training base for communication engineering in China. It has provided more than 5,000 talents for the communication and information industry and other related industries for more than a decade. The analysis shows that our graduates are all over the country and are warmly welcomed by many companies. The employment rate of graduates of this major has remained at 90% in recent years.

In order to meet the high demands of relevant industries for talents in communication

engineering, and to deliver qualified graduates to relevant units in the communications industry. The training programs of this major has been carefully developed, and a large number of experienced teachers combine theory with practice in teaching to achieve the comprehensive training of students. In addition, as an important way to acquire knowledge, guest lectures have always been attached importance in our school. In order to expand the job opportunities, many well-known and successful experts and scholars are often invited to give lectures to our students, which gives students a good opportunity to learn about the future jobs during their undergraduate studies.

In order to better integrate teaching and practice, and improve students' engineering practice ability, CCIoTE has signed the school-enterprise cooperation agreement with eight companies, they are Chengdu Zong-Heng Zhi-kong Science and Technology Ltd., ZTE Education Cooperation Center, Chongqing Chong-You Huice Communications Technology Co., Ltd., China Mobile Group Design Institute Co., Ltd. Chongqing Branch, Chengdu Yi-Cheng Science and Technology Ltd., Chongqing Xinke Communication Engineering Co., Ltd., Chongqing IT Construction Supervision & Consultation Co., Ltd. and Chongqing Han-Bo Photoelectric Co., Ltd. These companies offer more hands-on opportunities for undergraduates and are also beneficial to the development of students and teachers. The long-term and stable cooperative relationship between College of Mobile Telecommunications, Chongqing University of Posts and Telecom and the companies have brought benefits to both parties and promoted the development of the communications industry. Please refer to Appendix P2 for the signed cooperation agreement.

This training program also encourages students to participate in off-campus internships. Students can go to the company to conduct internships instead of graduation design (thesis). In this way, students can apply knowledge directly to the real world and attain more meaningful training.

CCIoTE constantly improves the talent training program, and improves the level of talent training, and cultivates students' solid professional skills and innovative capabilities in the field of communication to meet the needs of communication technology development. From the employment data in recent years, some graduates have participated in the research work in the institutes, and others work in state-owned enterprises or private enterprises. They are mainly engaged in research, development, design, network operation and maintenance and optimization, as well as marketing, etc. There are also a part of students who choose to continue their studies in many universities and colleges at home and abroad.

2.4.1.3 Employment market prospects and positioning of Software Engineering

Based on the Software Engineering of Chongqing University of Posts and Telecommunications, the major of Software Engineering is set up on the huge demand for software talents in the IT and communications industries. The major is affiliated to the School of Big Data and Software, College of Mobile Telecommunications, Chongqing University of Posts and Telecommunications, and is based on the “Computer Application Technology” master’s degree authorization point of Chongqing University of Posts and Telecommunications, the “Computer Science and Technology” master’s degree authorization point, and the “Communication Engineering” master’s degree authorization point. In 2007, the major preparations began. In 2008, software engineering started to enroll students. In 2013, it became a school-level specialty. In 2017, 12 undergraduate classes were recruited to 360 students. There are 32 classes of full-time undergraduate students in the school, with a total number of about 900.

Relying on communications discipline, the traditional preponderant discipline of Chongqing

University of Posts and Telecommunications, the major of Software Engineering starts from the current social needs, and strives to explore new measures for training new talents with communications background in software engineering, deeply promoting the training mode reform of software talents with communications background, and actively exploring the talent training mode in the 21st century, focusing on equipping the talents with comprehensive qualities across communications, electronics and computer software disciplines.

Having mastered the basic theoretical knowledge, professional knowledge and basic skills as well as methods of software engineering, the students have the ability to use advanced engineering methods, techniques and tools to analyze, design, develop, maintain and manage software systems, the practical ability to participate in engineering projects, and also teamwork ability. With a certain spirit of innovation and practical ability, they have the potential to develop into the high-level engineering technology and management talents of the software industry.

Graduation: By 2017, this major has trained 607 graduates. Excellent students have been hired by well-known software companies and large enterprises like Alibaba, Tencent, NetEase, Baidu, Foxconn, specializing in major-relevant professionals like software development, testing, and technical maintenance. Seven students are admitted to postgraduate and one goes abroad.

Based on the internship program and related requirements, students will take the internship in the company under the dual guidance of academic tutors and corporate tutors. The goal of "Let the students understand the enterprise, the enterprise understand the students" has been realized, the recognition of the students has been improved, and the "win-win" mode between students and universities and enterprises has been achieved. Please refer to Appendix P3 for some signed cooperation agreements.

2.4.1.4 Employment market prospect and positioning of Internet of Things Engineering

The market for Internet of Things (IOT) Engineering is huge, so the employment prospects are also very good. Graduates can engage in the in-depth, comprehensive and interdisciplinary information dissemination. They can also work in designing and production, or research, design, construction, operation, monitoring and management of building energy conservation in government management departments, scientific research institutions, design institutes, property and energy management units, etc.

Students of the Internet of Things Engineering mainly study the basic theories and basic knowledge of related disciplines such as computer, electronics, communication and automation. They should systematically master the basic theories and basic knowledge of the Internet of Things technology, the Internet of Things architecture, and the basics of Internet of Things perception and identification, IOT information processing technology and IOT security technology, have the IOT system's software and hardware design and development capabilities, and also the ability to conduct comprehensive research, development and integration in IOT systems and their applications; they are expected to engage in fields like comprehensive designing, development, application, management and maintenance of protocol standards and systems, communication architecture, wireless sensors, information security, or they can continue their further study and engage in research and teaching in universities or research institutions.

IOT Engineering graduates can engage in research, designing, construction, operation, monitoring and management of building energy conservation in government management departments, scientific research institutions, design institutes, consulting companies, construction engineering companies, property and energy management, building energy-saving equipment and

product manufacturing and production enterprises.

After graduation, students can work in industries like new energy, Internet or E-commerce, computer software, electronic technology or semiconductor or integrated circuit and communication or telecom or network equipment, They are mainly engaged in the professions like embedded software engineers, Java development engineers, and hardware engineers. Please refer to Appendix P4 for some signed cooperation agreements.

2.4.2 Practical ability

2.4.2.1 Practical ability in Electrical Engineering and Automation

1) Experiment

In order to implement the coordinated development concept of knowledge, skills and abilities, we should strengthen innovative practical teaching. This major shares the experimental platform of electrical type, with a total laboratory area of 2346 square meters, 1370 instruments and meters, with a total investment of 14.361 million Yuan(RMB). There are nine professional laboratories and three in-campus internships base, they are electrical and electronic Lab, motion control Lab, automatic control Lab, embedded system Lab, programmable controller Lab, measurement and control Lab, AC/DC speed control Lab, power supply Lab and distribution system Lab, power system relay protection Lab , and metalworking practice, electric-fitting practice, electrical and mechanical control internships base and so on. These practice platforms have opened many experimental and practical courses for students of this major and relevant majors, such as basic circuit experiment, analog circuit experiment, digital circuit experiment, theory of automatic control experiment, control engineering, automatic control principle of curriculum design, MATLAB and its engineering application experiment, the application of MATLAB in electrical engineering, electrical and drag the control experiment, power electronics technology, electrical control and PLC technology experiment, SCM and embedded control technology experiment, power supply technology experiment, the electric power system relay protection and new technology experiment, power system analysis experiment, integrated design of electrical class curriculum group, comprehensive design of power system and the graduation practice, which can provide necessary guarantee for training students' practical ability and practical ability. At present, the professional laboratory equipment has been on a large scale, which can fully meet the needs of the professional experimental teaching.

2) Internship

Internships include short-term and long-term internships. Short-term internship includes metalworking practice (one week), electrical-fitting (one week) and social practice (two weeks). Short-term internship requires students to complete the internship on campus under the guidance of experienced teachers, and finally submit internship reports. Long-term internship belongs to the graduation practice, divided into school practice and off-campus practice. According to the internship program and related requirements, students concerned are required to find internship positions by themselves under the guidance of both on-campus and corporate tutors, and they are required to practice in an enterprise for more than 8 weeks. Students who choose school practice are also required to complete the needed practical training for 8 weeks under the guidance of two tutors on the campus according to the internship program and relevant project requirements.

3) Course design and bachelor thesis

The course design includes the designs of automatic control principle, electric course group comprehensive, and electric power system comprehensive. In order to improve students' ability of

comprehensive application of knowledge and innovation and practice ability, multiple courses are integrated to complete the large-scale comprehensive innovation design.

The titles of undergraduate graduation project (thesis) are derived from enterprise or engineering application, which aim to test students' ability to integrate knowledge which they have learned before graduation. The bachelor's thesis mainly includes the contents and quality management of the students' free choice of topics, scheme demonstration, thesis proposal, mid-term test, software and hardware design, paper pass, thesis defense, etc. The content and quality of the bachelor's thesis are strictly controlled, so that the quality of the thesis meets the expectation.

4) Technological innovation practices

The school has arranged a 0.5 ECTS theory course which is called “The College Students' innovation and entrepreneurship Foundation” for freshmen. The course of College Students' Innovative Entrepreneurial Practice with 4.0 ECTS is arranged for senior students, at the same time the innovative undertaking specialized course with 5.5 ECTS (4.5 ECTS theory + 1.0 ECTS experiment) which is called Electrical Control and PLC Technology is arranged for sophomores, and arranged the professional practice innovative undertaking course curriculum group of Integrated Design of the Electric Category 3.0 ECTS for the junior students.

In the past five years, students of this major have participated in many innovation and entrepreneurship competitions at the university, municipal level and national level. Such as one gold prize of the third China “Internet plus” innovation and entrepreneurship competition in Chongqing, one bronze medals in the national finals and one second prize of the national university Internet application innovation competition. Award certificates Refer to Appendix O1.

2.4.2.2 Practice ability in Communication Engineering

1) Experiment

In order to implement the coordinated development concept of knowledge, skills and abilities, and strengthen innovation education and practical teaching, we have established electrical and electronic Lab, basic Lab of electronic information specialty and professional Lab of electronic information. Among them, the basic Lab of electronic information specialty is composed of signal and system Lab, communication principle Lab and microcontroller Lab, and the specialized laboratory of electronic information consists of transmission Lab, exchange Lab, broadband network Lab and wireless sensor Lab. Through careful maintenance and timely update of experimental equipment, students of the department of communication and information are guaranteed to offer courses such as basic circuit experiment, analog circuit experiment, digital circuit experiment, signal and system experiment, basic communication technology experiment, electronic circuit course design, information acquisition and other course experiment as well as SCM course design。

During the three years from 2013 to 2016, the school increased investment in labs and built four professional examination labs, they are electronic technology Lab, electronic design automation and DSP Lab 1, electronic design automation and DSP Lab 2 and mobile communication technology Lab. A total of 849 sets of teaching experimental equipment (including software) were purchased, with a total investment of 821.503 million yuan(RMB). It is mainly responsible for the cognition practice, basic experiment, professional experiment, graduation practice and graduation design. At present, the professional foundation and comprehensive experiments for students of communication engineering from grade 2 to grade 4 are completed in the experimental training center.

2) Internships

Internships include both short-term and long-term forms. Short-term internships include electrical dressing (one week) and social practice (three weeks). Short-term internship requires students to complete internship training and submit an internship report at the laboratory and practice base inside and outside the College of Mobile Telecommunication in Chongqing University of Posts and Telecommunications under the guidance of experienced engineers and university instructors from the corporate unit. Long-term internships (eight weeks) include in-enterprises internships or professional laboratory internships. Long-term internship requires relevant students to find internship positions on their own, and internships in the company for 8 weeks, based on the internship outline and related requirements, under the dual guidance of the company's internal supervisors and corporate tutors. Students who are not connected to the internship unit are supervised by experienced engineers and teachers at the school to complete task-oriented internships in multiple professional laboratories.

3) Course project and bachelor thesis

Course project: for the professional foundation course, a total of two weeks of course design, so that after learning the relevant theoretical basic knowledge of the students, in a task-oriented manner, under the guidance of practical and experienced enterprise technicians and teachers, Conduct task-oriented course project. Some of these students also have the opportunity to participate in professional-related competitions at all levels and in various types of colleges, such as: SCM design competition, National Undergraduate Electronic Design Contest, FPGA Design Contest.

The subjects of bachelor's thesis comes from the scientific research or engineering application of the teachers, which are designed to test the students' ability to integrate the knowledge they have acquired before graduation. Bachelor's thesis includes program review, student free choice, program argumentation, mid-term study, paper review, paperpass, and bachelor's thesis defense. It aims to strictly control the content and quality of the bachelor thesis and ensure that the paper meets the expected requirements.

4) Technological innovation practice

In the first grade, the school has arranged the theoretical course -- Basic Innovation and Entrepreneurship of College Students, 0.5 ETCS; arranged the “Innovation and Entrepreneurship Practice for College Students” course, one ETCS in the fourth grade; and also arranged the innovative and entrepreneurial course--Modern Information Network and Innovation in the third grade, 13 ETCS.

Over the past five years, students of the program have received numerous honors at the level of the college, city and national levels. A number of university students innovation projects have received subsidies from the University Students' Innovation Pilot Program awarded by the College of Mobile Telecommunication in the Chongqing University of Posts and Telecommunications. Please see Appendix O2 for specific awards.

2.4.2.3 Practice ability in Software engineering

1) experiment

Software engineering and Internet of Things engineering belong to the School of Big Data and Software. The labs are shared. The following is an introduction to the labs.

Experimental and internship teaching is an indispensable teaching link for science and engineering related majors. On the basis of sharing the experimental teaching resources of the

Computer Experimental Teaching Demonstration Center of Chongqing University of Posts and Telecommunications, the Electrical and Electronic Experiment Teaching Center and the Communication Characteristic Software Experiment Center, the software engineering and Internet of Things engineering projects actively raised funds and built a computer training and teaching base and technology innovation activity base.

The computer experiment teaching demonstration center is composed of computer basic Lab, computer hardware Lab, multimedia Lab, computer network Lab, CAD laboratory and other laboratories. Among them, the value of experimental training equipment used by software engineering and internet of things engineering is total 5 million Yuan(RMB), including simulation software, projectors, servers, microcomputers, printers, scanners, multimedia, ERP sand table simulation equipment. These advanced teaching and experimental instruments and equipment have better met the needs of talent training and meet the requirements of the training program.

Since the establishment of the professional teaching laboratory, it has been insisting on opening to the whole school. Not only undergraduate majors such as computer science and technology, software engineering, and network engineering in the School of Big Data and Software, but also several majors in the faculty such as electronic information, communication engineering, automation, information management and information system. The laboratory is fully utilized and open to the public, and its support for professional talents training is very significant.

Electrical and electronic experiment teaching center consists of electrician Lab, analog circuit Lab, digital circuit Lab, SCM technology Lab, interface technology Lab, electronic technology comprehensive Lab, communication technology comprehensive Lab, electronic technology Lab, embedded system Lab and basic physics Lab and other professional basic and professional Labs. Among them, the value of experimental training equipment used by software engineering and Internet of Things engineering is 3 million Yuan(RMB).

In addition, College of Mobile Telecommunications, Chongqing University of Posts and Telecom has established a fishing town game software development company and a municipal creative industry base. It provides basic practical practice guarantee for the realization of cultivation means of software engineering and Internet of Things engineering. It also provides a good practice platform for students of Big Data and Software College.

2) Internships

Internships include both short-term and long-term forms. Short-term internships include metalworking internships (three weeks) and social practice (two weeks). Short-term internship requires students to complete internships and submit internships at the internship base inside and outside the College of Mobile Telecommunications, Chongqing University of Posts and Telecom and the industry university research base, under the guidance of experienced engineers and university instructors. Long-term internships include internships in enterprises. Long-term internship requires relevant students to find internship positions on their own and internships in the company for eight weeks based on the internship outline and related requirements, under the dual guidance of the instructor and the business tutor.

3) Course design and bachelor thesis

Course design includes student project, algorithm synthesis design, Android application programming, java website comprehensive training, web dynamic web course design, embedded system course design, database course design.

The subjects of the undergraduate thesis are derived from the teacher's scientific research or

engineering application, and are designed to test students' ability to integrate the knowledge they have acquired before graduation. Bachelor's thesis mainly includes content review, student free choice, program demonstration, mid-term inspection, design inspection, random inspection, bachelor's thesis defense and other aspects of content and quality management, strict control of the content and quality of the bachelor thesis, the paper achieves the expected quality.

4) Technological innovation practice

In addition to the four-week innovation and entrepreneurship practice training, students can also participate in technical innovation practice activities. College of Mobile Telecommunications, Chongqing University of Posts and Telecom has a perfect organization and management system, a good environment and conditions.

From 2009 to 2013, the students of the project received more than 150 awards at the university, municipal level and national level. More than 300 university students' innovation projects received the USST awards of the University Student Innovation Pilot Program, Shanghai and the state. Appendix O3 provides a certificate of awards.

2.4.2.4 Practice ability in Internet of things engineering

1) Internship

Internship includes short -term and long-term. Short - term internship includes electrical (one week) and social practice (three weeks). Short-term internships require students to work under the guidance of experienced engineers and university mentors from corporate units，Finish the training in the laboratory and practice base of College of Mobile Telecommunications, Chongqing University of Posts and Telecom， and submit the internship report. Long-term internship (eight weeks) includes internship in enterprise or professional laboratory. Long-term internship requires students to follow the internship program and related requirements. Under the dual guidance of internal supervisor and enterprise supervisor, students can find internships themselves. And they should have eight-week internship in the enterprise. Students who do not find internship in the enterprise should be guided by experienced engineers and teachers to complete the task-oriented internship in multiple professional laboratories.

2）Course design and bachelor thesis

Course design includes integrated algorithm design，Java comprehensive training, Integrated design of dynamic web pages， Embedded system course design. In order to improve students' ability of comprehensive application of knowledge and innovative practice ability， the course design requires the integration of multiple courses to complete the large-scale innovative integrated design.

The subjects of undergraduate thesis come from scientific research or engineering application of teachers. The aim is to test students' ability to integrate knowledge they have learned before graduation. The thesis mainly includes program review， the content and quality management of students' free choice of subject, scheme demonstration, mid-term inspection, design inspection, spot check, bachelor's thesis defense and other aspects, strict control of the content and quality of the bachelor's thesis, and the expected quality of the thesis.

3）Technological innovation practices

College of Mobile Telecommunications, Chongqing University of Posts and Telecom has perfect organization management system and good activity environment and condition. The school arranged the theoretical course named the foundation of college students' innovation and entrepreneurship for students in the first grade. The fourth grade arranged the course of college

students' innovation and entrepreneurship practice. One credit for each course. At the same time, the department arranged the comprehensive curriculum design for the practice of innovation and entrepreneurship for the second and third grade.

In addition to the innovation and entrepreneurship training that students must attend，they can also participate in technical innovation activities. Please see Appendix O4 for details of the awards.

2.5 Admission and entry requirements

Chinese universities are divided into six categories, including research university, research-teaching university, teaching-research university, teaching university, applied university and fachhochschule. College of Mobile Telecommunications, Chongqing University of Posts and Telecom is an applied university. It is also the first group of applied technology university (college) alliance members.

2.5.1 Admission and entry conditions

Interested in entering the College of Mobile Telecommunications, Chongqing University of Posts and Telecom to pursue undergraduate major and bachelor's degree, students are required to take the entrance examination of national universities of the People's Republic of China or to take the unified examination in relevant provinces and cities. Those who meet the following conditions may sign up for the examination：(1)You should abide by the constitution and laws of the People's Republic of China. (2) You must be a high school graduate or have the equivalent. (3) You must be healthy.

Candidates registered for the College of Mobile Telecommunications, Chongqing University of Posts and Telecom are required to take the college entrance exam. The school enrollment work strictly implements the relevant policies and regulations of the ministry of education and the provincial department in charge of enrollment. We will implement the principles of fair competition, fair selection and openness and transparency, comprehensive assessment of morality, intelligence, physique and beauty, overall merit, selective admission. There is no sex ratio limit in all majors. There is no requirement for professional grade difference. Foreign languages are unlimited. Former graduates and fresh graduates are the same. There is no discrimination requirement for physically disabled students.

2.5.2 Admissions process

College of Mobile Telecommunications, Chongqing University of Posts and Telecom enrolls students from 28 provinces (municipalities and autonomous regions) in China. According to the admission plan for full-time ordinary colleges and universities which is issued by the Ministry of Education unified. We should formulate a enrollment source plan of College of Mobile Telecommunications, Chongqing University of Posts and Telecom by different provincial and different professional. In the admission process, such as the number of applicants for various majors is unbalanced. Under the coordination of the enrollment provinces (municipalities, autonomous regions) admissions offices, our school can adjust the enrollment plan among different majors properly. Within the annual enrollment scale approved by the state, we set aside 1% of the enrollment plan, so as to adjust the unbalance of the enrollment sources in the unified examination.

In the provinces that implements sequential voluntary submit students' files, the school gives priority to the first choice candidates. If the first choice is not fully admitted, the best applicants will be selected from the following volunteers in turn. In the province that implements parallel voluntary submit students' files, according to the related province (municipality, autonomous region)

regulation is carried out, the basic principle is mark first, follow volunteer.

When admitting a major, according to the principle that put into a file the result is preferential, from high to low choose an advantage to admit. When the scores are the same, by the sum of Chinese, mathematics two subjects from high to low order again. There is no sex ratio limit in each major, There is no requirement for professional grade difference. Foreign languages are unlimited.

Volunteering to apply for the College of Mobile Telecommunications, Chongqing University of Posts and Telecom, in line with the state and province (municipality, autonomous region) regulations of additional score and the conditions for reducing score, Approved by the provincial (municipality, autonomous region) examination institute to register for the candidates of our school, our school recognizes and enrolls such examinees for their extra points.

2.5.3 Admission transparency

According to the Education law of the People's Republic of China, universities and provincial admission offices should carry out the admission work for new students according to the principle of “The university is in charge and The admission office is under monitor”. Universities should accept students according to published admission rules. The examinee that passes thought moral examination, meets the admission score of the corresponding batch and meets the requirements for college admission scores, admission can be determined and letter of admission will be sent. Universities have a responsibility to explain to those who have been assigned but have not been accepted. The provincial admission office is responsible for supervising the implementation of national admission policies and plans as well as correcting violations of national admission policies or regulations.

In the process of all kinds of enrollment, our school has carefully implemented the requirements of “Five strict” and” Eight prohibits”. Strict implementation of policy provisions and work procedures. According to the national and Chongqing enrollment procedure, the procedure is legal and the operation is feasible. We will strictly implement the enrollment plan and the professional enrollment plan. The enrollment plan implemented. All are approved and consented by the competent authority. We will implement the admission regulations and enforce the charging standards strictly. The charging standard of our school strictly implements the state and Chongqing’s charge regulations, and does not charge any fees other than those approved by the administrative department.

2.6 Course / Content

Appendix C1 Curriculum Plan of Electrical Engineering and Automation
Appendix C2 Curriculum Plan of Communication Engineering
Appendix C3 Curriculum Plan of Software Engineering
Appendix C4 Curriculum Plan of Internet of Things Engineering

3 Degree program: structure, method and implementation

3.1 Professional ability training structure system

Electrical engineering and automation, communication engineering, software engineering, and IoT engineering talent training are following the three-in-one program, professional education, general education, and well-rounded education are organically integrated. Around the center, we strive to cultivate “complete people”. The biggest feature is that students' extracurricular education practice and classroom teaching are equally important. Professional education focuses on cultivating students' professional and technical application ability. General education focuses on broadening students' horizons, enhancing their cultural taste, and cultivating their philosophy, social science spirit and humanities and art literacy. The goal of well-rounded education is to cultivate students with excellent character, temperament and comprehensive ability to greatly enhance students' emotional intelligence.

The training structure system of electrical engineering and automation is shown in Figure 3-1.

The training structure system of communication engineering is shown in Figure 3-2.

The training structure system of software engineering is shown in Figure 3-3.

The training structure system of IoT engineering is shown in Figure 3-4.

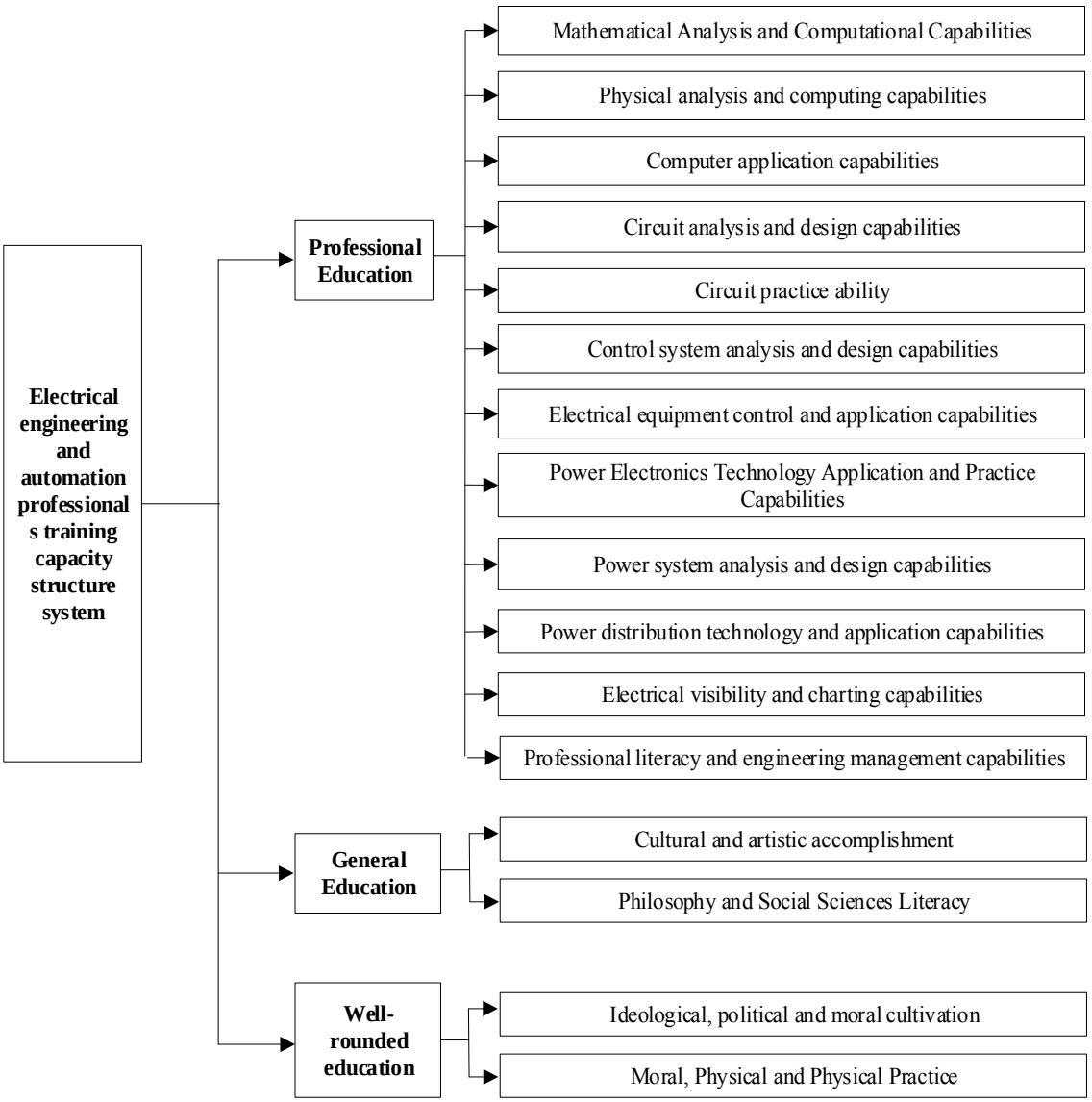

Figure 3-1 The training structure system of electrical engineering and automation

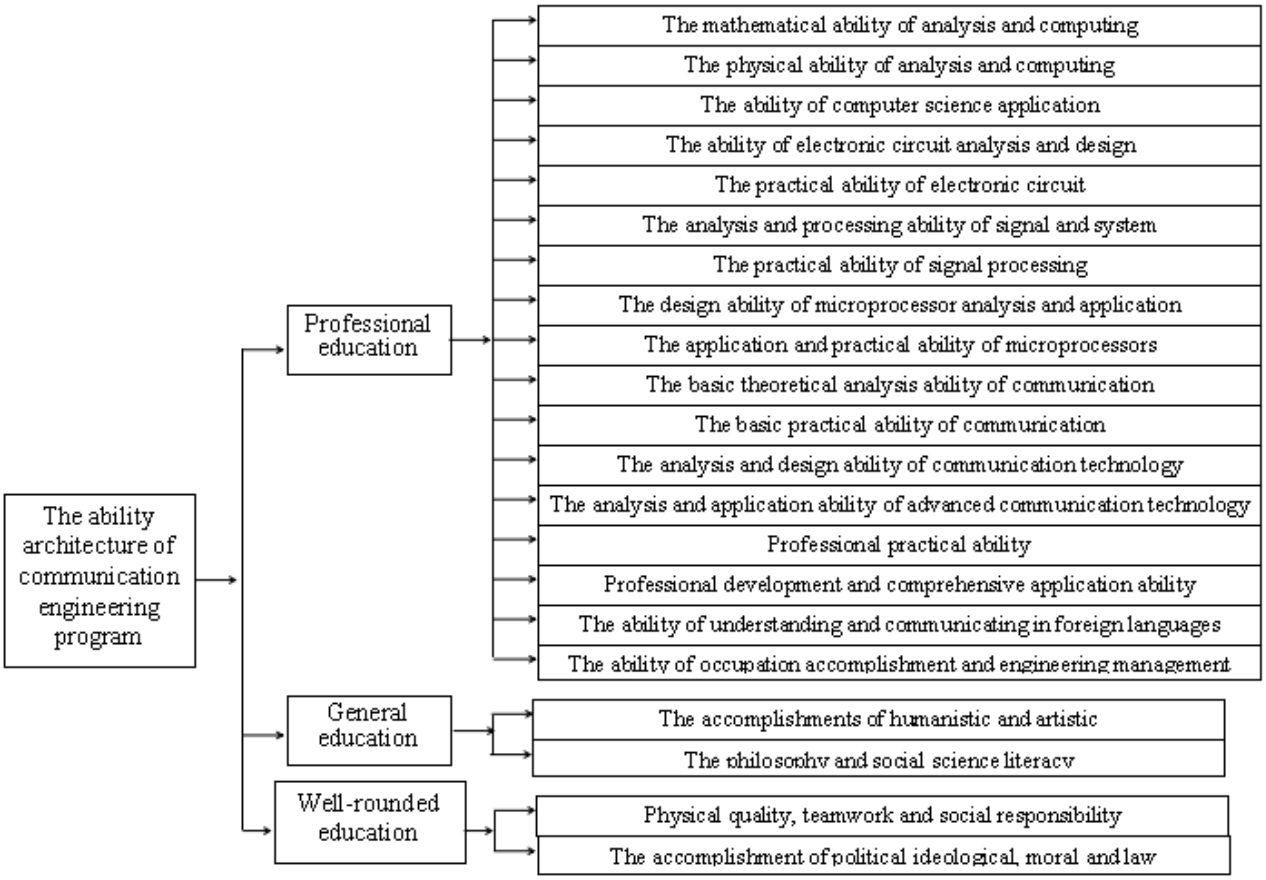

Figure 3-2 The training structure system of communication engineering

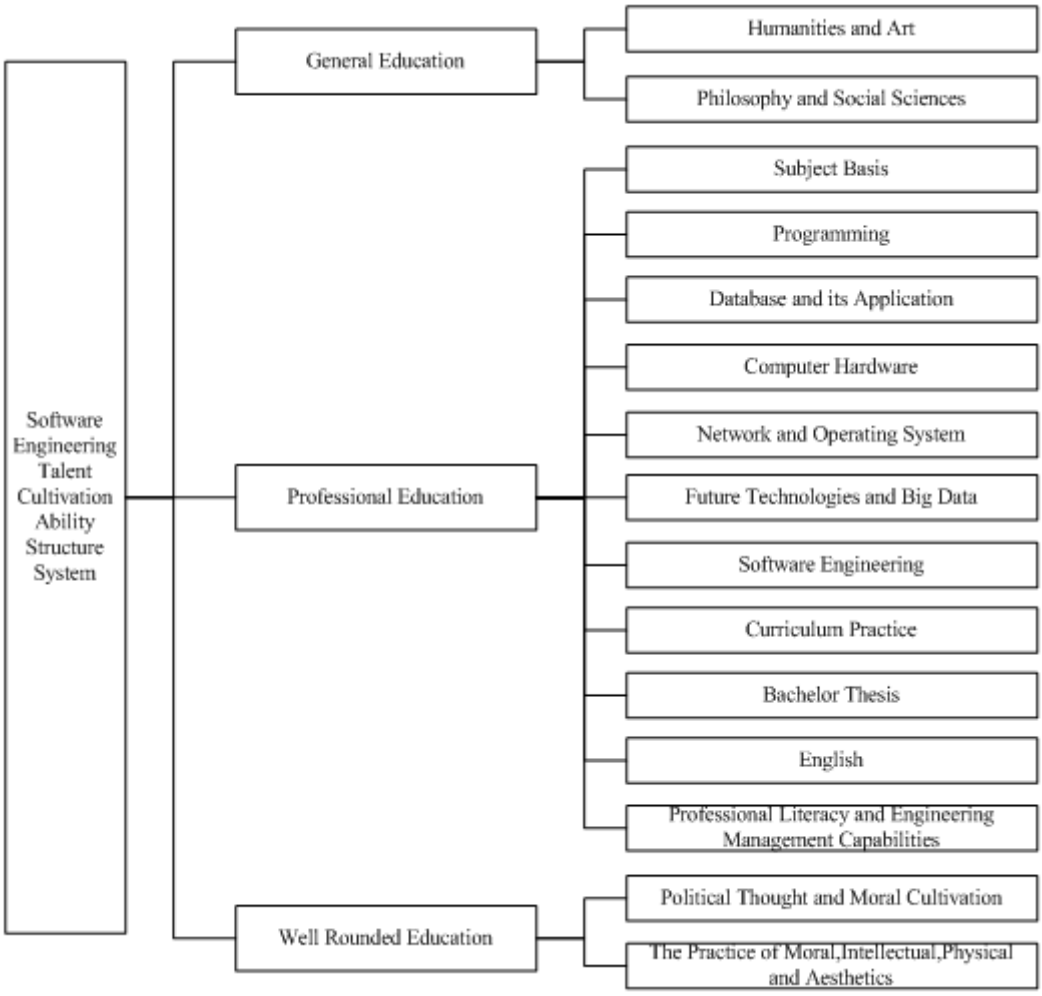

Figure 3-3 The training structure system of software engineering

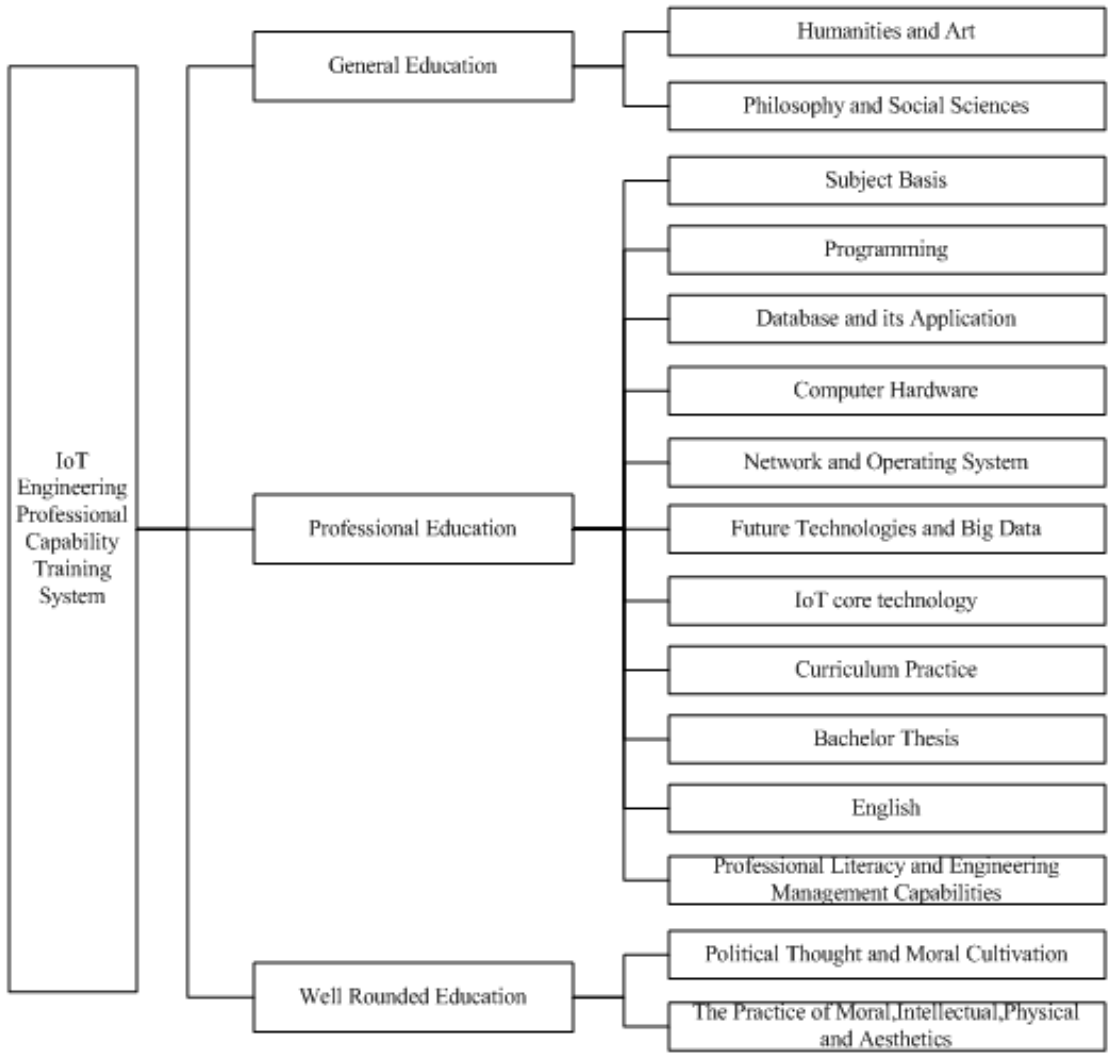

Figure 3-4 The training structure system of the IoT engineering

3.2 Structure and modularization

3.2.1 Modularization

3.2.1.1 Modularization of Electrical Engineering and Automation

The professional education of electrical engineering and automation corresponds to ASIIN TC 02 Electrical Engineering Information Technology 2011-12-09 201712152131231 standard, divided into 11 modules to cultivate professional competence. General education is divided into 2 modules, which can assist the formation of students' professional ability, expand the knowledge outside the students' majors, and cultivate the students' comprehensive quality. The well-rounded education is divided into 2 modules, which play a certain role in cultivating career ability, innovation ability and product development ability. The credits and hours allocation for the three sections are shown in Table 3-1.

Table 3-1 Credit Distribution and Percentage for Professional Education, General Education, and Well-Rounded Education of Electrical Engineering and Automation

Course system category		ECTS credits	The proportion	Class hours	The proportion
Profession education	Professional compulsory courses	100.5	41.8%	3018	40.6%
	Professional elective courses	22	9.2%	660	8.9%
	Professional experiment and practice (including graduation practice)	81	33.8%	2430	32.7%
General education	Compulsory courses	12	5%	384	5.2%
	Elective courses	7	2.9%	224	3%
Well-rounded education	Well-rounded courses	6	2.5%	236	3.2%
	Well-rounded practice	11.5	4.8%	475	6.4%
Total		240	100%	7427	100%
The practice courses (including intra-course experiment, practical teaching, independent practice, innovation and entrepreneurship practice, social practice)		92.5	38.5%	2917	39.3%

Appendix C1 Details for the study hours and credits for each module. The proportion of credits for the modules in the entire lesson plan is shown in Figure 3-5. The proportion of credits for each module is shown in Table 3-1.

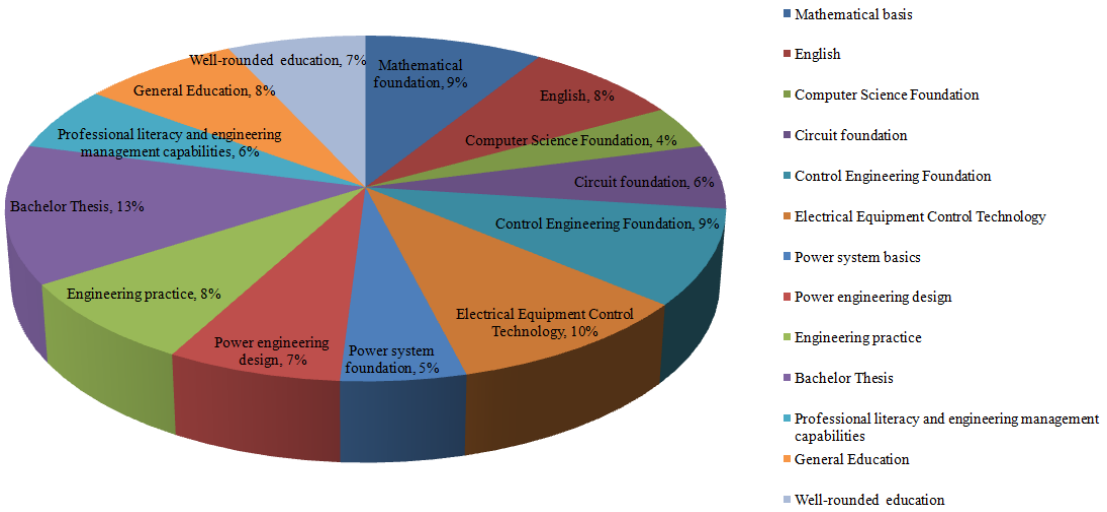

Figure 3-5 ECTS proportions for modules of Electrical Engineering and Automation

3.2.1.2 Modularization of Communication Engineering

In the communication engineering professional talent training program, professional education corresponds to the standard of ASIIN TC 02 Electrical Engineering Information Technology 2011-12-09 201712152131231 standard, divided into 11 modules to cultivate professional competence. General education is divided into 2 modules, the formation of auxiliary professional ability to expand the knowledge outside the student's major and to cultivate the overall quality of the students. The well-rounded education is divided into 2 modules, which play a certain role in cultivating the career ability and further cultivating the innovation ability and product development ability. The credits and hours allocation for the three sections are shown in Table 3-2.

Table 3-2 Credit Distribution and Percentage for Professional Education, General Education, and Well-Rounded Education of Communication Engineering

Course system category		ECTS credits	The proportion	Class hours	The proportion
Profession education	Professional compulsory courses	133	55.4%	3993	54.0%
	Professional elective courses	16	6.7%	480	6.5%
	Professional experiment and practice (including graduation practice)	55	22.9%	1650	22.3%
General education	Compulsory courses	12	5%	384	5.1%
	Elective courses	7	2.9%	224	3.0%
Well-rounded education	Well-rounded courses	7	2.9%	256	3.5%
	Well-rounded practice	10	4.2%	408	5.5%
Total		240	100%	7395	100%

The practice courses (including intra-course experiment, practical teaching, independent practice, innovation and entrepreneurship practice, social practice)	65	27.1%	2058	27.8%

Appendix C2 Details for the study hours and credits for each module. The proportion of credits for the modules in the entire lesson plan is shown in Figure 3-6. The proportion of each module credit is shown in Table 3-2.

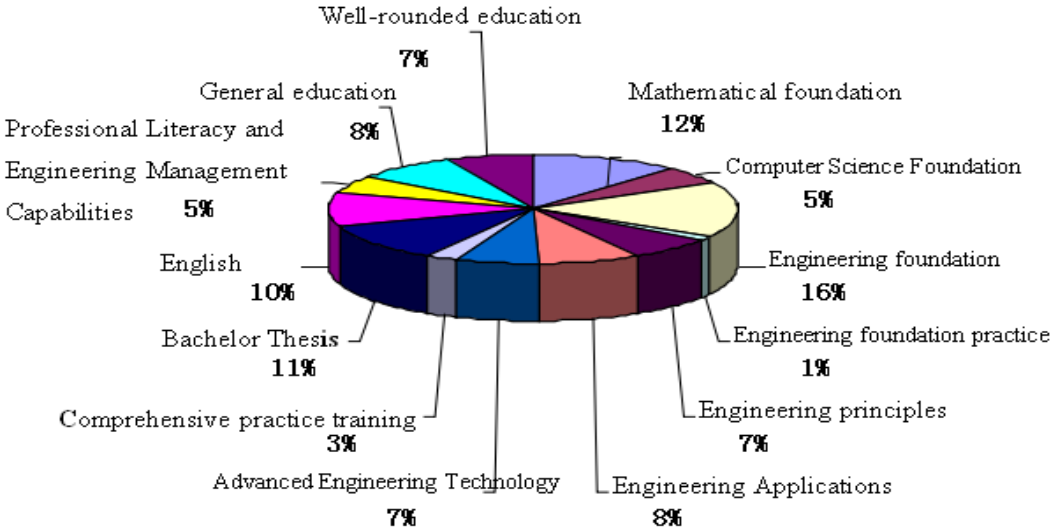

Figure 3-6 Percentage of credits for each module of Communication Engineering program

3.2.1.3 Modularization of Software Engineering

In the software engineering professional training program, professional education corresponds to ASIIN TC 02 Big Data and Software College 2011-12-09201712152131231 standard, divided into 15 modules, to cultivate professional ability. General education is divided into 2 modules, to assist the formation of professional competence, to expand knowledge beyond the student's major, to cultivate students' comprehensive quality. The well-rounded education is divided into 2 modules, in the training of the career ability to play a role in further developing innovative capabilities and product development capabilities. The credits and hours allocation of the three sections are shown in Table 3-3.

Table 3-3 Credit Distribution and Percentage for Professional Education, General Education, and Well-Rounded Education of Software Engineering

Course system category		**ECTS credits**	**The proportion**	**Class hours**	**The proportion**
Professional education	Professional course teaching	145	60.4%	4353	58.9%
	Professional experiment and practical teaching	59	24.6%	1770	23.9%

	(including graduation practice)				
General education	Compulsory courses	12	5%	384	5.2%
	Elective courses	7	2.9%	224	3.0%
Well-rounded education	Well-rounded courses	7	2.9%	256	3.5%
	Well-rounded practice	10	4.2%	408	5.5%
Total		240	100%	7395	100%
The practice courses (including intra-course experiment, practical teaching, independent practice, innovation and entrepreneurship practice, social practice)		69	28.8%	2178	29.5%

Appendix C3 Details the study hours and credits for each module. The proportion of credits for each module in the entire training program is shown in Figure 3-7. The proportion of each module credit is shown in Table 3-3.

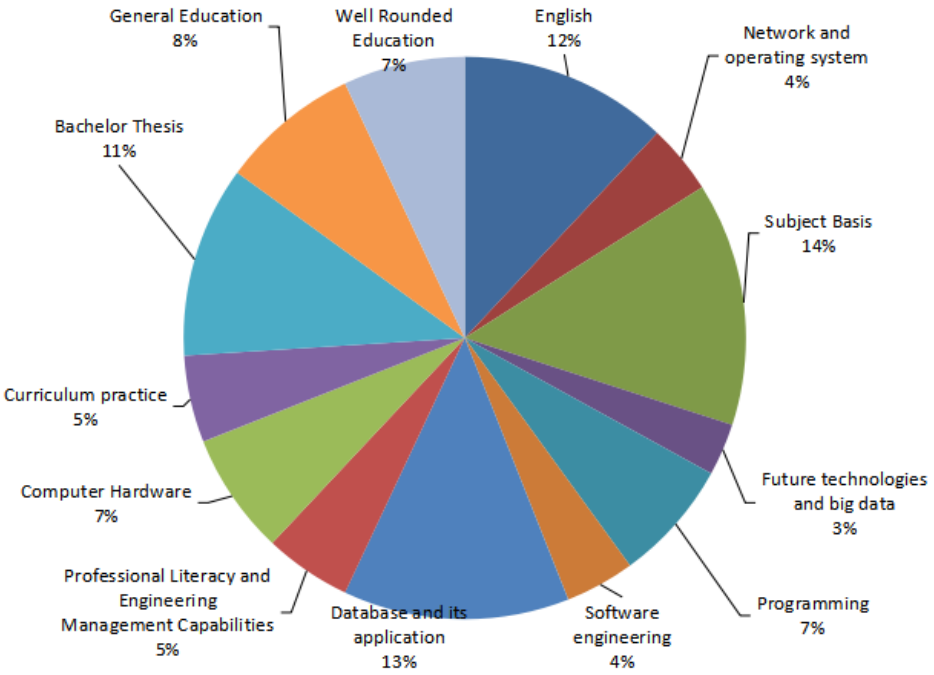

Figure 3-7 Percentage of credits for each module of Software Engineering program

3.2.1.4 Modularization of Internet of Things engineering

In the talent training program of Internet of Things engineering, according to the ASIIN TC 02

Electrical Engineering Information Technology 2011-12-09 201712152131231 standard, the professional education is divided into 11 modules to cultivate professional competence. The general education is divided into 2 modules to assist in the formation of professional competence, expand knowledge beyond the professionalism of students, and cultivate the overall quality of students. The well-rounded education is divided into 2 modules, which play a role in cultivating career ability, innovation ability and product development ability. The credits and hours assignment of the three sections are shown in Table 3-4.

Table 3-4 Credit Distribution and Percentage for Professional Education, General Education, and Well-Rounded Education of Internet of Things engineering

Course system category		ECTS credits	The proportion	Class hours	The proportion
Professional Education	Professional compulsory courses	140	58%	4192	56.7%
	Professional experiment and practical teaching (including graduation internship and graduation design)	64	26.7%	1931	26.1%
General education	Compulsory courses	12	5%	384	5.2%
	Elective courses	7	2.9%	224	3.0%
Well-rounded education	Well-rounded courses	7	2.9%	256	3.5%
	Well-rounded practice	10	4.2%	408	5.5%
Total		240	100%	7395	100%
The practice courses (including intra-course experiment, practical teaching, independent practice, innovation and entrepreneurship practice, social practice)		74	30.9%	2339	31.6%

Appendix C4 The learning hours and credits for each module course are detailed. The percentage of credits for the modules in the entire course plan is shown in Figure 3-8. The percentage of each module credit is shown in Table 3-4.

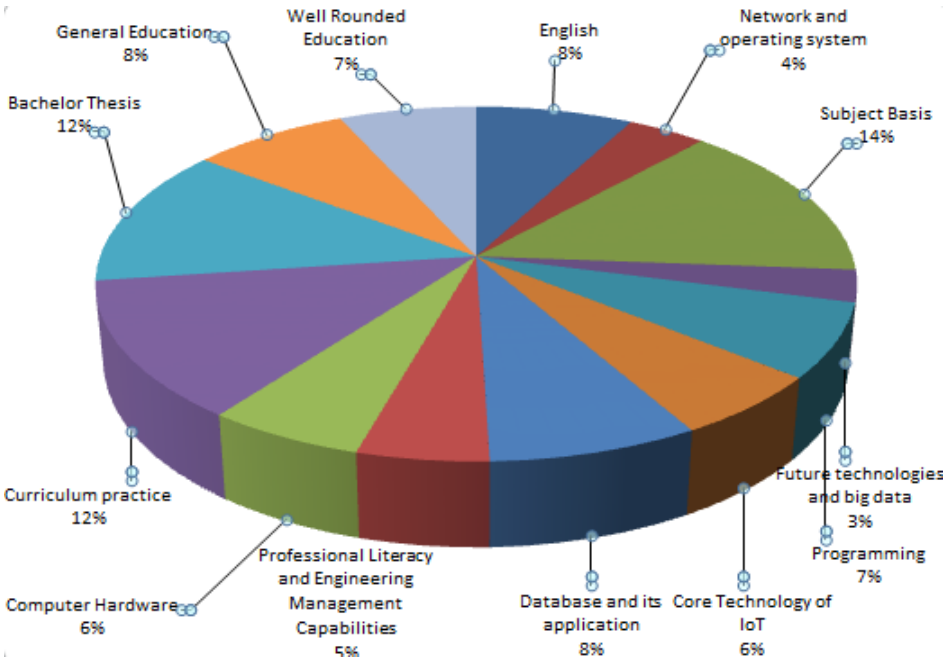

Figure 3-8 Percentage of credits for each module of Internet of Things engineering

3.2.2 Structure

3.2.2.1 Electrical Engineering and Automation professional structure

This is a four-year undergraduate course. According to the curriculum, the whole course system is divided into 15 modules. The learning content of different modules is related in time series. The Foreign Language Module mainly includes related courses such as college English which spans from the beginning of the first semester to the end of the fourth semester. The mathematics and physics courses in the Mathematical Basic Module are arranged for the 1 to 3 semesters, so that students are familiar with the basic knowledge and skills of the professional courses. The Computer Science Foundation Module consists of two courses, which are arranged in the first and the second semester. This module enables students to master the basic knowledge and skills of computer science and information technology. The Circuit Basic Module has three courses in the second and the third semester respectively to equip students with the basic knowledge of circuits and lay a solid foundation for professional course learning. The Control Engineering Basic Module is arranged in the 3-5 semesters, including automatic control theory analysis and design methods and the study of simulation tools, to lay the foundation for the follow-up professional courses. Electrical Equipment Control Technology Module includes basic knowledge of electrical equipment such as single chip microcomputer, PLC control technology and motor. This module is arranged in the fourth semester to lay the foundation for subsequent engineering applications and professional modules. Power System Basics Module is in the 5th and the 6thsemester, mainly including expertise in power electronics technology and power system analysis, to lay the foundation for research on power conversion methods. The Power Engineering Design Module is arranged in the 4-6 semesters, including electrical drawing and reading, power system relay protection and other professional knowledge. This module is the focus of the major, which lays the foundation for subsequent graduation internship and graduation design. In the engineering practice, the metalworking internship is arranged in the second semester, the electrified internship is arranged in the third semester, and the graduation internship is in the seventh semester. It is a gradual process.

The comprehensive design of the electrical course group and the comprehensive design of the power system, focusing on the innovative practice and comprehensive design of professional theoretical knowledge. The internship and graduation design (thesis) can help students accumulate a large number of practical engineering experiences and improve their employment competitiveness. The general education courses spans the first through the seventh semester to cultivate students' scientific spirit and humanities literacy, establish a foundation of natural science as well as interdisciplinary and cross-cultural foundation, equip the students to think independently and be good at questioning, develop their critical thinking, and have certain artistic accomplishment and aesthetic ability. The practice of morality, intelligence, and beauty covers the entire learning life, from the 1st to the 7th semester. Various social practice activities are carried out to cultivate students' teamwork spirit and perfect personality. In order to cultivate students' social skills and humanities from the beginning of undergraduate education, Physical education courses are arranged in the 1-4 semesters to ensure that students have enough time to exercise. The professional literacy and engineering management skills run through the first to the seventh semester to cultivate students' awareness of innovation and entrepreneurship improve their knowledge structure and cultivate leadership skills. According to the curriculum, students will eventually receive 240 credits after 8 semesters of study.

3.2.2.2 Communication Engineering professional structure

This is a four-year undergraduate program. According to the curriculum, the whole curriculum system is divided into 15 modules. The learning content of different modules is based on the basic knowledge and post-professional knowledge, in order to properly balance the learning load of students every semester, and correlate them in chronological order. In terms of credits and workload allocation for each unit, language courses and general courses are arranged in 1-4 semesters, including English, philosophy, sports, etc., to help students become familiar with English, humanities and law, meanwhile, to improve their intercultural communication skills and the humanities science skills. Courses in mathematics, physics, and computer science are scheduled for the 1-4 semesters to familiarize students with the basic knowledge and skills of the course study. The advanced mathematics are arranged in 1-2 semesters; linear algebra, probability theory, mathematical statistics and complex function courses are scheduled for 2-3 semesters; the college physics and college physics experiment courses are arranged in 2-3 semesters; the computer science foundation courses are arranged in 1-4 semesters, enabling students to master the basic knowledge of computer science and information technology and skill. The Engineering Fundamentals Module are scheduled for the 2-5 semesters and include engineering fundamentals related to circuit analysis, electronic circuits, digital circuits and logic design, signals and systems, digital signal processing, and microprocessor system architecture and embedded system design. Learning skills such as design and practice lay the foundation for professional module learning such as follow-up engineering principles and engineering applications. The Engineering Principle Module is arranged in the 1st and 5th semester. The first semester is an introduction to the communication engineering professional course. The purpose is to let the freshman enter the university, get a preliminary understanding of the major, love the profession, and have an overall planning for four-year university life. The Engineering Application Module, which is critical throughout the course system, is scheduled in the 6th semester, covering communications engineering courses. The Advanced Engineering Technology Module is scheduled for the seventh semester. This is an elective module that launches different courses for different course orientations. This module deepens and extends

the engineering application modules and can be continuously updated to students as the communication industry technology evolves and to adapt to the continuous development of the industry. The professional courses include the above Engineering Fundamentals Module, Engineering Principle Module, Engineering Application module and Advanced Engineering Technology Module. Practical training courses and bachelor thesis are scheduled for the 3-8 semesters to ensure that students can practice the exercises while learning. The subject of the undergraduate thesis is from the teacher's research project or the actual engineering project of the industrial enterprise. Internships and undergraduate thesis can help students accumulate a large amount of practical engineering experience and improve their employment competitiveness. According to the curriculum, students will eventually receive 240 credits after 8 semesters of study.

3.2.2.3 Software Engineering professional structure

The Software Engineering major is a four-year undergraduate program. The entire curriculum is divided into 15 course modules, and the learning content of different modules is related to each other in chronological order. In terms of credits and workload distribution for each unit, English, Philosophy, and Sports will be arranged in 1-4 semesters in order to familiarize students with English, humanities, and law, and improve their intercultural communication skills and humanities science; the algorithmic foundation module is scheduled for 1-2 semesters, allowing students to master the basic algorithm knowledge in the first grade and prepare for further application development; Higher mathematics, linear algebra courses are arranged in 1-2 semesters, probability theory and mathematical statistics courses are arranged in the 5th semester; university physics courses are arranged in the 2nd semester; java programming, Android application design, web dynamic web design courses are arranged in 3-5 semesters, students will master the current popular application programming technology in software engineering. The database related modules are scheduled in the third semester to lay the foundation for subsequent software engineering application modules. The Computer Hardware Principle Module is arranged in the 4-5 semesters; the network and operating system modules are arranged in the 5th semester; The Software Engineering Module is arranged in the 6th semester; The Big Data and Future Information Technology Module is arranged in the 5-6 semesters; the professional courses include the above programming, algorithm basis, java foundation and application, database technology, computer hardware principle, network and operating system, software engineering, big data and future information technology module. Internship training courses and bachelor thesis are scheduled for 5-8 semesters. The subject of the undergraduate thesis is from the actual engineering project. Internships and undergraduate thesis can help students accumulate a large amount of practical engineering experience and improve their employment competition. According to the curriculum, students will eventually receive 240 credits after 8 semesters.

3.2.2.4 Internet of Things engineering professional structure

This is a four-year undergraduate program. According to the curriculum, the entire curriculum is divided into nineteen modules, and the learning content of different modules is related to each other in chronological order. In terms of credits and workload allocation for each unit, language courses and general courses are arranged in 1-4 semesters, including English, philosophy, sports, etc., to help students become familiar with English, humanities and law to improve their intercultural communication skills. And the humanities, the Basics in Mathematics, Physics and Computer Science is scheduled for the 1-4 semesters to familiarize students with the basic knowledge and skills of the course of study, such as advanced mathematics courses in 1-2 semesters,

linear algebra, probability theory and mathematical statistics. The complex function curriculum is scheduled for 2-3 semesters; the university physics and university physics lab courses are scheduled for 2-3 semesters; the computer science foundation courses are arranged for 1-4 semesters, enabling students to master the basic knowledge and skills of computer science and information technology. The Programming Module is arranged in the first 1-3 semesters, including C language programming, C++ programming and other related programming basics, design and practice skills. The Database System Module is arranged in the 2-5 semesters, including database principles and applications, algorithms and data structures, Java programming and WEB dynamic web design courses. This module is very important in the entire course system. The future information technology is arranged in the 7th semester. This is an elective module that launches different courses for different course orientations, and can continuously provide students with updated course content as the project develops to adapt to the continuous development of the industry. Professional course of Computer Hardware Module, engineering module, core technology module, practical training courses and bachelor thesis are scheduled for 3-8 semesters. The subject of the undergraduate thesis is from the teacher's research project or the actual engineering project of the industrial enterprise. Internships and undergraduate thesis can help students accumulate a large amount of practical engineering experience and improve their employment competitiveness. According to the curriculum, students will eventually receive 240 credits after 8 semesters of study.

3.3 Workload and credits

In College of Mobile Telecommunications, Chongqing University of Posts and Telecom, 1 hour is 45 minutes, 16 hours is 1 Chinese credit, 30 hours, in the professional education sector, is 1 ECTS credit. The class consists of teaching hours, review and extracurricular assignments or experimental report writing hours, teacher counseling and answering hours, extracurricular professional knowledge, and learning time and exam review time. In the General Education and Well-rounded education section, 1 ECTS credit for 32 hours.

When Chinese credits are converted to the ECTS credits system, the average credit for a school year is approximately 60 ECTS credits or 1800 study hours (workload).

3.3.1 Study time (workload) / contact time, credits and self-study

3.3.1.1 Electrical Engineering and Automation

Credits for all modules are detailed in Appendix C1, “Curriculum Plan”. The syllabus for each course can be found in Appendix B5, “Module Manual”. Table 3-5 provides the learning time statistics of electrical engineering and its automation professional education, general education and well-rounded education. The relationship between capability structure, module and curriculum is shown in Appendix B9.

Table 3-5 Statistics of hours for Electrical Engineering and Automation Students

section	teaching hours	self-learning hours	total class hours
Professional education	1400	2308	3708
General education	608	0	608
Well-rounded education	236	0	236
Theoretical total	2244	2308	4552

section	experimental practice class-teaching hours	experiment practice self-learning hours	practice total hours
Professional education	424	1976	2400
General education	0	0	0
Well-rounded education	432	43	475
Practice class total	856	2019	2875

3.3.1.2 Communication Engineering

Credits for all modules are detailed in Appendix C2, “Curriculum Plan”. The syllabus for each course can be found in Appendix B6, “Module Manual”. Table 3-6 provides the learning time statistics of communication engineering professional education, general education and well-rounded education. The relationship between capability structure, module and curriculum is shown in Appendix B10.

Table 3-6 Statistics of hours for Communication Engineering Students

section	teaching hours	self-learning hours	total class hours
Professional education	1440	3033	4473
General education	608	0	608
Well-rounded education	256	0	256
Theoretical total	2304	3033	5337
section	**experimental practice class-teaching hours**	**experiment practice self-learning hours**	**practice total hours**
Professional education	448	1202	1650
General education	0	0	0
Well-rounded education	312	96	408
Practice class total	760	1298	2058

3.3.1.3 Software Engineering

Credits for all modules are detailed in Appendix C3, “Curriculum Plan”. The syllabus for each course can be found in Appendix B7, “Module Manual”. The corresponding diagram of capability structure, module and curriculum is shown in Appendix B11. Table 3-7 provides statistics of all modules' learning time in four years.

Table 3-7 Statistics of hours for Software Engineering

section	teaching hours	self-learning hours	total class hours
Professional education	1392	2961	4353
General education	608	0	608
Well-rounded education	256	0	256
Theoretical total	2256	2961	5217
section	**experimental practice class-teaching hours**	**experiment practice self-learning hours**	**practice total hours**
Professional education	464	1306	1770
General education	0	0	0
Well-rounded education	312	0	408
Practice class total	776	1202	2178

3.3.1.4 Internet of Things Engineering

The credits for all modules are detailed in Appendix C4, “Curriculum Plan”. The syllabus for each course can be found in Appendix B8, “Module Manual”. Tables 3-8 provide statistics on learning time, ability structure in terms of quality of professional education, general education and complete education. The corresponding diagram of module and curriculum is shown in Appendix B12.

Table 3-8 Statistics of hours for Internet of Things Engineering

section	teaching hours	self-learning hours	total class hours
Professional education	1136	3083	4219
General education	608	0	608
Well-rounded education	256	0	256
Theoretical total	2000	3083	5083
section	**experimental practice class-teaching hours**	**experiment practice self-learning hours**	**practice total hours**
Professional education	448	1456	1904
General education	0	0	0
Well-rounded education	312	96	408
Practice class total	760	1552	2312

3.3.2 Credit system

The results of learning are mainly reflected in the form of credits. After completing four years of study, students must obtain Chinese credits equivalent to 240 ECTS credits, that is, 30 ECTS credits per semester on average. Deviation of credits in different semester shall be less than 3 ECTS credits. No structural pressure should be imposed on the quality of student training and teaching level of teachers. In order to obtain the actual study workload of the student each semester, and ensure that their actual study workload is consistent with the planned workload, the head of the course shall analyze the examination results. Counselors and class teachers shall investigate students' learning time.

3.4 Education methods

The basic course of natural science is mainly taught in the form of large class (about 60 students). Professional basic courses and specialized courses are usually taught in small classes (about 30 students). Experimental classes are usually conducted in groups. Students can choose the elective modules of professional courses according to their interests and development needs. Besides classroom teaching, practice and training are also important ways for undergraduate education. Most curriculum modules have corresponding experimental and practical projects. Compared with the experimental conditions of any other university, the practice project has abundant experimental bases. Therefore, it has better experimental conditions. Each student must attend at least four weeks of comprehensive professional experiments, four weeks of projects, four weeks of innovation and entrepreneurship training. Eight weeks internship and twelve weeks for undergraduate thesis. Laboratory integrated design can be upgraded to more complex engineering project training to enhance students' ability to solve complex problems. And on the platform of school-enterprise cooperation, through visiting the actual situation of industrial production in enterprises, students can understand the operation process of complex industrial systems, process flow and equipment operation steps. Our school has a two-system Training Center certified by the Ministry of Education. Students who enter the center for study and training will receive a qualified certificate of training after graduation. The center provides about 400 training opportunities for Electrical Engineering and Automation, Communication Engineering, Software Engineering and Internet of Things Engineering professions every year.

3.5 Support and suggestions

1) Management

The school teaching management system consists of three levels: school, department, teaching and research section.

The first level: the school is responsible for the monitoring and management of university teaching quality. The principals and vice-principals are responsible for the daily work. With the assistance of the administrative department, the relevant teaching departments and functional departments, they serve the teaching process, ensure the normal operation of teaching and achieve the goal of teaching. They are responsible for major policies, plans, and major reform measures in teaching and teaching management. The school teaching steering committee will discuss and form a document, which will be examined and decided by the school administrative committee.

The Educational Administration Department is a functional department under the leadership of the Vice-President of Teaching. It is responsible for the organization and management of university

teaching. It consists of educational administration, student status management and examination center, and scientific research department. Its main responsibilities are to serve the teaching departments as well as teachers and students, to do a good job in teaching quality management plan, discipline and specialty construction, textbook construction, teaching style, style of study, and teaching system construction. The Educational Administration Department will organize the teaching arrangement and management activities of the school, and organize the examination and evaluation of teaching quality. In addition, the school establishes Teaching Supervision Office, which mainly supervises, inspects, guides and evaluates teaching, students' learning, teaching management and teaching guarantee according to the rules and regulations of teaching work, personnel training program, curriculum outline, etc.

The second level: the department is composed of organizations responsible for supervising the quality of teaching. It is mainly composed of the dean, vice dean, director of teaching and research section, and teaching secretary. According to the orientation and training objectives of the college, it is to formulate the education policy and teaching quality management regulations of each department, coordinate the management of professional teaching plans, the teaching procedure arrangements, teaching inspections and the establishment of teaching foundations and manage teaching activities of the teachers and learning activities of the students.

The third level: the teaching and research section is a grassroots teaching organization based on undergraduate majors. It is mainly responsible for professional construction and curriculum construction, and it undertakes the management functions authorized by the school. Its main task is to organize the teaching procedures of each course according to the teaching quality management objectives and teaching plans of the college and each department. These procedures include the writing of teaching materials, organization of teachers' training, teaching and research activities, teaching reform, and exchange of teaching experience, the check of the teaching quality, receiving feedback on teaching quality, supervising the implementation of teaching, standardizing, managing and assisting students' learning activities.

2) Student affairs

The Student Affairs Division is responsible for guiding and supporting students in various departments to carry out ideological and political education and management of students. This mainly includes: comprehensively advancing quality education, improving the overall quality of students, maintaining a normal teaching order and creating a good style of study; developing student management systems; guiding, coordinating and evaluating students' management work in various departments; it is also in charge of various awards, loans and subsidies for the students and is responsible for student career guidance and services. The dormitory management and student mental health education are taken care of, too.

3) Student counselor system

Each major has full-time counselors, who are responsible for life guidance and psychological counseling for college students. They are expected to build a bridge between the university and students' families, organize students to get involved in various cultural and sports activities, and provides students with a healthy, safe and vibrant learning and living environment. Counsellors will introduce professional development status and future career direction to freshman students, help them establish reasonable career goals, and think about their career plans as early as possible. Therefore, most freshmen will plan future career development in the first year of university life under the guidance of a counselor. For Sophomore and third grade students, counselors will help

them rationally adjust their career plans, improve employment targets, and lay a solid foundation for their competitiveness in the future job market. For senior students, counselors will provide up-to-date employment information, guide them in improving interview skills, provide comprehensive guidance and services for their employment, etc. For the topics that students care about, counselors would regularly organize students of different grades to exchange experiences so that the junior students can learn from the senior students. To help undergraduates participate in innovation and entrepreneurial training programs and improve students' innovative ability, the counselors will hold special skills training seminars from time to time, inviting experienced professional teachers or corporate technical personnel to teach professional knowledge and cutting-edge technologies.

4) Class tutor

Each class has a head teacher from senior classes who is responsible for providing students with professional knowledge advice and guidance. Students can choose relevant courses according to their learning situation and professional interests, participate in various exchanging activities of learning methods and experience. They can also participate in the recommendation of the head teacher.

5) Academic tutor

The academic tutoring system is carried out to guide students to better adapt to the university's learning and life, and understand the professional training specifications and requirements. They are also expected to facilitate exchanges between teachers and students, to guide students to master scientific learning methods and skills, to know student ideological dynamics, and to listen to students' opinions and suggestions, answer students' questions about their studies, majors, occupations, and life. They are also fully concerned with students in terms of ideology and learning. Academic tutors' duties are as follows:

- Do well in ideological education of students. Specialized training objectives, curriculum settings, employment orientation, etc. are used to conduct special education for students. It is to help students understand the relevant professional training specifications and requirements, and cultivate students to enhance professional learning interest and professional self-confidence.
- Instruct students to make academic plans and supervise the implementation of them. Guide students to develop mid-and-long term learning plans based on their foundation and interest in learning, help students establish further development goals for further study, employment or entrepreneurship, and guide students to gradually implement academic planning and learning plans.
- Instruct students in professional learning. Guide students to correct their learning attitudes and develop good study habits; introduce the latest developments in professional aspects and cutting-edge technologies.
- Care about students, help students and handle their puzzles. Help students with learning problems in looking for the direction of their efforts and propose improvement measures; help students who are downgraded and relegated in formulating plans for revising courses, and guiding students to graduate successfully.

4 Examination system, conception and organization

4.1 Methods of examinations

Course examination is carried out according to the course examination management regulations of College of Mobile Telecommunications, Chongqing University of Posts and Telecom. The specific form of examination is based on overall talent training goals and programs of College of Mobile Telecommunications, Chongqing University of Posts and Telecom.

- The form of exam for theory courses should be written examination unless special instructions are given. The assessment form of experimental courses and practical courses are documental reports.
- The forms of examination are determined by the teaching unit of the course. The examination form of one course should be the same in principle despite majors, nature of courses and hours of courses.
- According to the different nature of the course, the assessment methods can be divided into closed-book, open-book, oral examination, practical operation, large-scale homework, computer examination and so on. Graduation practice, graduation design (thesis, report) and other teaching links are scored by five-level system (excellent, good, medium, pass, fail). The score of other courses is 100% in principle, and 60 points and above are qualified.

For the reasons of students to prepare for exams, examinations are usually arranged at the end of each semester. Some elective courses can be arranged by teachers themselves, but all the courses should be completed within the same semester. The examination methods of each course are clearly stated in the course, so students can know the examination methods of the course when choosing the course.

In the student files, the teacher records the results of the course evaluation with a total score. The total score consists of scores of daily performance and final paper scores. Scores of daily performance are based on attendance, homework, tests, etc. In principle, in a course without experiments, scores of daily performance account for 30% of the total score, and final paper scores account for 70% of the total score of the course. Only when the comprehensive score is above the qualified level can the corresponding course credits be obtained. The student's sports performance evaluation emphasizes the process management, and comprehensive assessment is based on attendance, in-class teaching, extracurricular exercise activities and physical health. Students who fail should re-learn the course. Students who are unable to participate in physical education due to physical reasons shall be subject to the relevant regulations of the school.

The overall assessment of the student curriculum uses a grade point system, which provides student’s academic transcripts in Appendix N1,N2,N3,N4. Appendix E and Appendix F provide a method for conversion between course evaluation results and grade points.

In the eighth semester, there are 12 weeks of graduation design. Students need to complete the task of graduation design and write graduation thesis independently under the guidance of their tutors. Students who do graduate design outside school need to keep in touch with their tutors. At least once a week, the student reports the progress of his thesis in written form to ensure that his progress is consistent with that of other graduate students. A bachelor's thesis will be submitted to a specific teacher for review after it is checked by anti-plagiarism system and only when the reviewing teacher thinks that it is qualified for defense, the student and his or her thesis can take

part in thesis defense. Only if the above three stages of examination are successfully passed, will the student's thesis be qualified.

4.2 Organization of college examinations

The exam will be organized in accordance with the examination management measures of College of Mobile Telecommunications, Chongqing University of Posts and Telecom, and the exam regulations can be found in Appendix E. The specific regulations are as follows:

- Student management regulations of College of Mobile Telecommunications, Chongqing University of Posts and Telecom.
- Regulations on curriculum examination management of College of Mobile Telecommunications, Chongqing University of Posts and Telecom (Trial).
- Rules for calculating students' scores of daily performance of College of Mobile Telecommunications, Chongqing University of Posts and Telecom.
- Rules for supplemental Exam, retaking course and delayed exam of College of Mobile Telecommunications, Chongqing University of Posts and Telecom.
- Procedures for handling disciplinary violations in examinations of College of Mobile Telecommunications, Chongqing University of Posts and Telecom.
- Opinions on the implementation of graduation project (Thesis) for undergraduate students of College of Mobile Telecommunications, Chongqing University of Posts and Telecom.
- Management of graduation practice of College of Mobile Telecommunications, Chongqing University of Posts and Telecom.
- Specifications for paper-examination of College of Mobile Telecommunications, Chongqing University of Posts and Telecom.
- Implementation details of bachelor's degree awarding of College of Mobile Telecommunications, Chongqing University of Posts and Telecom.

5 Resources

5.1 Teaching staff

5.1.1 Composition of teachers

5.1.1.1 Teachers of Electrical Engineering and Automation

There are 36 full-time teachers in electrical engineering and automation specialty, including 1 senior and 7 vice-senior professional titles, and 22% of them are senior professional titles. There are 29Teachers with master's degree, 80.6% with master's degree or above, and 14 teachers with working experience in R&D institutions and enterprises, accounting for 38.9%. Most of the full-time teachers graduated from electrical information specialty and similar majors. This teaching team can meet the needs of teaching and scientific research in electrical engineering and automation. The resumes of all teachers are available in Appendix A2.

5.1.1.2 Teachers of Communication Engineering

There are 50 full-time teachers majoring in Communication Engineering Specialty, including 3 senior teachers and 17 vice-senior teachers. 40% of them are senior teachers. Among the teachers in this major, there are 42 teachers with master's degree, 19 teachers with experience in R & D institutions and enterprises. Teachers with master's degree or above accounted for 84%, with 38% of teachers working in research institutes and enterprises. The college has established a highly qualified teaching staff with a high level of teaching ability. In terms of title, age and education, a relatively stable “double qualification” teacher team is established. The resumes of all teachers are available in Appendix A3.

5.1.1.3 Teachers of Software Engineering

There are 40 faculty members, including 1 professor, 10 associate professors/senior engineers, and the proportion of senior titles is 27.5%. There are 40 teachers with master's degree or above, accounting for 100%. The college has established a highly qualified teaching staff with a high level of teaching ability. As an applied undergraduate college, the college pays special attention to “double qualified” teachers. There are 20 teachers with “double-type” titles, accounting for 50%. In terms of professional titles, ages and academic qualifications, a high-quality, relatively stable “double-type” teacher team with scientific and rational structure has been established. The resumes of all teachers are provided in Appendix A4.

5.1.1.4 Teachers of Internet of Things Engineering

The faculty of the Internet of Things Engineering is of a reasonable structure, strong and energetic. At present, there are 26 full-time teachers in this major, including 1 professor, 6 associate professors, 14 lecturers and 5 assistant professors, 2 doctors and 20 masters. In addition, there are 10 teachers in the profession who have the title of “Double Teacher”. Most of the teachers' majors are Internet of Things Engineering majors and similar majors. Now they have formed a teaching and research team with professional titles, academic qualifications, age, reasonable discipline structure and good development trend, which can meet the needs of teaching and research work of Internet of Things Engineering. The resumes of all teachers are provided in Appendix A5.

5.1.2 Research and development of teachers

5.1.2.1 Electrical Engineering and Automation

In recent years, many teachers in electrical engineering and automation have presided over or participated in the research and development of teaching reform projects at various levels. In the

past three years, the teachers have presided over 2 teaching reform projects of Chongqing Municipal Education Commission, 4 scientific research projects of Chongqing Municipal Education Commission, 5 school-level teaching reform projects, more than 20 teaching research papers and 6 professional teaching materials. Please see Appendix D1 for details. In addition, They instruct students to participate in the "Blue Bridge Cup" national software and information technology professional talent competition, "Siemens Cup" National University Students Industrial Automation Challenge, Chongqing "Hetai Cup" college students single-chip application design competition and the national university students "NXP Cup". The smart car competition won more than 30 provincial and ministerial level and above science and technology competition awards. Please see Appendix O1 for details.

5.1.2.2 Communication Engineering

There are more than 30 professional courses in communication engineering, not only for undergraduates in this major, but also for other majors in communication and IoT engineering as well as students in related fields. In recent years, the training program has opened more than 10 advanced technical courses. Several teachers have also presided over or participated in the research and development of educational reform projects at various levels, published 68 research papers and published 16 textbooks.

In the past three years, there have been 1 national sub-project, 2 Chongqing-level scientific research projects, 8 municipal-level teaching reform projects, and 9 school-level teaching reform projects. Please see Appendix D2 for details.

5.1.2.3 Software Engineering, Internet of Things Engineering

Software Engineering and Internet of Things Engineering belong to the School of Big Data and Software. In recent years, many teachers have hosted or participated in the research and development of educational reform projects at various levels, published more than 40 teaching and research papers, and published 16 textbooks. Please see Appendix D3 and D4 for details. In the past three years, there have been 4 municipal-level scientific research projects in Chongqing, 4 municipal-level teaching reform projects, and 3 school-level teaching reform projects. The main provincial and ministerial research projects undertaken by BDSC in the past three years are detailed in Appendix X1. The main provincial and ministerial level teaching and research projects undertaken by BDSC in the past three years, Appendix X2. The training program provides students with more than 300 innovative experimental projects. Students participated in the National and Chongqing University Electronic Design Competition, Mathematical Modeling Competition, etc., and won several first and second prizes in provincial and ministerial competitions.

5.1.3 Teacher rated workload

The undergraduate teaching workload of each full-time teacher in the school is 192 hours per semester. Each academic year is not less than 384 hours. In addition to the necessary theoretical teaching, each teacher must also provide adequate counseling and answering, assignment correction and practical guidance. Professional teachers, students instructing innovation and entrepreneurial competition guidance and subject competition guidance, is also the reference basis for assessing teachers' work; academic instructors, each teacher must also undertake the academic guidance, study planning, after-school innovation and entrepreneurship guidance of the students in charge of the class. These are also seen as important references for employee advancement.

These measures ensure that each student receives adequate instruction and extra-curricular instruction to help them complete the courses required for the course and to acquire the skills

required for the major to meet graduation requirements.

5.2 Teacher development

5.2.1 Related training

5.2.1.1 Related training of Electrical Engineering and Automation

The school offers a variety of training opportunities for professional teachers, enabling teachers to acquire sufficient skills to teach in the disciplines of electrical engineering and automation. Related training includes:

The school arranges one month of pre-job training for new teachers each year to improve their ethics and professional skills.

The school implemented the “old and new” program, assigned the instructors, and listened to the new teachers in order to guide and promote the rapid growth of young teachers. The college encourages teachers to participate in seminars and advanced seminars, improve the professional level of teachers, and provide conference fees and travel subsidies for participating teachers. Each year, an exchange and interaction meeting with key teachers of the School of Information Science of Shanxi Agricultural University is organized to deeply explore the reform and development of professional construction and improve the quality of teaching.

Every professional teacher has the opportunity to study and study abroad. Each year, 1-2 teachers receive college funding to participate in international exchanges. In order to train teachers with “double-type”, the school sends 2-3 professional teachers to the company to work. Regularly pay basic salary and related treatment to teachers who participate in practical training.

For teachers who participate in practical exercises for enterprises, the basic wages and related benefits are normally paid, and a 50-yuan subsistence allowance is calculated on the basis of 2 hours of work per working day. Up to now, 11 teachers in this major have already worked outside in companies such as National Power Investment Chongqing Hechuan Power Generation Co., Ltd., China Silian Instrument Group Co., Ltd., Chongqing Hongyi Machinery Co., Ltd. and so on. There are 18 times that teachers practice, train, and work in companies.

5.2.1.2 Related training of Communication Engineering

The College of Communication and Internet of Things Engineering provides various training opportunities for professional teachers, so that teachers can acquire sufficient capabilities to be engaged in communications engineering disciplines development and professional teaching. These training include:

The University arranges one-month pre-work training for new teachers every year, so as to improve their moral integrity and professional skill.

The University has implemented “Young Teacher Mentoring Pilot Scheme”, which allocates mentors to those 35-year-old below young staff who are just joining College of Mobile Telecommunications, Chongqing University of Posts and Telecom and without advanced professional technical positions, and who are included into “College of Mobile Telecommunications, Chongqing University of Posts and Telecom training program for young and middle-aged teachers”, so as to promote young teachers to grow rapidly.

In order to develop the professional competence of staff, to cultivate high-level teachers with “dual-role” qualifications and international vision, and establish new “dual- role”-integrated mechanism of teachers and engineers, the school sends a certain number of teachers each year to participate in professional-related national meetings and training, and also plans to send staff aged

below 45 in this program to enterprises for practice for six months or longer, or abroad for investigation or study a month or more, It is regulated that teachers who have such experience will have priority in the evaluation of senior titles. There are 45 teachers in my department have obtained relevant certificates in various domestic conference training. Seven colleagues took part in the training of ZTE Corporation and received the certification of ZTE's equipment trainer. Nine teachers went to Chengdu vertical and horizontal intelligence control Technology Co., Ltd. to take up their training.

Every professional staff has the opportunity to study abroad. Each year, 3-5 teachers will get funding from the college to get trained and study abroad. The school encourages staff, especially young teachers to get trained and study abroad. The College of Chongqing University of Posts and Telecommunications offers funds and personnel support to encourage staff to study or get trained abroad.

There are 12 teachers who studied abroad in communications engineering, and 97times that teachers practice, train, and work in companies.

5.2.1.3 Related training of Software Engineering, Internet of Things Engineering

The School of Big Data and Software provides a variety of training opportunities for professional teachers to enable teachers to acquire sufficient skills to develop and professionally pursue software engineering. This training includes:

New teachers are scheduled for one month of pre-training each year to improve their ethics and professional skills.

The “Pilot Program for Young Teacher Mentoring System” for young teachers under 35 years of age, has been implemented, who have just joined College of Mobile Telecommunications, Chongqing University of Posts and Telecom and have no senior professional and technical positions, who have also been included in “College of Mobile Telecommunications, Chongqing University of Posts and Telecom Excellent Young and Middle-aged Teachers” to promote the rapid growth of young teachers.

A new “double-type” teacher and engineer comprehensive mechanism has been established, in order to develop the professional competence of employees, cultivate a high-level teaching team with “double-type” qualifications and international vision; and each year a certain number of teachers are sent to participate in national professional-related meetings and training. The school plans to send employees under the age of 45 to the company for one year or study abroad for one year. The instructor is required to have at least one year of business engineering practical experience, and can obtain senior professional titles. The teacher who works overseas for one year, can be awarded a professor title.

Every professional has the opportunity to study abroad. Each year, three to five teachers will receive funding from the Chongqing Municipal Education Commission for training and study abroad for one year. The college encourages employees, especially young teachers, to receive training and study abroad. The school provides funding and staff support to encourage employees to study or receive training abroad.

There are 7 teachers who have studied abroad in software engineering and internet of things engineering, and 29 times that teachers practice, train, and work in companies.

5.2.2 Related funds

The college provides multi-level, multi-form funding for professional teachers to enhance their

professional academic research and teaching capabilities. College of Mobile Telecommunications, Chongqing University of Posts and Telecom provides funding for professionals to study abroad.

In order to promote the combination of professional teachers' theory and practice, the college encourages young and middle-aged personnel to practice internships in relevant enterprises or research institutions on a regular basis. The amount of funding is 30,000 yuan per person per year, and 3-5 teachers per program will receive funding.

In combination with the reform of the school salary system, the college has taken targeted measures to improve the treatment of professional backbone teachers, encourage and strongly support young teachers in-service for master's degree and PhD, etc. In order to further stabilize the teaching team, the school has developed a series of teacher reward mechanisms.

5.2.2.1 Electrical Engineering and Automation

In the nearly three-year Prospect Million Awards Fund, the electrical engineering and automation professional teachers received Excellent department head of the College two times with a total prize of 36,000 RMB; college Prospect Distinguished Teacher one time, a total prize of 50,000 RMB; 5 teachers have won the honor of Prospect Super Teacher, with a total prize of 100,000 RMB; 10 teachers, Prospect Excellent teacher, a total prize of 100,000 RMB; 5 teachers, Teaching Excellence Award, a total of 25,000 RMB, in the Prospect Million Awards in the last three years, the total prize is 311,000 RMB.

5.2.2.2 Communication Engineering

Teachers from Communication Engineering have been rewarded with “Excellent department head” three times, with a total prize of 36,000 RMB, and “Prospect Distinguished Teacher” five times, with a total prize of 250,000 RMB, and “Prospect Super Teacher” five times, with a total prize of 100,000 RMB, and “Prospect Excellent teacher” four times, with a total prize of 40,000 RMB, and “Teaching Excellence Award” five times, with a total prize of 25,000 RMB, in the Prospect Million Awards in the last three years, the total prize is 451,000 RMB.

5.2.2.3 Software Engineering, Internet of Things Engineering

Teachers from Software Engineering, Internet of Things Engineering have been rewarded with “Prospect Distinguished Teacher” two times, with a total prize of 100,000 RMB, and “Prospect Super Teacher” once, with a total prize of 20,000 RMB, and “Teaching Excellence Award” six times, with a total prize of 30,000 RMB, in the Prospect Million Awards in the last three years, the total prize is 155,000 RMB.

5.2.3 Introduction of talents

In accordance with the requirements of the program and standardization established by the school, we will actively introduce a group of teachers with independent teaching ability and certain teaching experience to enrich the teaching staff.

1. Electrical Engineering and its Automation has introduced 17 teachers from relevant universities, enterprises and institutions in the past five years, including one with deputy senior title (senior engineers) and 6 people with intermediate titles (including engineers), and 10 assistants. 9 of the teachers have many years of college education or corporate work experience.

2. Communication Engineering: The total number of teachers introduced from relevant universities, enterprises and institutions is 20, including 10 people with deputy senior titles (including senior engineers) and 4 people with intermediate titles (including engineers) and 6 assistants; 14 teachers have many years of college education or corporate work experience.

3. Software Engineering and Internet of Things Engineering: A total of 19 teachers have been introduced from enterprises and institutions, including 5 people with deputy senior titles or above, 2 people with intermediate titles, and 12 assistants. 10 of them have many years of college education or corporate work experience. Their arrival has made the Software Engineering and the Internet of Things Engineering professional structure more reasonable.

5.3 School environment, financial and material resources

5.3.1 College of Mobile Telecommunications, Chongqing University of Posts and Telecom

College of Mobile Telecommunications, Chongqing University of Posts and Telecom was established in 2000. It is an independent college approved by the Ministry of Education and run by Chongqing University of Posts and Telecommunications. It is a full-time undergraduate college and is open to students nationwide.

The school is located in Higher Education Mega Center, Hechuan, Chongqing, with a total area of 1,354 mu (1acre for 6.07mu) and a school building area of 318,000 square meters. It consists of three Departments and six secondary schools(or colleges): Department of Optical Telecommunications, Department of Foreign Languages and Literature, Department of Management Engineering, College of Communication and Internet of Things Engineering, College of Intelligent Engineering, College of Big Data and Software, Quenching Business College, Sino-German College, College of Art and Communication, with a total of 38 majors including Telecommunication Engineering, Electrical Engineering and its Automation, etc. At present, there are nearly 19,000 students and 930 full-time teachers.

The school adheres to the spirit of "Happy teaching, Happy learning, Being creative and Entrepreneurship", with engineering majors as the mainstay, aiming at the cultivation of applied talents, featuring information science and technology, and building a trinity of "professional education + general education + well-rounded education". The training model is dedicated to cultivating talents of "application, engineering, entrepreneurship, and internationalization". The employment rate of previous graduates of the school has remained above 92%.

The school adheres to the implementation of the internationalization strategy. Following the establishment of the Sino-German Institute of Applied Technology with Anhalt University of Applied Sciences, it has signed cooperation agreements with more than ten universities in Germany and the United States. The school cooperates with foreign universities to develop joint training of undergraduate and master students and more than 100 students have been sent to study abroad, and nearly 1,000 students are preparing for further study in Germany. In 2016, the second Sino-German International Education Forum was successfully held, and more than 10 German universities and more than 60 domestic universities were invited to participate, which promoted exchanges and cooperation between Chinese and German universities.

The school has been run with characteristics and achieved 81 prizes at the provincial or ministerial level in the past four years, including the National First Prize in the National Mathematical Modeling Competition in 2011 which realized our historic breakthrough; the Campus Drama award in the third Chinese Drama Festival in 2012 (The musical drama The Graduate). Moreover, the school has been awarded more than 30 honorary titles, including top 10 outstanding independent colleges in China, top 10 brand independent colleges in China, Garden-style Units in Chongqing, Digital Campus in Chongqing, and the Advanced Collective in Employment of

Graduates from College and Technical Secondary School in Chongqing. In 2013, it was listed as the First Batch of Universities of Applied Technology Reform in China by the ministry of education. In 2014, it was awarded as the Most Comprehensive Sino-foreign Cooperative University; In 2015, it was awarded as a Typical University for Employment with Chinese Social Influence; in 2016, it was awarded as Chongqing Employment Demonstration Center and Independent College for Comprehensive Strength", which was widely recognized by all sectors of society.

5.3.2 College of Intelligent Engineering

Founded in 2006, college of intelligent engineering has 9 undergraduate majors, namely, electrical engineering and automation, automation (including the direction of 3D printing technology), mechanical design and manufacturing and automation, rail transit signal and control, mechanical and electronic engineering, measurement and control technology and instrument and architecture electrical and intelligent, vehicle engineering and robot engineering. The college plans to take advantage of the interdisciplinary integration to gradually form the "intelligent manufacturing" and "intelligent control" groups, with the existing key cultivation disciplines of "control science and engineering". Among them, "electric engineering and automation" is a special specialty construction project of Chongqing "triple action plan", which is also one of six core majors in our school's long-term key construction. And the professional development profile is shown in table 5-1.

Electrical engineering and automation and automation specialty share laboratory of electrical automation category. The total area of the laboratory is 2,346 square meters, 1370 sets of instruments and meters, total investment more than 14,361 million yuan. At present, 9 specialized laboratories have been built, including power supply and distribution laboratory, power system relay protection laboratory, ac/dc speed regulation laboratory, PLC laboratory, and 2 campus practice bases for metalworking practice and electromechanical control practice.

Table 5-1 The developing history for College of Intelligent Engineering

Time	Important marks and related projects for the development of electrical engineering and its automation specialty
2006	set up electrical engineering and automation, undergraduate enrollment began
2007	Moved to Hechuan, newly added automation specialty
2008	Added electrical engineering and automation specialty
2009	Set up machining workshop and automatic control laboratory
2010	Set up a motion control laboratory
2011	Set up PLC laboratory
2012	Electrical engineering and its automation degree awarded
2013	Electrical engineering and automation established as one of the six core majors of the school
2014	Set up electromechanical control practice base
2015	Electrical engineering and automation awarded Chongqing special specialty. Establishing school-enterprise cooperation relationship with people's government of Shuanghuai town, Hechuan district of Chongqing. and Hechuan power generation co., LTD. Establishing power supply and distribution laboratory, ac/dc speed regulation laboratory and power system relay protection laboratory

2016	Established school-enterprise cooperation with China Silian instrument and meter group co., LTD and Chongqing Hongyi machinery co., LTD. and process control laboratory.
2017	Established 3D printing laboratory and school-enterprise cooperation relationship with Beijing Kangjisen transportation technology co., LTD.
2018	Established school-enterprise cooperation relationship with Chongqing Dajiang power equipment manufacturing co., LTD

5.3.3 College of Communication and Internet of Thing Engineering（CCIoTE）

The College of Communication and Internet of Thing Engineering was established in 2005. Currently, it has 7 undergraduate majors, including communication engineering, electronic information engineering, electronic information science and technology, radio and television engineering, information engineering, telecom engineering and management, and space information and digital technology. At present, there are 50 teachers, including 3 with high professional title and 17 with deputy high professional title, and 40% with senior professional title. There are 42 teachers with master's degree, 84 percent of the total staff, 19 teachers with working experience in R & D institutions and enterprises, 35.3 percent of the total, and nearly 4000 students.

It has a specialized technical experimental training platform that has simultaneous development in correspondence and electronic information industries including electrical and electronic technology, program-controlled telephone exchange, broadband comprehensive access, network information security, optical communication network, mobile communication technology, electronic design and DSP, electronic technology and other laboratories.

In order to improve the quality of talent cultivation, the College of Communication and Internet of Thing Engineering has taken measures such as teaching students according to their aptitude and training according to their classification and set off the craze of taking part in scientific activities and graduate school examination. And closely surrounding the industry development, the school constantly explores new models of university-enterprise joint, successively establishing cooperation with ZTE, Chongqing mobile design institute, China telecom (Chongqing branch), Letter of Chongqing branch, Chengdu Cross, Yicheng technology, and so on. For many years the school has prepared a large number of senior engineering applied talents for the national and local economic development and construction. The development of the school of communication and internet of things engineering is shown in table 5-2.

Table 5-2 The developing history for College of Communication and Internet of Things Engineering

Time	**Important marks and related projects for the development of electrical engineering and its automation specialty**
2005	Undergraduate major "Telecommunication Engineering" has been set up.
2007	Electrical and electronic laboratory has been built up
2011	For synchronizing with communication and electronic information industry, professional technical training platform has been built, including program-controlled telephone exchange laboratory, broadband integrated access laboratory, network information security laboratory, optical communication network laboratory.
2012	The "Telecommunication Engineering" major was listed as the first batch of "professional comprehensive reform pilot projects" among the ordinary colleges and

	universities in Chongqing.（This is the first batch of projects initiated by the Ministry of Education and the first breakthrough in the city-level "Quality Engineering" project in the past five years. It is also the only undergraduate university which received this project in the city's independent institutions.）
2013	The "Electronic Information Engineering" major was selected into the first batch of projects for the special construction of the "Three Special Action Plan" in Chongqing.
2014	The radio and television engineering and communication engineering majors were selected into the 2014 China three-star specialty, and ranked among the top-notch professional names in 2014.
2015	Professional laboratories of electronic information have been established: electronic technology laboratory, electronic design automation and DSP laboratory 1, electronic design automation and DSP laboratory.
2016	A mobile communication 4G technology (LTE) laboratory has established.
2016	"Telecommunication Engineering" was selected as a special construction project for the "Three Special Action Plan" in Chongqing.

5.3.4 College of Big Data and Software College

College of Big Data and Software College was founded in 2018, formerly known as the Department of Computer Science. Currently it has six undergraduate majors in Computer Science and Technology, Software Engineering, Network Engineering, Internet of Things Engineering, Digital Media Technology, Data Science and Big Data. There are more than 40 professional teachers with master's degree or above and nearly 5% of them owned deputy high and above titles and 25% of them had experience in the field of engineering and R&D experience in the enterprises. Nearly 2,000 students study here.

The computer experiment teaching demonstration center is composed of computer basic laboratory, computer hardware laboratory, multimedia laboratory, computer network laboratory, CAD laboratory and other laboratories. The value of the experimental training equipment used in this major is 5 million yuan, including simulation software, projectors, servers, microcomputers, printers, scanners, multimedia, ERP sand table simulation equipment, etc. These advanced teaching and experimental instruments and equipment have met the needs of personnel training and the requirements of the training program.

In order to improve the quality of personnel training, the School of Big Data and Software has taken measures such as Teaching in accordance with their aptitude and it has set off a wave of taking part in scientific and technological activities and preparing postgraduate entrance examinations in recent years. At the same time, it closely focuses on industrial development and continuously explores a new mode of joint school-enterprise education. It has successively cooperated with many well-known enterprises such as ZTE, Chongqing Mobile Design Institute, China Telecom (Chongqing Branch), Chongqing Xinke, Chengdu Zhiheng, Survey Communication Technology of Chongqing University Posts and Telecoms, and Yicheng Technology and Chongqing Hanbo Optoelectronics. It has cultivated a large number of outstanding engineering application talents for national and local economic development. Table 5-3 shows the history and developing process the School of the Big Data and Software.

Table 5-3 The developing history for College of Big Data and Software

Time	Important marks and related projects for the development of electrical engineering and its automation specialty
2008	Undergraduate major "software engineering" has been established.
2012	Obtained the rights to grant a bachelor's degree in software engineering
2012	The computer experimental teaching demonstration center has been built composed of computer basic laboratory, computer hardware laboratory, multimedia laboratory, computer network laboratory, CAD laboratory and other laboratories.
2015	"Software Engineering" major has become a specialization major in the College of Mobile and Telecommunications of Chongqing university of Posts and Telecoms.
2017	a big data lab has been founded.
2017	Embedded training platform has been built.
2018	Department of Computer Science has upgraded to the School of Big Data and Software.

5.3.5 Laboratory system

1) Laboratory management system

- The laboratory should be kept clean and tidy. It is strictly forbidden to dress untidily, smoke, eat, spit, and litter. The laboratory should remain quiet and speaking loudly is not allowed.
- Take care of the equipment and regularly check the operation of the equipment in the laboratory to ensure the normal use of the equipment.
- Do not store dangerous articles such as flammable, explosive, pollutants, etc. in the room. Use electric heating equipment according to the rules for the sake of safety and operating equipment without anyone staying in the lab is forbidden.
- All kinds of instruments and equipment in the laboratory must be placed reasonably, and neatly, for the sake of convenience. Items not related to the experiment are prohibited from being stored in the laboratory.
- Borrowing the instrument must be approved by the laboratory responsible department, and fill out the "Laboratory Equipment and Equipment Borrowing Application Form". The person in charge of the laboratory should make a record of the borrowing instrument and when returning, check whether the instrument is working properly and whether the accessories of the instrument are complete.
- Instruments and equipment purchased with various funds must be registered. If the equipment is lost or damaged, those who are responsible for this will make compensation.
- When finish using the experimental equipment and leaving the laboratory, the experimental equipment should be restored and cleaned up. Power supplies on all the test benches should be turned off. The air conditioner and the lights should be turned off. The windows closed, and the doors should be locked to ensure safety.
- Fire-fighting facilities should be inspected regularly and placed in a safe and convenient place.

2) Laboratory safety management

- Anyone who enters the laboratory to work or study must abide by the relevant rules and regulations of the laboratory. He shall not use the equipment and safety facilities in the laboratory without authorization. He shall not smoke in the laboratory, eat or spit anywhere.
- Laboratory staff and participants must study safety regulations and safety technical procedures

carefully. Laboratory safety facilities and marks must complete and effective.

- The installation of the power supply line in the laboratory must conform to the needs of experimental teaching and the relevant regulations of safe use of electricity check regularly and maintain in time.
- The laboratory should do fire-proof, shock-proof and other work, to be equipped with fire extinguishers and other fire fighting equipment. Laboratory staff should learn to use fire extinguishers.
- It is strictly prohibited to bring dangerous materials such as flammable explosive and contaminant into the laboratory without authorization. When the relevant items are used for work the responsible department of the laboratory, we shall appoint a special person to take charge and manage them properly.
- Laboratory should take anti-theft measures to strengthen security work; non-laboratory staff shall not enter the laboratory.
- The teacher (or learner) who leaves the room at the end of the day shall be responsible for checking the closure of the facilities such as water, electricity, doors and windows to ensure that they are safe and correct before leaving the room. Before the holidays, the staff in the building should carry out safety inspection and make a good record.
- Once the fire, water situation, theft, we should immediately report to the school security department and higher authorities, and take appropriate measures.

3) Experimental teacher's duty

- Teachers should strictly abide by the laboratory management system.
- Teachers should be familiar with laboratory environment and operation of laboratory equipment in advance, check the integrity of laboratory equipment before class, and carry out safety education.
- All experimental teachers shall not be late, leave their posts, or engage in affairs not related to experimental teaching; otherwise they shall be dealt with in accordance with the relevant regulations of teaching accident management methods.
- The teachers of the experiment class have the duty to solve the problems in class, deal with the problems in the course of the experiment in time, and ensure the normal and smooth teaching.
- It is strictly forbidden to disassemble and refit the equipment without the consent of the responsible person in the laboratory. It is strictly forbidden to change the power line and network privately. Once found, the equipment shall be dealt with according to the general teaching accident.
- The laboratory teacher shall assist the responsible person of the laboratory and the responsible department of the laboratory in the management of the laboratory. The damage and loss of the equipment caused by the experiment should be recorded in time, and the serious cases should be investigated for compensation.

4) Student experimental code

- Student should observe the rules and regulations of the laboratory, be civilized, polite, do not speak loudly, do not spit anywhere, do not throw paper scraps and sundries, do not smoke, do not wear slippers and do not bring food into the room, ensure that the laboratory has a good working order and environment.
- Before the experiment, we must prepare the experimental instruction book, define the purpose of the experiment, understand the principle, steps and methods of the experiment, enter the

laboratory in advance on time, and count the experimental instruments.

- The student experiment must be carried out in the designated position with the permission of the instructor, and the operation rules of the laboratory should be strictly observed in the course of the experiment, and it is strictly prohibited to use the experimental equipment and other indoor equipment which have nothing to do with this experiment, so as to ensure the safety of the experiment. The students should record the original experimental data carefully, do not concoct or copy each other, and strive to develop their ability to conduct scientific experiments independently.
- The students should take good care of experimental instruments and equipment and save experimental materials. In case of abnormal situation in the course of the experiment, the instructor should report to the instructor immediately and obtain help. If the operation rules are violated, the instructor shall have the right to stop the experiment. Damage, loss of equipment and equipment should be reported to the guidance teacher, and according to the circumstances of accountability, according to the relevant provisions compensation.
- At the end of the experiment, the original recorded data must be signed by the instructor. According to the guidance teacher's request, we should arrange or return the instrument and equipment, make the use record, cut off the power supply, arrange the laboratory table top and indoor hygiene, and then leave the laboratory only after the instructor's approval.
- The students should summarize the experimental situation carefully, finish the report independently, and send it to the instructor on time.

5.3.6 Professional laboratory

5.3.6.1 Laboratory of Electrical Engineering and Automation

Electrical engineering and automation professional laboratories include metalworking practice, electrical installation practice, electromechanical control practice base, motion control laboratory, automatic control laboratory, embedded system laboratory, programmable controller laboratory, etc. It also include power supply and distribution laboratory, power system relay protection laboratory, AC / DC speed control laboratory, measurement and control laboratory, 3D printing laboratory and other teaching experimental platform. Among them, the electromechanical control practice base is equipped with 64 sets of equipment, including loading and testing unit, handling unit, processing and testing unit, handling and sorting unit, frequency conversion transmission unit, installation unit, etc. The control system is composed of eight units, such as moving unit and classification unit. The control system is controlled by Siemens PLC, which has good flexibility, and each unit module can complete the corresponding module experiment. It can also connect multiple modules to realize the control, programming, assembly and debugging of complex systems. It is more advanced in domestic colleges and universities, and can complete experimental teaching, comprehensive training, graduation practice and graduation design, experiments of many courses. There are more than 40 practical training projects. For additional information on more laboratories, look at Appendix H1.

1) Fundamental laboratories

- Physical laboratory

Principle and use of oscilloscope, Hall effect, Wheatstone bridge resistance, electrostatic field simulation, AC bridge experiment, study on RLC series circuit transient characteristics, Doppler effect experiment.

- Fundamental laboratory of circuit analysis

Surveying and mapping of volt-ampere characteristics of circuit elements, experimental study of controlled sources, verification of superposition principle and verification of Thevenin's theorem.

- Fundamental laboratory of electronic circuits

Transistor common emitter stage single-transistor amplifier experiment, emitter follower experiment, experiment of the basic application of integrated operational amplifier and negative feedback amplifier experiment.

- Laboratory of digital circuits and logic design

Basic knowledge of digital signal, design of combinational logic circuit-adder, design of combinational logic circuit-decoder, design of combinational logic circuit-data selector, design and test of trigger circuit, design and test of sequential logic circuit-asynchronous counter, design and test of sequential logic circuit-synchronous counter Design and test of pulse unit circuit -555 time base circuit and its application.

- Basics of graphics and computer graphics laboratory

Basic Operation of AutoCAD, establishment and insertion of attribute block, drawing of three views of combination body and modeling and editing of three-dimensional entity.

2) Professional laboratories

- PLC Laboratory

Programming exercises of basic instructions, water level simulation control of water tower, LED digital display control and simulation of liquid mixing device control.

- Motion control laboratory (motor and drag control)

DC motor control experiment, DC generator test, transformer test and three phase asynchronous motor control.

- Motion control laboratory (power electronics technology experiment)

SCR, GTO, MOSFET, IGBT, GTR characteristic experiment, single-phase parallel inverters trigger circuit experiment, single-phase half-wave controllable rectifier circuit experiment and single-phase AC voltage regulation circuit.

- Automatic control laboratory

Simulation of typical linear link, step response of second-order system, stability of linear system and frequency response of second-order system.

- Power supply and distribution laboratory

Cognitive of electrical wiring diagram of plant power supply system and on-duty skill training of transformer and distribution room, microprocessor relay protection training of plant high voltage line, relay protection of high voltage motor and automatic device training of plant power supply system.

- AC and DC speed regulation laboratory

WINCC industrial control configuration software programming experiment, full digital DC drive single machine control experiment, PLC based on PROFIBUS-DP communication mode, distributed I/O and PLC control converter external terminal motor forward/reverse control.

- Power system relay protection laboratory

Characteristic experiment of electromagnetic current, voltage and time relay, characteristic experiment of GL-15 overcurrent relay, conventional protection experiment of current and voltage of transmission line and computer protection of current and voltage of transmission line.

- Measurement and control laboratory

Metal foil strain gauge experiment; differential transformer experiment; Labview software

experiment and temperature sensor.

3) Training bases

- Metalworking practice base

Providing internship practice of machining: basic knowledge of machine tools, using a Bull-Head planer to process a plane of hammer; using fitter tools such as: file, saw, tap, plate teeth, table drill to learn to process plane, surface, thread, and complete the production of a complete metal hammer according to the requirements of the drawings.

- Electrical installation practice base

Making low-power speakers, identifying and correctly using common electrical components; understanding simple electrical schematic diagram and circuit board installation diagram; mastering manual welding and assembly technology; learning and mastering the methods and steps of making and debugging simple electrical devices; debugging methods and procedures; learning the simple electrical device failure analysis and simple fault elimination.

- Electromechanical Control Practice Base

Setting up cognitive experiment of micro flexible processing system, design experiment of electrical control circuit of feeding detection unit, program design and debugging experiment of feeding detection unit, design experiment of electrical control circuit of handling unit, debugging experiment of pneumatic system of handling unit, program design and debugging experiment of handling unit, electrical control of installation unit Eight experiments of circuit design experiment, installation unit programming and debugging experiment.

5.3.6.2 Laboratory of Communication Engineering

The College of Communications and Internet of Things has set up electrical and electronic laboratories, basic laboratories of electronic information specialty and specialized laboratories of electronic information specialty. Among them, the basic laboratory of electronic information specialty is composed of signal and system laboratory, communication principle laboratory and single chip computer laboratory. The Laboratory of electronic information specialty is composed of transmission laboratory, exchange laboratory, broadband network laboratory and wireless sensor laboratory. Through careful maintenance and timely updating of experimental equipment, it ensures that students majoring in CCIoTE can set up basic circuit experiment, analog circuit experiment, digital circuit experiment, signal and system experiment, basic communication technology experiment, electronic circuit course design, information acquisition course experiment and single chip computer course design.

During the three-year period from 2013 to 2016, four new professional laboratories were built: Electronic Technology Laboratory, Electronic Design Automation and DSP Laboratory 1, Electronic Design Automation and DSP Laboratory 2, Mobile Communication Technology Laboratory. A total of 849 sets of teaching experimental equipment (including software) were purchased, with a total investment of 8.215 million yuan. It mainly undertakes the teaching tasks of communication engineering and related majors, such as professional experiment, cognitive practice, graduation practice and graduation design.

Laboratory safety education: “Laboratory safety education and operating procedures” are posted in all laboratories. Students must complete safety education and training before entering the relevant laboratories. Those who do not meet the relevant requirements are not allowed to enter the relevant laboratories. For additional laboratory information, please refer to Appendix H2.

1) Basic Laboratory

- Signal and Systems Laboratory

It mainly teaches the design and test of common RC network (low-pass circuit), the design and test of common RC network (high-pass circuit), the design and test of common RC network (RC frequency selective circuit), and the design and test of RC network (double T bridge band-stop circuit).

- Basic laboratory of circuit analysis

Students are supposed to learn the mapping of the volt-ampere characteristics of circuit elements, the experimental study of controlled sources, the verification of superposition principle and the verification of Thevenin's theorem.

- Electrical installation laboratory

Teachers are supposed to Instruct students to make low power small speakers. Students should be able to identify and correctly use common electrical components, understand simple electrical schematic diagram, circuit board installation diagram; to master manual welding and assembly technology, learn and master the production of simple electrical devices, debugging methods and procedures and learn the fault analysis of simple electrical devices and simple troubleshooting.

- Basic laboratory of electronic circuits

Teachers instruct students to complete the experiments of transistor common emitter amplifier, emitter follower, integrated operational amplifier and negative feedback amplifier.

- Digital circuit and Logic Design Course Design Laboratory

In accordance with the assigned curriculum design topics, students analyze topics and find relevant information. Students design circuit diagrams according to the requirements of the topic, explain circuit diagrams to teachers and collect relevant materials, and construct circuits in laboratory boxes or breadboards according to circuit diagrams. According to the circuit diagram in the laboratory box or breadboard for circuit building, students independently find the problems and faults of the circuit, according to the circuit diagram in the laboratory box or breadboard for circuit building. Under the guidance of the teacher, students look for problems and faults in the circuit. Teachers examine students' practical results.

- Digital circuit and Logic Design Laboratory

Teachers instruct students to complete the basic understanding of digital signals, the design of combinational logic circuits-adders, combinational logic circuits-decoders, combinational logic circuits-data selectors, trigger circuits, sequential logic circuits and test-asynchronous counters, sequential logic circuits. Design and test of synchronous counter, pulse unit circuit and test -555 time base circuit and its application.

- Communication technology foundation Laboratory

The experiments of high frequency small signal tuned amplifier, LC and crystal oscillator, amplitude modulation and diode detection, frequency modulation and quadrature frequency discrimination, digital phase locked loop, analog multiplier mixer, FSK modulation and demodulation, time division multiplexing and demultiplexing are summarized.

- Curriculum design of microprocessor system structure and embedded system design

Teacher should ask students to complete a comprehensive and applied development topic involving the course within the prescribed time. Firstly, the design topic is arranged and explained. Then, students consult the relevant information and design the project by themselves, and complete the code compilation and hardware connection. Finally, the program is downloaded and debugged

successfully to meet the functional requirements of the topic.

- Microprocessor system structure and embedded system design experiment

Teachers guide students to complete skilled use of Keil software platform, I/O port (1) experiment, I/O port (2) experiment, table look up instruction experiment, interrupt experiment (1), interrupt experiment (2), timer experiment, 0-60 second timer, ARM development environment experiment, ARM serial communication experiment, real-time clock experiment and watchdog experiment.

2) Professional Laboratory

- Mobile Communication Technology Laboratory

Through the introduction of the composition and function of laboratory equipment, students' understanding of LTE communication theory and equipment networking applications will be deepened. It is designed to develop students' practical capability and skills. It mainly introduces the operation software usage and specific operation steps of mobile communication network optimization and network planning, the use and actual operation of TD-LTE simulation software, the core equipment of LTE and the network management configuration of LTE. Students will master the workflow of mobile communication network optimization, hardware equipment installation in TD-LTE simulation software. They are required to independently complete the TD-LTE network management configuration operation and experiment with normal calls between the two ZTE 4G mobile phones.

- Network Security Technology Lab

It mainly introduces the core device of VLAN and its network management configuration, the use of routing exchange simulation software and the actual operation and operation software use and specific operation steps. This will cultivate students to independently complete the switch configuration operation and experiment with normal data exchange between the two terminals. And it can train students to master the hardware device connection in the switch simulation software and master the workflow of the VLAN.

- Modern Exchange Principle Laboratory

Through the introduction of the architecture and function of the program-controlled exchange laboratory equipment, and the data configuration of the switch through actual operation to realize the telephone service, all can deepen the students' understanding of the exchange theory and the working principle of the program-controlled switch, aiming to cultivate the theoretical connection between students and hands-on ability. Students will have a deeper understanding of the role of switching in the communication network, understand the hardware structure and composition of the program-controlled switch, and master the hardware configuration of the program-controlled switch and be familiar with the functions of each board.

Be familiar with the setting of the configuration data, prefix, and user data of the B-type module of the PBX. The students must know the configuration of the local call data of the switch.

- Broadband Access Technology Experiment

Through the introduction of the composition and function of the laboratory MA5600 equipment, students can systematically apply the basic theories involved in theoretical teaching to the equipment provided by the training, and provide students with the necessary solutions to solve practical problems in the future work environment. Indispensable experience support. The lab is designed to develop the actual operation and application of the MA5600. It is mainly used to describe the system architecture and networking of the MA5600. The MA5600 is used to configure

the MA5600.

- Optical Fiber Communication Technology Experiment

The lab is designed to develop students' practical and practical skills. It mainly introduces the engineering application of SDH service configuration, instrument OTDR and BER tester, and strengthens the mastery of basic theoretical knowledge. The SDH ring network management configuration operation can be completed independently, and the experiment requires the provision of point-to-point 2Mb/s services. Students can master the BER test for 2Mb/s bit error test and the use of optical time domain reflectometry to determine fiber fault points.

- Electronic Information Technology Application Development Studio

Our school and Chengdu Zongheng Zhikong Technology Co., Ltd. jointly established the "Electronic Information Technology Application Development Studio" for students to participate in internships, practice, teacher practice, joint development of products with enterprises, application of scientific research projects, studio practical experience. Rich and hands-on enterprise technicians participate in the competition and professional-related competitions at all levels and in all kinds of colleges, such as: SCM design competition, National Undergraduate Electronic Design Contest, FPGA Design Contest, etc., while undertaking a certain amount of graduation design (thesis) Guiding work. In the 2016 graduation design (thesis) guidance work, there were 6 corporate technicians involved in guiding 39 students.

- Electronic Technology Laboratory

The laboratory is equipped with CNC engraving machine, thermal transfer equipment and chemical industrial plate making equipment, which can complete the whole process from drawing PCB layout to preparing single panel and double panel.

The laboratory is mainly a supporting laboratory for the comprehensive design of electronic systems. It mainly allows students to complete the design of electronic systems of a certain scale after learning the AD10 (Protel) drawing software, and complete the processes of plate making, welding and debugging in the laboratory. Finally, a prototype of an electronic product with certain practical functions was prepared. The laboratory is also a training base for the University Electronic Design Competition and an integral part of the Innovation Lab of the School of Communication and Internet of Things. It focuses on cultivating college students' innovative consciousness and hands-on practical ability.

- Electronic Design and DSP laboratory

The lab is equipped with an integrated test platform for electronic devices and systems that integrates an oscilloscope, signal source, multimeter, millivoltmeter, DC power supply, and various transformers and multi-function sockets. At the same time, the laboratory is equipped with an analog circuit experiment box, a digital circuit experiment box, an EDA experiment box and a DSP experiment box.

The laboratory mainly completes the teaching of electronic technology integrated design, electronic design automation (programmable logic device) experiment and course design, digital signal processing experiment and DSP chip technology. The lab is also a training base for the University Students Electronic Design Competition and an integral part of the Innovation Lab of the School of Communication and Internet of Things. It focuses on software design, hardware development, and software and hardware integration to enhance students' innovative awareness and hands-on practical skills.

5.3.6.3 Laboratory of Software Engineering and Internet of Things Engineering

For additional laboratory information, please refer to Appendix H3 and H4.

1) Fundamental Laboratory

- Laboratory for Office Automation

The basic teaching requirement is to help students grasp basic knowledge of microcomputers (including computer virus prevention and control); to be familiar with the basic functions of Windows operating system; to be familiar with the basic knowledge of Microsoft office software and proficient in at least one Chinese character (keyboard) input method with typing speed of 30 or more words per minute; to be proficient in the basic operation and comprehensive application of Microsoft office software, especially in using Word 2010 to arrange, on a comprehensive scale, various objects as text, table and graphic art characters, and to put long Word files into layout of complex structure; to grasp the basic knowledge of Excel software, and proficient in the basic operation and comprehensive application, typically using Excel 2010 for complex data analysis and processing; to know basic knowledge of PowerPoint software and be adept at its comprehensive application; to be familiar with the operation and maintenance of modern office equipment (fax machines, scanners, printers, copiers, etc.); to be able to gain access to and make research on network resources.

- Laboratory for Basic Application of Database Technology

The aim of using the lab is to instruct students to understand the basic knowledge of relational database system and the basic theory of database design and standardization; to master the basic process of SQL Server 2008 installation and the use of the main components of SQL Server Management Studio after installation; to be skilled at establishment and management of user database in SQL Server Management Studio; to understand the basic architecture of the SQL Server 2008 database and the role of the system database; to understand the basic concepts of table in the SQL Server 2008 database, the concept of data integrity and its application; to be proficient in the establishment of user tables, constraints, in modifying the structure of the user tables, inserting, deleting and modifying data in tables and deleting tables; to familiar with the basic statements of Transact-SQL, to be proficient in using commands and query statements for table creation, table insertion, deletion and modification; to be able to build ASP development environment and understand the composition of ASP built-in objects and ASP code; to master the method of connecting ADO objects with code, to be good at insertion, deletion, modification and query of data in ASP page using connection objects; to understand the concept of indexing and view and master its establishment and methods of application; to understand the basics of T-SQL programming, various process control statements, and the use of cursors; to be skilled in the creation, modification, execution, and deletion of stored procedures, and the creation and use of another special types of stored procedure triggers; to master skills in database backup and recovery, data import and export, and system security management; to understand the basic knowledge of database application development, to master the basic steps and methods of database application project development.

- Laboratory for C/C++ Design and Development

The course requires students to master the features of C++ language, to be skilled in using C++ advanced grammar, compiler principles, C++ object-oriented, standard library, pointer and exception handling, C++ advanced debugging, I / O processing; C + + graphics processing and STL standard library.

- Laboratory for Algorithm Integrated Design

Through experimental training in the laboratory, students should meet the following requirements in terms of data structure basic knowledge, common data structure analysis and design, algorithm implementation and optimization, and recognition of classical algorithms: 1. Students are to be able to describe technical terms of the data structure and summarize the concepts of logical and physical structure, and analyze the time complexity of the algorithm. 2. Students can summarize and analyze the data characteristics of linear logic structure, tree logic structure and graph logic structure, and skillfully write algorithms to solve related problems in physical structure. 3. Students can, with different data characteristics in mind, be skilled in sorting and search algorithms and analyze and summarize the pros and cons of a specific algorithm. Furthermore, they can complete the analysis and resolution of classic problems and be proficient in 3 to 5 classical algorithms.

2) Professional laboratory

- Laboratory for Mobile Application Game Development

It aims at putting students on track of developing games on IOS 5, Android, and Windows Phone 7. The course focuses on game developing procedures; technologies involved; game design; animation, dot matrix; artificial intelligence. creating frame buffers and entities; game testing and release.

- NET Laboratory

The lab helps students improve, systematically and rapidly, the level of .Net architecture design. Students are to be proficiency in .NET development architecture, effective operation and maintenance of .NET, to improve the overall developing ability and to be practically able to develop and apply programs based on .NET platform.

- Laboratory for JAVA EE Design and Development

The lab enable students to grasp the basic knowledge and skills in enterprise-level R & D on the JAVA platform, including java language and grammar, class library commonly used in java R & D, object-oriented design and programming concepts, multi-threaded programming on java platform; network programming on java platform; programming of java platform database.

- Laboratory for Network Technology Basics

Through practical training, students will be able to master the theoretical knowledge and operation of network technology, and be able to design, construct, operate and maintain computer information systems. They are to be equipped with network hardware knowledge, basics of system development, network security, standardized knowledge, information basics, requirements in system design, network platform operation management, network system implementation technologies, and new network technologies.

- Laboratory for Network Operating System

The lab trains students in network operating system and Windows Server 2003. Students are required to be skilled in managing network service components such as NTFS file system, DNS and DHCP, active directory, group policy, data storage and system security; to effectively use Windows Server 2003 system maintenance tools; to master the configuration and management methods of Windows Server 2003 printing system; the configuration and management of Internet information server in Windows Server 2003; to understand Windows Server 2003 streaming media service;

- Professional Laboratory for Computer Organization and Structure

Through experimental training, students can understand the basic concepts, components and functions of computers. Students are equipped with basic knowledge of software and hardware by

discussion of the mechanisms of the components and control units. In particular, students will grasp the methods of building an organic and complete computer system by connecting the basic components, thus laying a foundation for cultivating students' ability to analyze, design, develop and use computer systems.

5.3.7 Platform for international exchange and cooperation

In 2009, we started admitting students jointly with Heidelberg University of Applied Sciences in Germany. In cooperation with the University of Applied Sciences in Anhalt, Germany, we founded the Sino-German Institute of Applied Technology, the only institution in Southwest China that cooperates with German universities.

At present, the college has signed agreements in international cooperation with the following German universities, namely, Heidelberg University of Applied Sciences, Mitte Vedeta University of Applied Sciences, North Hessen University of Applied Sciences, Lausitz University of Applied Sciences, Ham-Lippstadt College, Essen Economic Management Application Technology Universities, Anhalt University of Applied Sciences, Fukwangen University of the Arts, Dresden University of Technology and Duisburg-Essen University, offering programs ranging from master, undergraduate double degrees, Sino-German seamless education program and preparatory courses for international undergraduate, covering communications engineering, electrical engineering and automation, business management and other dozens of key majors.

More than 400 students have been successfully sent to the cooperative universities in Germany and nearly 1800 students are preparing to go to Germany. There are more than 10 foreign language teachers in the college. In addition, several professors are sent to teach major courses by the German cooperative universities every semester. Other courses are taught by professors and doctorates with high professional level and strong teaching ability in departments of the school, and the teaching quality is excellent. At the same time, our college also receives more than ten foreign students from German universities every year, and it also appoints and subsidizes more than ten outstanding teachers and students to study and exchange in Germany every year.

5.3.8 Platform for cooperation between college and enterprise

5.3.8.1 Electrical Engineering and Automation

In order to better integrate teaching with practice and improve students' engineering practice ability, after many years of efforts, this major has established a long-term and effective cooperation with China Four Instruments Group Co., Ltd., Hechuan Power Generation Co., Ltd. In Chongqing, Chongqing Hongyi Machinery Co., Ltd. and Beijing Kangjisen Transportation Technology Co., Ltd. to facilitate students to complete internship and graduation design (thesis). At present, substantial school-enterprise cooperation has been carried out: " Shuanghuai Town Practice Base of College of Mobile Telecommunications, Chongqing University of Posts and Telecommunications" has been established in Shuanghuai Town, Hechuan Power Generation Co., Ltd. of Chongqing State Electricity Investment Corporation, China Four Instruments Group Co., Ltd., Chongqing Hongyi Machinery Co., Ltd., Beijing Kangjisen Transportation Technology Co., Ltd. has established "off-campus practice base of College of Mobile Telecommunications, Chongqing University of Posts and Telecommunications" to form a virtuous circle and sustainable practice mechanism. Eleven teachers have taken part in the training of enterprises to be trained as "double qualified" teachers. Some of the students are guided by the enterprise engineers in graduation design, and carry out professional practice and graduation practice in enterprises. The goal of letting students know enterprises and letting enterprises know students has been achieved, the recognition of

students has been improved, and the "win-win" mode among students, universities and enterprises has been realized. Please refer to appendix P1 for part of the cooperation agreement signed.

5.3.8.2 Communication Engineering

CCIoTE has established a number of relatively stable internship and training bases which meet the training objectives of electronic information talents and meet the professional needs. Through school-enterprise cooperation, 10 new off-campus practice bases are added on the basis of the original off-campus practice base, as shown in Table 5-4.

Table 5-4 School-enterprise cooperation enterprises in communication engineering

No.	Enterprises Names
1	Chengdu Longitudinal Control Technology Co., Ltd.
2	Chongqing Construction Supervision & Consultation Co., Ltd.
3	Chongqing Xinke Design Co., Ltd.
4	Chongqing Xinke Communication Engineering Co., Ltd.
5	China Unicom Chongqing branch
6	ZTE Corporation (communication equipment R & D and manufacturing unit)
7	China Mobile Ltd Chongqing branch
8	Chongqing Telecom Company Limited Hechuan branch
9	Chongqing Heavy Mail Measurement Communication Technology Co., Ltd.
10	Chengdu Yicheng Technology Co., Ltd.

5.3.8.3 Software Engineering and Internet of Things Engineering

College of Mobile Telecommunications, Chongqing University of Posts and Telecommunications has established a number of relatively stable internship and training bases which meet the training objectives of information talents and meet the professional needs. Through school-enterprise cooperation, 10 new off-campus practice bases are added on the basis of the original off-campus practice base, as shown in Table 5-5.

Table 5-5 School-enterprise cooperation enterprises in Software Engineering and Internet of Things Engineering

No.	Enterprises Names	Number of students admitted each year
1	Chengdu Longitudinal Control Technology Co., Ltd.	8
2	Chongqing Construction Supervision & Consultation Co., Ltd.	6
3	Chongqing Han Hai wisdom Data Technology Co., Ltd.	30
4	Tsinghua University Press	6
5	China Unicom Chongqing Branch	5
6	Chongqing Shang Cang Technology Co., Ltd.	20
7	China Mobile Ltd. Chongqing Branch	10
8	Chongqing Telecom Company Limited Hechuan Branch	5
9	Hangzhou Hua En Education Technology Co., Ltd.	30
10	Chengdu Yicheng Technology Co., Ltd.	10

The two on-campus major internship bases also include: Diaoyucheng creative industry base (including one start-up enterprise, three micro-enterprises, one creative packaging studio, two campus advertising media studios), entrepreneurship college, university education and training park, micro-enterprise culture and creative industry incubator park, two-system excellent talent education base, and quality development base. These practice bases provide rich and colorful practice content for the students of this major, meet the needs of practical teaching, and achieve good results.

5.3.9 Library and information resource platform

1) Libraries, reference materials and media

College of Mobile Telecommunications, Chongqing University of Posts and Telecommunications and its library were established in 2000 together. The library is reference center of the university and it is the teaching assistant department serving the whole school's education, teaching and academic research. It is also an important base for school informatization and social informatization.

The library has a total area of more than 20,000 square meters and 12 floors. It has more than 1.5 million books in Chinese and foreign languages, including more than 30,000 books in foreign languages and more than 300 periodicals. The library has two storeys as a computer room for students to attend classes, find information, and engage in practical training, and so on. There are four stories for students to study for themselves. The opening hours are about 90 hours a week. There are “three departments and one room” in the library, namely the collection and editing department, the reader service department (circulation, periodicals), the teaching material department and the comprehensive office. They also have their own organization, the Library Student Management Committee.

On the second floor of the library, there is an imported log “Tree Man's Desk” with two sets of log leisure tea for rest. Introduction of lectures by famous teachers and experts on “Cultural Transfer” on the wall gives readers different feelings. In the new semester, a training room is set up for students to hold small meetings to study and discuss topics.

The four-stories library is the main place of library collection. Each story is sorted and arranged according to the book classification method from A-Z, and operates in the integrated management mode of “holding, borrowing, reading, inquiring and searching”.

There are about 3000 reading seats on the 8-11 floor of the library. Students can choose their seats freely for self-study. Each floor has an independent drinking water area and bathroom, providing convenience for students to study. Among them, there are also periodical rooms. There are more than 300 kinds of current and back issues for readers to read. Periodical rooms carry out periodical reading activities and provide interaction with readers. We have advanced digital libraries. The digital library has CNKI database of China HowNet, Weipu Chinese periodical database, Weipu network examination learning resource database and other professional digital resource databases. The total storage of digital resources in the library is more than 40 TB. Depending on the construction of our digital campus, we have set up a bibliographic database of library collections; tried out Wanfang database, Super Star Reading Show academic search, Super Star Goethe e-book borrowing machine and other databases. Our digital library construction has begun to take shape. The library closely combines the construction of college majors and disciplines, and rationally configures various disciplines and disciplines. Document resources of various majors have basically formed a multi-carrier and coordinated literature resources system with science, engineering, economics and management as the main subjects, literature, art, body and other disciplines, which can meet the needs of teaching and scientific research.

The input of library in recent five years is shown in table 5-6.

Table 5-6 Library Input in Recent Five Years

Construction Status			
purchasing funds for professional books and documents in recent 5 years	2013	463,400	
	2014	300	
	2015	0	
	2016	527,000	
	2017	694,200	
	Total		
Electronic Information Number of periodicals (species) (including electronic readings)		Number of types	Number of copies
	Chinese	1279	6842
	Foreign paper periodicals	0	0
	Electronic version of ACM、IEEE、Springer	62	62

2) Information resources platform

The College has established an educational information management platform where students can choose courses, assess the quality of teaching, and search for course evaluation results. Through this platform, teachers can post teaching calendars, have access to students' information, and manage scores. The platform is powerful and easy to use, and is also the main platform for teaching management. At the beginning of 2008, the College's "Educational Information Management" website was completed and put into use. After several years of continuous construction and operation, this website has become an important platform for students to learn independently. All current course resources are ready on this site. The information technology and network platform provided can facilitate teachers to change teaching concepts and educational concepts, prompt them to update teaching content in a timely manner, and continuously improve teaching methods, promote the relationship between teachers and students, and improve students' self-directed learning. It also facilitates the ability and interest in research and learning, and creates conditions for cultivating more and better innovative talents.

The university has established an information service platform where students can view school information, classify courses, and check results. Through the platform, teachers can view notification announcements, obtain student information, and conduct test score management. The platform is powerful and easy to use, and is the main platform for teaching management. At present, all course resources have been included in the service portal of Chongqing University of Posts and Telecommunications. Information technology and online platforms provides teachers and students with an environment for information interaction, and creates conditions for improving teaching efficiency and communication. The College has a total of 704 computers connected to the Internet for information sharing. Facilities are:

- Computer configuration: CPU Intel G1840, clocked at 2.8GHz, 2G Memory, discrete graphics, 500G hard drive, 19-inch LCD monitor, computer equipped with Windows operating system;
- Computer network speed can reach 100M;
- Labs and multimedia classrooms are equipped with multimedia equipment, projectors and multimedia teaching software;

- All offices and laboratories are covered by wireless network.

3) Supplementary facilities

- 8 computer labs in the 1st Experimental Building and the 2nd Experimental Building are: S1201, S1202, S1204, S1205, S2201, S2203, S2204, S2205, with a total number of 274 computers. 16 computer rooms are on the 6th and 7th floors of the library, with a total of 630 computers. All are networked and in normal working condition.
- The configuration of the desktop computer is: CPU: Intel Core i5 6500, Memory: 4GB, Hard-drive: 500GB;
- Laptop configuration: CPU: Intel Core i5 5300U, Memory: 4GB,Hared-drive: 500GB.

4) Computers numbers and Opening hours

- S1201, S1202, S1204, S1205, S2201, S2203, S2204, S2205 classrooms, 8 classrooms with 274 computers in total.
- Daily Opening hours: 8:00-22:00

5) Other Auxiliary Facilities

- All offices, laboratories, lecture halls and libraries in the campus are covered by the wireless network;
- Computer lab computers are updated annually according to actual needs to meet advanced needs;
- Computer Campus Network can help to easily realize the remote operation of advanced computer-aided equipment; Some laboratories, classrooms, office buildings, etc., are equipped with barrier-free facilities to enable students with disabilities to enter these teaching sites smoothly.

5.3.10 Facility for teaching and administration

The teaching buildings of the School of Intelligent Engineering include the four academies: Zhuyi, Meiruo, Songge and Heyue. There are 7 professional teachers' office areas, 1 conference room, 1 data room and 20 laboratories, the total area is 2,409 square meters, which are used to meet the needs of teaching and experiment. Please see Appendix Q1 for information on the teacher's office space.

The teaching buildings of the School of Communication and Internet of Things Engineering includes the 4th Teaching Building, the 7th Teaching Building and the Beishan Academy. There are 8 professional teachers' office area, 1 conference room, 1 data room and 31 laboratories, the total area is more than 2,500 square meters, which are used to meet the needs of teaching and experimentation. Please see Appendix Q2 for more information on the teacher's office space.

The School of Big Data and Software has a total of 5 experimental (also teaching) and administration buildings with 254 rooms with a total area of 11,409 square meters, which are used to meet the needs of teaching, research, foreign exchange and cooperation, as well as the needs of teachers' services and office space. In addition, the School also has 3 meeting rooms (Library Room Number: 209, 201, 203), and the Internet of Things Engineering has 5 meeting rooms (Rooms 201, 202 and 203 in 1st Admin Block; and Rooms.108 and 313 in 2nd Admin Block) for visiting scholars to hold the seminars and academic reports. The professional laboratory is open to students of the program and is used for independent academic research and experimental research. Please see Appendix Q3 for more information on the teacher's office space.

In addition, the College has 3 small conference rooms (Rooms 107, 404 and 601 in Admin Building) and a large academic lecture hall (the Grand Theatre of Xialiba and Bingo Grand Theatre)

for scholars and experts to hold seminars and academic reports. The professional laboratory is open to students of the program and is used for independent academic research and experimental research.

5.3.11 Investment over the past 3 years

Through increasing investment and continuous improvement, the College has built 6 professional laboratories over the 3 three years, including the Big Data Experimental Center, Embedded Hardware Training Center, Electronic Technology Laboratory, Electronic Design Automation and DSP laboratory 1, Electronic Design Automation and DSP Laboratory 2, and Mobile Communication Technology Laboratory, in which 919 sets of teaching experimental equipment (including software) were purchased and installed with a total investment of RMB 9,215,030. At present, 6 newly built laboratories have been put into use for practical teaching of experiment courses, cognitive practice, graduation practice and design, which are mainly for students majoring in Data and Software, Electric Engineering and Communication Engineering. More than 2 million RMB was invested in the course construction and student innovation projects. Each year, the company provides 1 million Prospect Reward Fund and performance awards to outstanding teachers. Our college and some technology companies also offer scholarships to students every year. Associate professors earn RMB160,000 a year and professors earn RMB up to 240,000 a year in our college.

The list of investments in equipment over the past three years is available in Appendices G1,G2,G3,G4.

In addition, on the one hand, our school actively guides the students with financial difficulties to study hard and strive for the scholarship, on the other hand, we also actively take various measures to carry out the funding work. See table 5-7 for the main incentive and subsidy measures.

Table 5-7 Reward and Subsidy System of College of Mobile Telecommunications, Chongqing University of Posts and Telecom.

Award	1st class	2nd class	3rd class	Note
Scholarship for outstanding students	RMB 3,000	RMB 2,000	RMB 1,000	The proportions of the first, second and third scholarships respectively are 1%, 2% and 6% of the students in each grade.
College Star	Overseas Exchange Study Program		RMB 2,000	4 categories of talents,: Arts Talents, Volunteer Pioneers, Sports Stars and Work Model are awarded annually, with 10 students for each category.
	RMB 5,000	RMB 3,000	RMB 2,000	Each year, we select four categories of talents: Learning benchmarks, Science and Technology Models, Entrepreneurial Pioneers, and Self-improvement Stars. Self-Improvement Star are selected, and 10 students are selected for each category.
Endeavor scholarship	RMB 5,000			20 students who meet the selection criteria will be awarded throughout the year.
National Endeavor scholarship	RMB 5,000			The proportion is 3.5%, with the quota allocated by the national finance and education authorities.

National Scholarship	RMB 8,000			The award proportion is 1.5‰, the specific quota is allocated by national finance and education authorities.
National Aid	RMB 4,000	RMB 3,000	RMB 2,000	The award proportion is 21.5%, and the specific quota is allocated by national finance and education authorities.
Temporary Living Allowance	RMB 600			Evaluation ratio: 21.62%, subsidy amount: RMB60 per student monthly, the specific quota is allocated by national finance and education authorities.
Part-time Work	RMB 1,500			Participation rate: 20%, subsidy amount: not less than RMB150 per student monthly, the specific number and amount shall be subject to the actual position.
National Student Loans	Full tuition loan			Application ratio: unlimited, the student can apply from the Financial Assistance Center for the student loan. Some districts and counties can provide with the full tuition loan, with a minimum loan of RMB8,000 a year.
Exchange Study Abroad	RMB 20,000			Every winter and summer vacation, the university grants 200 students to go to universities in Germany, the United States and other countries for language practice and short-term study purposes.

The awarding and aid system in our college are comprehensive. Students with financial difficulties are supported to complete their studies. Each year, no less than 35 percent of students in our college can receive scholarship with an amount of RMB 1,000 to 20,000.

6 Quality management: quality assessment and development

6.1 Quality assurance and further development

6.1.1 Internal assessment of teaching quality

In each semester, each department and training program conducts initial, intermediate and final teaching examinations, the inspection of undergraduate thesis process, teaching order examination, and examination of syllabus, teaching plan, lesson plans, test papers, etc., to solve problems that may arise during the teaching and management process. Taking the examination paper as an example, each semester College of Mobile Telecommunications, Chongqing University of Posts and Telecom and each college conducted a spot check on the test papers of the previous semester, and conducted evaluations from three aspects: test paper scores, test paper analysis and improvement measures to promote the standardization of test papers. Each semester, each college analyzes the scores of test scores and teacher and student teaching, and proposes suggestions and requirements for teachers to improve the quality of teaching.

Every semester, there are several school-level supervisors and department-level supervisors to evaluate the teachers, and timely point out the inadequacies and advantages of the teachers' in the course of teaching. Teachers are also required to listen to other teachers' courses every semester, and improve their own business level and teaching skills from mutual learning. The assessment is conducted in term. The problem will be solved in different ways (such as talking to a teacher or changing a teacher). Please see Appendix I for related classes.

6.1.2 External assessment of teaching quality

The Graduate Employment Quality Report is mainly written by the Employment and Entrepreneurship Guidance and Service Center, and the functional departments of the College assist in the completion. Since 2014, the employment quality annual report for graduates will be posted onto college's employment website. The report covers the basic situation of graduate employment in this year, the analysis of graduate employment data (including student satisfaction with the school or the employer's satisfaction with the school), and the main features of employment work. The quality report directly reflects the employment situation of students after graduation, and the problems reflected in the report will be resolved in different ways (such as opening a meeting with students, conducting activities related to professional skills, etc.). At the same time, the school-enterprise cooperation enterprise will feedback the work of graduates in the enterprise.

6.2 Means, methods and data

6.2.1 Number of students, graduation rate

According to the Regulations on the Management of the Student Status of College of Mobile Telecommunications, Chongqing University of Posts and Telecom, students with academic qualifications completing all the courses and practical teaching links specified in the training program within the prescribed number of years of college are qualified to meet the graduation requirements of the college. The college will issue a diploma before the student leaves. The students meet the requirements of the Implementation Rules for the Bachelor's Degree Awarding Work of College of Mobile Telecommunications, Chongqing University of Posts and Telecom may apply to the college for the issuance of a degree certificate. Those who fail to meet the graduation requirements may be allowed to complete their business and obtain a certificate of completion.

Graduates who have obtained a certificate of completion and who have not yet obtained a degree can respectively set for the Completion Examination in October, and the Degree Examination in November. Students can apply for graduation according to the application time issued in the specific notice from the Academic Affairs Office. Certificates of Graduation and Degree normally will be issued at the end of December at its earliest time. Previous graduates can also sit for the Degree Test in May of the following year. Based on the application deadline issued from the Academic Affairs Office, once students have passed the Test, they can apply for a degree certificate, and obtain it at the end of June at its earliest. (The applicant will receive the degree certificate with other graduates of that year.)

If the student has one of the following circumstances, his student status will be suspended from school.

(1) Anyone who need to suspend the class for more than 6 weeks due to the diagnosis of the hospital designated by the college;

(2) Anyone whose one-year sickness or leave has exceeded one-third of the total number of hours in the semester;

(3) Anyone who are to participate in the Chinese People's Liberation Army (including the Chinese People's Armed Police Force), to innovate and start a business, and to choose to study abroad;

(4) For special reasons, the student himself applies for temporary suspension of schooling;

(5) Other regulations that are determined by the college to be suspended from school.

The maximum length for students to take the suspension is no more than a year. If he or she is still unable to return to college after the expiration of the semester, he or she may apply for a one-year renewed period upon approval by the school, but the accumulative period shall not exceed three years. The College establishes and implements a flexible learning system based on actual conditions. Students innovating and starting their own business are allowed to extend their study period within an appropriate length and to simplify the application process of suspension. Students serving in the Chinese People's Liberation Army (including the Chinese People's Armed Police Force) will be retained his student status for 2 years until he completed the military service. Students participating in a cross-school joint training program organized by the College will be also retained with the student status. During the retention period, students should establish management relationships with their actual work units, schools, and other organizations. Upon expiration of the student's suspension period, students should apply for a re-study within one week from new term.

If the student has one of the following circumstances, the student may have to withdraw from the College:

(1) If their academic achievement does not meet the requirements of the College or doesn’t finish within the required semesters.

(2) After the expiration of the school year and the retention of the student's school year, the application for resumption of school has not been filed within two weeks of the start of the College or the applicant has failed to pass the College’s review;

(3) According to the diagnosis of the designated hospital, students with the illness or accidental disability who cannot continue to study;

(4) Those who fails to participate in the teaching activities prescribed by the College for two consecutive weeks without approval;

(5) Those who have not registered during the period specified by the College and have not

applied for the suspension of registration procedures, or have performed the suspension of registration procedures but have not obtained approval;

(6) Other circumstances of not being able to complete or continue studies should suggest a drop-out.

If the student applies for withdrawal, he/she will go through the formalities of withdrawal after the school has approved it. Students who withdraw from school may not return to school.

6.2.1.1 Electrical Engineering and Automation

Table 6-1 shows the number of students and graduation rates of Electrical Engineering and Automation from 2012 to 2017. Table 6-2 shows the student numbers and changes in Electrical Engineering and Automation from 2012 to 2017. In China, the dates of beginning and the end of each semester are fixed, and students end their studies at the specified times.

Table 6-1 Statistics of Graduates of Electrical Engineering and Automation

Years	2013	2014	2015	2016	2017
Student Number	142	250	251	276	248
Graduation Rate	99.07%	100.00%	100.00%	99.64%	99.60%
Bachelor's Degree	86.14%	93.20%	92.03%	99.73%	88.24%
Immediate Employment	95.05%	98.06%	98.48%	97.22%	95.56%
Further Study	5.63%	1.60%	1.99%	0.69%	2.29%
No-Degree	13.86%	6.80%	7.97%	0.27%	11.76%

Table 6-2 Statistics on the Number of Students in Electrical Engineering and Automation

Years	Student Number	Suspension	Withdraw
2012	934	0.23%	0.18%
2013	1061	0.33%	0.22%
2014	927	0.75%	0.41%
2015	882	0.44%	0.39%
2016	815	0.49%	0.34%
2017	763	0.65%	0.28%

Each year, the college collects and analyzes graduates' data to assess the overall implementation of the curriculum and the quality of teaching.

6.2.1.2 Communication Engineering

Table 6-3 shows the number of students and graduation rates of Communication Engineering from 2012 to 2017. Table 6-4 is the statistics of the number of students and number changes of Communication Engineering from 2012 to 2017. In China, the beginning and end of each semester is fixed, and students end their studies at a specific time.

Table 6-3 Destinations of Graduates of Communication Engineering

Time	Total Number of Students	Number of employment	Immediate Employment	Destinations of graduates			
				Number of Graduates Employed	Proportion of Graduates Employed	Number of Graduates Serving the Army	Number of Graduates Studying Abroad
2012	419	412	98.56%	384	91.87%	0	1

2013	569	494	86.82%	453	76.45%	0	2
2014	799	742	92.87%	711	88.99%	9	1
2015	868	809	93.20%	772	88.94%	11	1
2016	846	738	87.54%	712	84.46%	17	4
2017	873	785	90.02%	759	87.04%	19	2

Table 6-4 Learning Changes of Students of Communication Engineering

Years	Number of students	Suspension rate	Withdrawal rate
2012	419	1.2%（5）	0.7%（3）
2013	569	2.8%（16）	1.05%（6）
2014	799	2.1%（17）	1.4%（11）
2015	868	0.9%（8）	0.34%（3）
2016	846	0.6%（5）	0.47%（4）
2017	873	2.1%（18）	0.34%（3）

6.2.1.3 Software Engineering

Table 6-5 shows the number of students and graduation rates of Software Engineering from 2012 to 2017. In China, the beginning and end of each semester is fixed, and students end their studies at a specific time.

Table 6-5 Destinations of graduates of Software Engineering

Time	Total Number of Students	Number of employment	Immediate Employment	Destinations of graduates			
				Number of Graduates Employed	Proportion of Graduates Employed	Number of Graduates Serving the Army	Number of Graduates Studying Abroad
2014	105	100%	93.13%	0	0	0	6.87%
2015	141	99.27%	98.54%	2.18%	2.18%	0	1.46%
2016	116	99.11%	96.46%	1.76%	1.76%	0	3.54%
2017	104	97.02%	96.03%	0.99%	0.99%	0.96%	3.97%

The school collects and analyses graduates' data annually to assess the overall teaching implementation and quality of the curriculum.

6.2.1.4 Internet of Things Engineering

Table 6-6 shows the number of students and graduation rates of IoT Engineering in 2017. In China, the beginning and end of each semester is fixed, and students end their studies at a specific time.

Table 6-6 Destinations of Graduates of IOT Engineering

Time	Total Number of Students	Number of employment	Immediate Employment	Destinations of graduates			
				Number of Graduates Employed	Proportion of Graduates Employed	Number of Graduates Serving the Army	Number of Graduates Studying Abroad
2017	61	54	96.72%	50	93%	1	0

The school collects and analyses the data of graduates each year to assess the overall implementation and quality of curriculum teaching.

6.2.2 Assessment of examination results and statistical continuation

Each semester the teacher will submit a score report; the faculty will analyze the students' scores and find ways to improve them. Students who fail in a course will be given a chance to take a supplementary examination. If they fail the exam, students will be arranged to resume the course together with the lower grade students until they pass the exam. For students failing the exam, counselors, academic mentors and class mentors will monitor and encourage their learning and performance through conversation, counseling and discussion. The College also maintains close contact with the parents of the students, and report to them immediately on their children's performance.

6.2.3 Students' evaluation for teaching quality

Students' evaluation of teaching quality is an important part of teaching evaluation system. Each student must submit a teaching quality assessment form before choosing a course for each semester, otherwise they will not be able to find their test results. To analyze the teaching suggestions listed in the evaluation form can improve teaching methods. Student assessment will also be used to assess teachers' teaching quality and be linked to teachers' performance. For more information, please refer to Appendix M.

According to the course, the evaluation results for each teacher are calculated. The evaluation results are divided into four grades: excellent, good, qualified and unqualified. The final score of each teacher's Students' Evaluation Form is obtained from the arithmetic average of the students participating in the effective investigation. The result of teaching evaluation is composed of scores and grades. The relationship between grade and score are shown as excellent (score $\geq$ 85), good (75 $\leq$ score $<$ 85), qualified (60 $\leq$ score $<$ 75) and unqualified (score $<$ 60). Invalid data and other abnormal data, such as courses with a rate of less than 60%, are not included in the calculation of the evaluation results.

Feedback on the results of the "Students' Evaluation for Teachers" takes place at the end of term. The Department of academic Affairs will give the feedback on the summary result of Students' Evaluation to the department of the teacher, and each department will feedback the result to the teacher himself. All the teachers under assessment should fully understand and attach great importance to the work of "students' evaluation", track and analyze the relevant indexes and data of "students' evaluation", and adjust and optimize teaching styles, teaching methods and teaching contents in a timely manner.

A case in which the result of "students' evaluation" is "unqualified" or "qualified" but ranked in the bottom 3% of schools is regarded as abnormal. The Department of Academic Affairs promptly provide the feedback of the list of teachers to each faculty. Faculties need to strengthen the follow-up of the teaching situation of these teachers, organize peer experts to conduct diagnostic lectures, and help them to analyze and find out the solutions to improve classroom teaching in time. For those with serious problems, their teaching tasks should be adjusted or suspended in time to ensure the quality of teaching.

The results of the Students' Evaluation for Teachers will be used as the reference for the appointment and assessment of teaching positions, the evaluation of professional and technical positions, the excellence selection activity , the calculation of teaching workload allowance etc.

7 Documentation and transparency

7.1 Relevant regulations

7.1.1 Teaching evaluation system

Office of Teaching Affairs carries out internal teaching evaluation on a regular basis, and carries out questionnaire survey among students for every course, so as to understand teachers' basic performance on each aspect in the teaching process. The questionnaires will be collected and sorted out by the exam committee, submitted to the dean of each faculty, and notified to relevant course teachers. For relevant assessment questionnaires, please refer to Appendix I, Teachers' Evaluation Table is provided in Appendix M.

7.1.2 Student admission evaluation

Every student needs to obtain 240 ECTS credits before they are qualified for the final assessment of the course. After the assessment, their scores are recorded in the score sheet and recorded in students' records system whether they are passed or not. Those who have passed national CET-4 exam will be deemed qualified in English course. The student who has not obtained 22 ECTS credits every term or cumulatively failed to reach 30 ECTS credits should be retained or downgraded. He should study with next grade. Those who fail to obtain 240 ECTS credits will not be conferred a degree.

For the enrollment information of four majors over the past five years, please refer to Appendices R1, R2, R3 and R4 Admission Information.

7.1.3 Further development and continuous improvement

The school very concerned about the continuous development of the programs. We have made constant exploration and put forward relevant supporting management systems. The College has established dedicated graduate follow-up information system and network management system to collect and analyze employed graduates feedback. In addition, the College will hold annual alumni party at the College's anniversary every year, to build a platform for continuous exchange and communication with graduates, so as to promote the continuous improvement of teaching plans and the rising of teaching level and quality.

7.2 Diploma supplement and qualification certificate

AppendicesJ1,J2,J3,J4 provide the samples of the graduation certificate and bachelor degree certificate of the students graduated from Electrical Engineering and Automation ， Communication Engineering ， Software Engineering and IoT Engineering Program of College of Mobile Telecommunications, Chongqing University of Posts and Telecom. All diplomas are effective only after affixed with the official seal of the University and the signature of the president.

Appendix K is diploma supplement; Appendix L is student transcript samples.

Appendix List

Appendix A1 Staff Handbook of Public Course
Appendix A2 Staff Handbook of Electrical Engineering and Automation
Appendix A3 Staff Handbook of Communication Engineering
Appendix A4 Staff Handbook of Software Engineering
Appendix A5 Staff Handbook of Internet of Things Engineering