Self-Assessment Report for an International ASIIN Programme Accreditation

for the Bachelor's Degree of Transportation

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ASIIN Programme Self-Assessment Report

Section A of the SAR includes tables in which basic data concerning the accreditation procedure.

Section B contains basic data concerning the submitted study programmes.

Section C contains the Self-Assessment section organised according to the ASIIN Criteria.

A About the Accreditation Procedure

General Data

Name of the Higher Education Institution	Shenzhen Technology University
Faculty/Department offering the Degree Programme	College of Urban Transportation and Logistics
Website of the Higher Education Institution	https://www.sztu.edu.cn/
Website of the Faculty/Department	https://utl.sztu.edu.cn/

Seals applied for

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)
交通运输	Transportation	EUR-ACE® Label		TC 03

B Characteristics of the Degree Programme(s)

Name (English translation)	Final degree (original/English translation)	Areas of Specialisation (if compulsory)	Corresponding level of the EQF	Mode of Study	Double/Joint Degree	Duration	Credit points/unit	First time of offer
Transportation	工学学士/ Bachelor of Engineering, for Transportation		6	Full time	No	8 semesters	192 ECTS	September 2019

Name	Intake rhythm	Intake Capacity per cohort	Average starting cohort size	Average number of graduates per cohort	Average time required to complete studies
Transportation	Annually	Max. 86 students	71 students (2019-2024)	69 students (2023-2024)	4.14 years

C Self-assessment for the ASIIN-Seal

1. The Degree Programme: Concept, Content & Implementation

1.1 Objectives and learning outcomes of a degree programme

1.1.1 Training objectives

The Transportation programme at Shenzhen Technology University is designed to cultivate high-level professionals for modern urban integrated transportation systems. Graduates will master fundamental theories, methodologies, and enabling technologies in transportation engineering and related interdisciplinary fields.

They are expected to possess a strong sense of social responsibility, humanistic qualities, professional ethics, international perspective, and innovative spirit. The programme emphasizes engineering practice and aims to develop graduates who can comprehensively apply their knowledge and skills — while considering economic, environmental, legal, and safety constraints—to solve practical engineering problems.

Upon completion of the four-year programme, graduates should:

- Have a solid foundation in humanities, social sciences, mathematics, and natural sciences.
- Systematically master core and interdisciplinary knowledge in transportation.
- Be able to integrate and flexibly apply theory and expertise in engineering practice.
- Demonstrate strong competence in mathematics, economic management, computer science, and foreign languages.
- Be capable of conducting research, development, design, and implementation of transportation engineering solutions, with a focus on system optimization.
- Be proficient in literature review, data analysis, and the use of modern information technology.
- Exhibit teamwork, organizational management, and cross-cultural communication skills.
- Demonstrate adaptability, innovative thinking, and a commitment to lifelong learning.

Graduates will be well-prepared for careers in engineering design, technology development, maintenance and control, organizational management, and innovation within the fields of transportation—such as intelligent transportation systems, planning, and management.

The detailed training objectives for the Transportation programme are published on the homepage of the College of Urban Transportation and Logistics (see Section 1 in Appendix 05-1).

1.1.2 Learning outcomes of the programme

1.1.2.1 Definition of programme learning outcomes

The programme learning outcomes (PLOs) are formulated through a systematic process integrating national and international standards, evolving labour market requirements, and the strategic goals of the university and CUTL. Specifically, the development of PLOs is guided by:

- National educational standards and professional accreditation requirements (e.g., China Engineering Education Accreditation, ASIIN General and Subject-Specific Criteria/SSC03).
- In-depth analysis of current and emerging industry needs, based on regular consultation with major local employers (such as Shenzhen Metro, Shenzhen Urban Transport Planning Center, BYD, etc.), industry trend studies, and review of job postings.
- Benchmarking against leading national and international transportation/traffic engineering programmes.
- Consultation with all relevant stakeholders, including:
    - Faculty and teaching staff (through regular teaching seminars and departmental meetings)
    - Employers and industry partners (via site visits, advisory board meetings, and industry forums)
    - Students (through regular student-teacher meetings and surveys)
    - Professional associations (through participation in programme argumentation meetings and industry-academia cooperation)

1.1.2.2 Intended learning outcomes (Knowledge, Skills, and Competences)

Upon graduation, students of the Transportation programme are expected to possess the following knowledge, skills, and abilities, in alignment with outcome-based education (OBE) principles and international engineering education standards:

1) Engineering knowledge

Systematically master fundamental theoretical knowledge of transportation engineering and related interdisciplinary fields; apply mathematics, natural sciences, and engineering sciences to understand and solve complex engineering problems in transportation.

2) Problem analysis

Identify, analyze, and articulate complex transportation problems using appropriate scientific principles and methods; conduct literature review, problem decomposition, reasoning, and modeling to develop effective solutions.

3) Design and development of solutions

Integrate knowledge and skills to design innovative engineering solutions for complex transportation problems, considering social, health, safety, legal, cultural, economic, and environmental factors; validate and optimize design proposals through simulation or experimentation.

4) Research ability

Conduct in-depth research on transportation engineering issues, including experiment design, data collection and analysis, and information integration, to obtain reliable and effective conclusions and explore new methods, technologies, and theories.

5) Modern tool usage

Develop, select, and proficiently use appropriate engineering technologies, modern engineering tools, and information technology (such as software for data analysis, modeling, and simulation) to address transportation engineering problems, understanding their principles, scope, and limitations.

6) Engineering and sustainable development

Understand the impact of transportation engineering practices on environment and social sustainable development; apply knowledge to evaluate project sustainability and propose measures for environmental protection, energy saving, and resource efficiency.

7) Engineering ethics and professional norms

Demonstrate strong humanities and social responsibility, adhere to engineering ethics and industry standards, uphold correct values, prioritize public interest, and maintain honesty, fairness, and self-discipline in professional practice.

8) Individual and teamwork

Exhibit teamwork spirit and communication skills; clearly express ideas, respect and collaborate effectively with team members in multidisciplinary environments, and demonstrate leadership and responsibility.

9) Communication and international perspective

Communicate effectively on complex engineering issues with peers and the public; write high-quality reports and design documents; demonstrate strong oral and written skills, proficiency in at least one foreign language, and cross-cultural communication abilities, enabling participation in international exchange and cooperation.

10) Project management

Understand and apply principles of project management and economic decision-making in transportation engineering, including planning, organization, coordination, control, and cost/quality/time management; effectively manage and implement engineering projects.

11) Lifelong learning

Recognize the importance of self-directed and lifelong learning; continuously update knowledge and skills, adapt to rapid developments in the field, and pursue sustainable personal and professional growth.

1.1.2.3 Assessment and demand

(1) Professional assessment

The programme passed the assessment for the granting of bachelor degrees in 2022, obtaining the qualification for awarding bachelor's degrees (see Appendix 13-1).

(2) Job market

Graduates of this programme are widely accepted in the job market, possessing strong practical abilities, solid professional knowledge, adaptability, and innovative awareness, along with high overall capabilities. The training of transportation professionals targets various fields within the transportation industry, offering broad employment opportunities. Main employment destinations include transportation planning and design consulting firms, transportation management agencies, and transportation equipment suppliers. The employment rate of the two graduating classes has exceeded 85% (including domestic and international further studies).

(3) Graduate survey

Survey results indicate that the program's curriculum is well-structured and closely aligned with job market demands, with graduates demonstrating strong adaptability after entering the workforce (see Appendix 22-4).

1.1.3 Learning outcomes of course modules

1.1.3.1 Modules of the curriculum

The curriculum is structured into nine major module groups, each designed to support the attainment of the programme's intended learning outcomes (graduate attributes). Each module group specifies its own module learning outcomes, which are further supported by the specific courses within the module. The module learning outcomes are as follows:

1) Mathematics and Physics Module

Learning Outcomes:

Upon completion of this module, students will be able to:

- Apply mathematical principles and physical laws to model, analyze, and solve engineering problems in transportation.
- Use quantitative reasoning to interpret and address technical challenges.
- Lay a solid foundation for further study in advanced engineering courses.

Representative Courses: Advanced Mathematics A (I & II), Linear Algebra A, Probability and Statistics A, Operations Research, College Physics B (I & II), College Physics Experiments B (I & II).

2) Informatics Module

Learning Outcomes:

Upon completion of this module, students will be able to:

- Apply programming, databases, and information technologies to analyze and solve transportation engineering problems.
- Develop proficiency in software tools for data analysis, modeling, and simulation.

Representative Courses: College Computer A, Python Programming B, Information Systems and Databases.

3) Engineering Fundamentals Module

Learning Outcomes:

Upon completion of this module, students will be able to:

- Master essential engineering concepts in mechanics, electronics, and engineering drawing (CAD).
- Apply foundational engineering knowledge to the analysis and initial design of transportation systems.
- ***Representative Courses***: Engineering Drawing and CAD, Engineering Mechanics, Fundamentals of Transportation Electrotechnics Technology.

4) Engineering Applications Module

Learning Outcomes:

Upon completion of this module, students will be able to:

- Integrate professional knowledge in transportation systems, economics, and organization to solve complex engineering problems.
- Design and optimize components of transportation systems, considering real-world constraints.
- Demonstrate awareness of innovation and sustainability in engineering practice.

Representative Courses: Introduction to Rail Transit, Transportation Organization, Transport Economics, Traffic Engineering, Principles of Urban Planning, Artificial Intelligence Technology and Application.

5) Electives Module

Learning Outcomes:

Upon completion of this module, students will be able to:

- Pursue in-depth and interdisciplinary topics according to their interests and career goals.
- Apply advanced or emerging knowledge to specific challenges in intelligent transportation, planning, management, or rail transit.

Representative Courses: Geographic Information System and Application, Green Manufacturing and Environment, Project Management, Traffic System Analysis, Data Analysis and Data Mining, Control Engineering Basis, Traffic Safety Engineering, Traffic Planning, etc.

6) Foreign Languages Module

Learning Outcomes:

Upon completion of this module, students will be able to:

- Communicate effectively in English (or German) in academic and professional settings.
- Read, understand, and produce technical documents in a foreign language for international collaboration.

Representative Courses: College English A (I & II), German for Beginners I, Technical English and Thesis Writing.

7) General Education Module

Learning Outcomes:

Upon completion of this module, students will be able to:

- Demonstrate fundamental knowledge in humanities and social sciences, including Chinese history, law, and ethics.
- Develop social responsibility, ethical awareness, and a sense of citizenship.
- Communicate effectively, and understand the societal and global context of engineering practice.
- Foster teamwork, leadership, mental and physical well-being, and adaptability.

Representative Courses: Chinese Modern and Contemporary History, Situation and Policy Education, Ideology Morality and Rule of Law, Basic Principles of Marxism, Introduction to Xi Jinping Thought, Laboratory Safety Training, Military Theory, Military Training, Sports Club, National Security Education, Mental Health for College Students.

8) Practical Training Module

Learning Outcomes:

Upon completion of this module, students will be able to:

- Apply theoretical knowledge in real-world or simulated engineering settings through internships, practice projects, and industry exposure.
- Demonstrate problem-solving, project management, teamwork, and communication skills in a professional context.
- Adapt to workplace norms and requirements.

Representative Courses: Industry Cognition, Engineering Survey Practice and Labor, Innovative Practice Project (Level 1), Internship in Enterprise.

9) Bachelor's Thesis Module

Learning Outcomes:

Upon completion of this module, students will be able to:

- Independently complete research, design, or development tasks based on transportation engineering topics.
- Apply integrated knowledge and skills to solve complex engineering problems through a substantial project.
- Effectively communicate and defend research findings in both written and oral forms.

Representative Courses: Graduation Thesis (Design).

The above module learning outcomes are fully aligned with the programme's intended learning outcomes (see Section 1.1.2) and support the achievement of all graduate attributes through a well-structured curriculum. Each specific course further defines its own learning outcomes in the module handbook, ensuring transparency and traceability throughout the teaching and learning process.

The relationship between each curriculum module and the programme's intended learning outcomes is systematically mapped in the module–outcome matrix (see Appendix Table 3 in Appendix 05-1). This matrix clearly demonstrates how each module

supports the achievement of specific graduate attributes and ensures that all learning outcomes are comprehensively covered through the curriculum structure.

1.1.3.2 Objective matrix

Table 1-1 Transportation programme objective matrix.

Training Objectives	Expected Learning Outcomes of the Entire Course	Corresponding Modules/Module Objectives
1. Master foundational knowledge of mathematics, natural sciences, and information technology as a basis for advanced study and engineering problem solving.	Knowledge: Solid foundation in mathematics, physics, and information technology relevant to engineering. Skills: Apply mathematical and computational methods to model, analyze, and solve engineering problems. Competences: Integrate quantitative reasoning and information thinking to interpret and address technical challenges in transportation engineering.	Mathematics and Physics: Advanced Mathematics A (Part 1 & 2), College Physics B (Part 1 & 2), College Physics Experiments B (Part 1 & 2), Linear Algebra A, Probability and Statistics A, Operations Research. Informatics: College Computer A, Python Programming, Basic Programming B, Information Systems and Databases.
2. Master the basic engineering and professional knowledge in the field of transportation engineering to lay a solid foundation for future professional course studies.	Knowledge: Master the basic engineering and professional knowledge in the field of transportation engineering. Skills: Possess relevant basic engineering and professional knowledge and skills to analyze various engineering phenomena in transportation engineering and master the knowledge, methods, and skills to solve practical problems in engineering applications. Competences: Master the relevant concepts and basic principles in the field of transportation engineering, and understand engineering problems through continuous analysis, induction, judgment, and reasoning based on the characteristics of transportation engineering.	Engineering Fundamentals: Engineering Drawing and CAD, Engineering Mechanics, Fundamentals of Transportation Electro-technics Technology. Professional Practice: Industry Cognition, Engineering Survey Practice and Labor.
3. Master the professional knowledge related to solving complex engineering problems in the transportation field, including the composition	Knowledge: Master professional knowledge in the transportation field, including urban road traffic, rail transit systems, and key technologies in transportation system planning	Engineering Applications: Introduction to Rail Transit, Transportation Organization Theory, Transport Economics, Traffic Engineering, Principles of Urban Planning, Artificial

and key technologies of urban road traffic and rail transit systems, as well as the key technologies in transportation system planning and operation organization.	and operation organization. Skills: Proficient in analyzing and solving practical problems in transportation engineering and providing reliable solutions to meet the specific needs of complex transportation engineering problems. Competences: Master the integrated capabilities required for the planning, design, management, and operation of multimodal transportation systems, applying engineering background knowledge to analyze and evaluate practical problems reasonably while reflecting innovative awareness in the design process.	Intelligence Technology and Application. Professional Practice: Innovative Practice Project (Level 1), Engineering Survey Practice and Labor. Graduation Thesis (Design)
4. Master cutting-edge professional knowledge and skills in the transportation field, tracking the development trends of related fields, and completing further self-development.	Knowledge: Master professional knowledge in the new fields and cutting-edge areas of transportation engineering. Skills: Expand professional knowledge, track the development trends in professional and related fields, and engage in related knowledge accumulation and in-depth learning. Competences: Obtain comprehensive quality in interdisciplinary fields related to the course and apply the acquired professional knowledge broadly.	Electives: Geographic Information System and Application, Green Manufacturing and Environment, Project Management, Traffic System Analysis, Data Analysis and Data Mining, Control Engineering Basis, Traffic Safety Engineering, Planning and Design of Transportation Terminals, Modern C++ programming, Measurement and Application of Key Standards, Introduction to Intelligent Transportation System, Operation Organization and Management of Rail Transit, Road traffic design, Fundamentals and technology of sensors, Infrastructure and equipment of rail transit, Rail transit train operation organization, Modeling and simulation of transportation system, Traffic planning, Traffic information detection and processing, Traffic management control, Railway vehicle and operation control. Professional Practice: Innovative Practice Project (Level 1), Internship in Enterprise.

		Graduation Thesis (Design)
5. Possess the foreign language proficiency required for international communication and study abroad, as well as the ability to adapt to international cross-cultural cooperation and communication skills.	Knowledge: Master one foreign language, including basic knowledge of professional English or German. Skills: Ability to read professional literature in a foreign language and communicate with international peers in the field, discussing professional issues. Competences: Possess comprehensive reading and expression skills in a foreign language, engage in global-related work, and conduct cross-cultural communication.	Foreign Languages: College English A (Part 1 & 2), German for Beginners I, Technical English and Thesis Writing. International Courses
6. Understand the current social model and social norms in China, possessing good social behavior, teamwork spirit, and humanistic care.	Knowledge: Master knowledge of modern Chinese history, basic principles of Marxism, patriotism, humanistic spirit, physical education, and military training. Skills: Understand social phenomena, focus on and adapt to social development, possess the ability to communicate and collaborate with others, and foster a team spirit that promotes personal physical and mental health and self-improvement. Competences: Form a well-rounded personality and good psychological quality, possessing correct views on life, values, morals, and laws, as well as humanistic quality and social responsibility.	General Education: Chinese Modern and Contemporary History, Situation and Policy Education 1~3, Ideology morality and rule under the law, Basic principles of Marxism, Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, Introduction to Maoism and Socialist Theoretical System with Chinese Characteristics, Laboratory Safety Training, Military Theory, Military Training, Sports Club I~IV, National Security Education for College Students, Mental Health for College Students.

1.1.4 Alignment with ASIIN Subject-Specific Criteria (SSC 03)

According to ASIIN General Criterion 1.1, the programme must systematically correlate its intended competence profile and curriculum with the exemplary learning outcomes specified in the most relevant Subject-Specific Criteria (SSC). The analysis below demonstrates the alignment of the SZTU Transportation (Traffic Engineering) programme with the SSC 03 requirements for civil engineering, with a particular focus on the field of traffic engineering.

The competence profile and curriculum of this programme fully cover all core areas required for traffic engineering as outlined in SSC 03, including transport planning, traffic systems analysis, public transport, road and rail infrastructure, traffic management and

control, traffic flow modelling, relevant legal, economic, and environmental aspects, teamwork, communication, project management, and lifelong learning.

Given the sector-specific orientation of this programme, general civil engineering core topics such as structural engineering, geotechnics, water engineering, and construction materials are not fully included in the curriculum. This is a deliberate and internationally accepted approach for specialised traffic engineering programmes, as such topics are not essential for the competence profile or career pathways of traffic engineering graduates. Any differences from the broader civil engineering profile are therefore justified by the professional focus of the programme and are compensated by a strong emphasis on advanced traffic engineering modules, practical training, and industry-relevant skills.

Table 1-2 provides a systematic mapping between the SSC 03 core requirements for traffic engineering and the corresponding programme learning outcomes and modules. Where deviations exist, they are explained and justified in the remarks.

Table 1-2 Mapping between SSC 03 and Programme Outcomes

SSC 03 Core Requirements for Traffic Engineering	Corresponding LO/Module at STZU Transportation Programme	Remarks/Compensation
Mathematics, Physics, Informatics	LO1, LO2; Mathematics & Physics, Informatics	Fully covered
Traffic Planning, Survey, System Analysis	LO1, LO2, LO3; Engineering Applications, Core Courses	Fully covered
Public Transport, Road & Rail Infrastructure	LO1, LO3; Engineering Applications, Rail Transit Courses	Fully covered (sector-specific focus)
Traffic Control & Management	LO3, LO5; Engineering Applications, ITS-related Electives	Fully covered
Traffic Flow Analysis, Modelling, Data Analysis	LO5; Informatics, Electives (Data Analysis, Simulation)	Fully covered
Law, Economics, Environment, Social Impacts	LO6, LO7, LO10; Applications, Electives	Fully covered
Teamwork, Communication, Project Management	LO8, LO9, LO10; Practice, Thesis, Foreign Language	Fully covered
Lifelong Learning, Ethics, Social Responsibility	LO6, LO7, LO11; General Education, Humanities	Fully covered
Structural Engineering, Geotechnics, Water Engineering, Construction Materials	Not included	Not essential for traffic engineering graduates; compensated by advanced and applied traffic engineering modules. This approach is consistent with international practice for specialised traffic

		engineering programmes.

*Note: The programme's sector-specific focus ensures comprehensive coverage of all SSC 03 requirements relevant to traffic engineering. Topics outside the core scope of traffic engineering are not included, as justified above. All competencies essential for professional practice and further study in the field are thereby assured.

1.1.5 Regular review of programme learning outcomes

The University/Department has established a robust mechanism for the regular review and continuous improvement of programme learning outcomes, involving all major stakeholders. The key elements include:

1) Regular student-teacher forums and faculty teaching seminars

Each semester, the University organizes meetings between students and faculty, as well as faculty-only teaching seminars, to review the implementation of each course and identify areas for improvement. The feedback and findings serve as a basis for curriculum and programme adjustment.

2) Annual programme revision and periodic programme argumentation meetings

The programme is reviewed and revised annually in response to industry trends, teaching feedback, and student/alumni input. Every 2-3 years, a formal programme argumentation meeting is held, inviting industry experts (from major employers), senior professors from other universities, and professional associations to provide external perspectives and validation.

3) Regular stakeholder surveys

Surveys and questionnaires are regularly distributed to current students and alumni to collect suggestions regarding curriculum optimization and course provision. These results directly inform revisions to the programme.

4) Teaching evaluation and supervision system

The University implements a dynamic teaching evaluation and supervision system, including peer reviews, classroom observations, and student evaluations. Courses are regularly assessed and adjusted, and targeted recommendations are made for continuous improvement.

5) Employer outreach and demand-driven curriculum optimization

Faculty teams regularly visit major local employers in the transportation sector (e.g., Shenzhen Metro, SZUTPC, BYD, etc.) to gain first-hand insights into evolving talent needs. These findings are used to refine programme specialization tracks, update core and elective courses, and adjust compulsory/optional course offerings to better align with employer expectations.

Recent reforms—for example, the inclusion of smart transportation, artificial intelligence, and data analytics modules—have been directly motivated by employer feedback and industry developments.

1.2 Name of the degree programme

The Transportation Programme at Shenzhen Technology University originated from the Transportation Programme established at Shenzhen University in 2010. With the founding of Shenzhen Technology University in 2018, the programme was officially transferred and approved by the Ministry of Education, and began independent enrollment in 2019. Over 14 years of undergraduate education, the programme has accumulated extensive experience in talent cultivation.

Recognized as a distinctive discipline in Guangdong Province and a key project under Guangdong's First-Class Undergraduate Programmes, the programme features an emphasis on the integration of new technologies and smart applications. It is built as an interdisciplinary and comprehensive field, with transportation engineering as its core and supported by related disciplines.

The programme maintains close alignment with China's rapidly developing transportation industry, and has established industry-university-research cooperation bases with leading enterprises such as Shenzhen Metro and BYD (see Appendix 03: Cooperation Agreement). Key research areas include rail transit, intelligent transportation, and integrated transportation systems. The programme is committed to cultivating outstanding professionals with an international outlook to meet both regional and global socio-economic development needs.

1.3 Curriculum

1.3.1 Content

The undergraduate programme in Transportation is structured as a four-year, eight-semester curriculum, designed to systematically develop students' knowledge, skills, and competencies in a progressive manner.

General Education and Language Courses: From the first to fifth semesters, students take language courses (English and German), Philosophy, Humanities, Ideological and Political Education, and Physical Education. This arrangement enhances students' intercultural communication, legal awareness, and humanistic qualities, laying a solid foundation for their personal and professional development (see Appendix 08).

Mathematics, Physics, and Informatics: Mathematics and physics courses are integrated from the first to the fourth semesters. Advanced Mathematics is offered in the first and second semesters, while Linear Algebra, Probability and Statistics, and Operations Research are taught in the third and fourth semesters. College Physics is scheduled in semesters one and two. Informatics courses are spread from the first to the fourth semesters, ensuring students build strong capabilities in computer science and information technology.

Engineering Foundation Courses: From the first to the fourth semesters, students undertake core engineering courses, including Engineering Drawing and CAD, Engineering

Mechanics, and Fundamentals of Transportation Electrotechnics Technology. These courses provide the essential engineering knowledge and skills required for advanced studies in transportation engineering.

Engineering Application Courses: Professional and application-oriented courses are arranged from the third and fourth semesters onwards. These courses deepen students' understanding of transportation systems, covering areas such as transportation planning, organization, and intelligent transportation technologies. They are crucial for developing practical abilities to solve complex engineering problems.

Elective Courses: Elective courses are available mainly from the fourth to sixth semesters. These help students broaden their knowledge, develop interdisciplinary skills, and pursue areas of personal or career interest. Students are required to complete a minimum of 25 elective credits.

Professional Practice and Bachelor's Thesis: Hands-on practice and research are emphasized throughout the programme, with professional practice courses and the bachelor's thesis scheduled mainly from the third to the eighth semesters. Many thesis topics and practice projects are sourced from faculty research or real-world engineering problems provided by industry partners, allowing students to gain substantial practical experience and strengthen their employability.

Upon successful completion of all required courses and modules over eight semesters, students will have earned a total of 192 credits.

1.3.2 Structure of the programme

The curriculum covers nine competency areas, each with specific learning outcomes and basic requirements:

1) Mathematics and Physics

Expected Learning Outcomes: Master the foundational knowledge and principles of mathematics and natural sciences, deepen the understanding of natural sciences, and enhance scientific literacy for problem-solving, laying the groundwork for subsequent engineering foundational courses.

Basic Requirements: Ability to apply the basic theoretical knowledge of natural sciences to analyze scientific problems in engineering practice.

2) Information Technology Courses

Expected Learning Outcomes: Master the basic knowledge of information technology and computer science, and apply computer and information technology tools to effectively solve practical problems in scientific and technical fields, laying the foundation for future studies.

Basic Requirements: Ability to use computer and information technology methods to solve practical problems related to the studied profession.

3) Engineering Foundation Courses

Expected Learning Outcomes: Master a wide range of foundational engineering knowledge, providing a solid basis for subsequent engineering application courses.

Basic Requirements: Master the theoretical knowledge, experimental methods, and testing skills of engineering mechanics; understand and apply the foundational knowledge and principles of electrical engineering technology for design and analysis; master the basic knowledge and relevant theories of transportation engineering, including skills in engineering drawing, modeling and analysis, laboratory experiments, and data processing.

4) Engineering Application Courses

Expected Learning Outcomes: Master professional knowledge and skills in the field of transportation and related areas to analyze and solve complex engineering problems.

Basic Requirements: Familiarity with measurement and processing methods of transportation engineering-related data; mastery of theories and principles of transportation planning; knowledge and skills in transportation organization and economics, possessing technical abilities relevant to the work.

5) Elective Courses

Expected Learning Outcomes: Understand cutting-edge professional knowledge and interdisciplinary knowledge in transportation and related fields, keeping up with the development trends in these areas.

Basic Requirements: Master the professional knowledge involved in interdisciplinary and emerging fields of transportation, possessing professional skills for related work. Students may choose courses that suit their personal interests and development needs, with a requirement to complete 25 credits.

6) Foreign Language Courses

Expected Learning Outcomes: Acquire cross-cultural communication abilities necessary for international cooperation, better adapting to societal development and globalization.

Basic Requirements: Master the English language and study German; be able to read professional literature and engage in professional foreign language communication.

7) General Courses

Expected Learning Outcomes: Cultivate students' humanistic qualities, social skills, and team spirit. Engage in physical exercise to maintain health. Master foundational knowledge of humanities and social sciences, possessing good humanistic qualities and responsible for professional, social, and environmental duties; participate in practical activities and group activities for self-improvement; communicate effectively and adapt to new environments and societies.

Basic Requirements: As team members, engage in physical exercise to maintain health and promote self-actualization and team spirit; participate in various social practice activities to understand the basic principles of humanities and social sciences, adapt to social development, and take responsibility for the environment and society.

8) Professional Practice Courses

Expected Learning Outcomes: Cultivate students' experimental skills, engineering application capabilities, and innovation and practical abilities. Through practical training, students consolidate theoretical knowledge and elevate their application level, focusing

on enhancing their abilities to analyze and solve complex engineering problems using foundational and specialized knowledge.

Basic Requirements: Integrate theoretical knowledge and practical skills to solve real-world problems, strengthen foundational theoretical knowledge, deepen understanding of the transportation field, and enhance innovation capabilities.

9) Bachelor's Thesis

Expected Learning Outcomes: Ability to integrate knowledge and skills to analyze and solve engineering problems, execute and complete design tasks.

Basic Requirements: Complete the graduation design task under the guidance of a mentor, write the graduation thesis, and pass the defense.

Details regarding the class for each competency area can be found in Appendix 05-1. The credit distribution across the competency areas in the overall programme is illustrated in Figure 1-1.

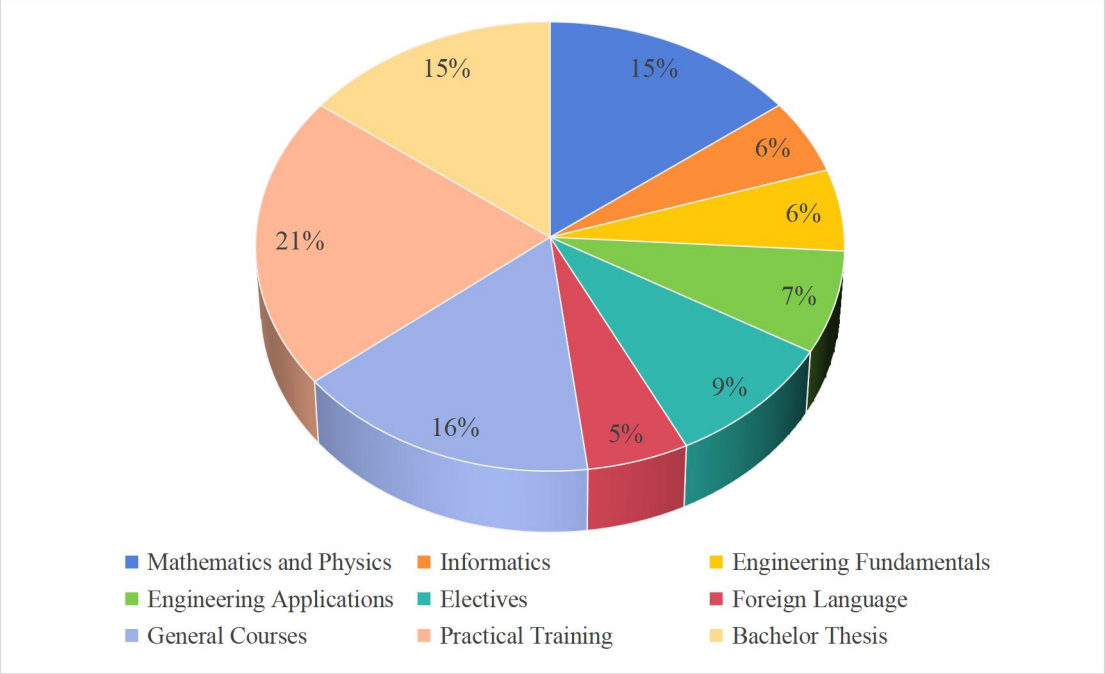

Figure 1-1 Credit composition of different competency areas.

To provide a comprehensive and visual understanding of the curriculum structure, Figure 1-2 presents the Curriculum Overview Diagram. This diagram shows the semester-wise arrangement of all modules, ECTS distribution, and the interrelationship among courses, supporting the organic integration and progression of learning throughout the four-year programme.

For further details on credit and workload for each course, see Appendix 08 and Appendix 15-1.

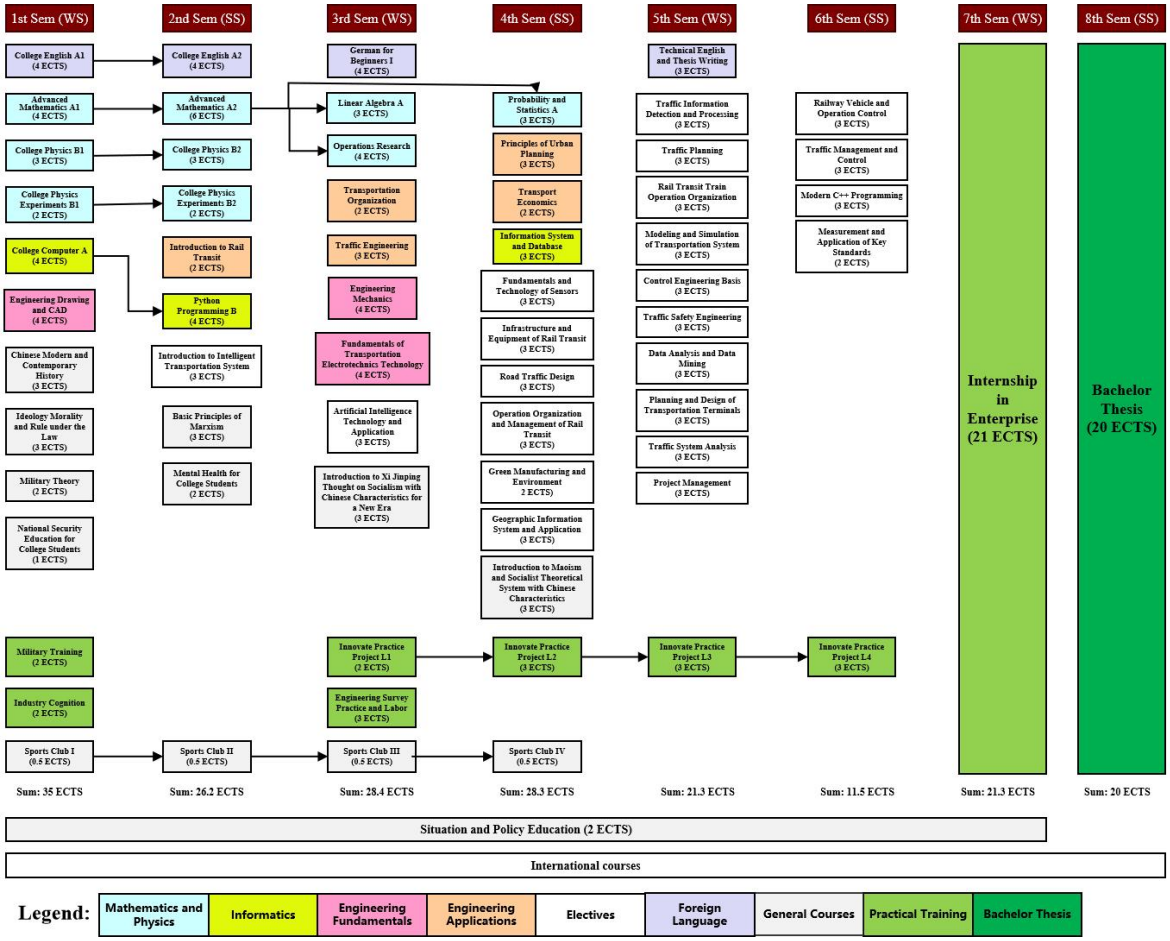

Figure 1-2 Curriculum Overview: Semester-wise module distribution, ECTS credits, and progression structure.

1.3.3 Student mobility

The Transportation Programme at Shenzhen Technology University actively promotes student mobility and international exchange, providing students with a global perspective and rich intercultural experiences throughout their studies.

Exchange and Recognition Mechanism:

According to the "Transportation Undergraduate Talent Development Program in 2024" (see Appendix 05-1), students are encouraged to participate in exchange programmes at any stage of their four-year study. Credits earned at partner universities abroad are recognized in accordance with institutional agreements (see Appendix 01-6). SZTU offers more than 30 student exchange projects annually (see Appendix 10-1). Information about joint programmes and exchange opportunities is regularly published by the university, and responsible faculty members provide timely notifications to students. All interested and eligible students may apply, and selection is conducted through a comprehensive process. Credits acquired during international exchanges can be transferred back to SZTU after approval at the beginning of each semester.

International Partnerships and Events:

The College of Urban Transportation and Logistics has established extensive partnerships with nearly 30 renowned universities worldwide, including Heilbronn University of Applied Sciences and Augsburg University of Applied Sciences in Germany. The "International Week" event, held annually at SZTU, further enriches students' global exposure. For example:

- In September 2023, over 50 professors and scholars from Germany, Switzerland, and other countries, along with more than 20 international students, participated in the International Week at SZTU.
- In September 2024, the event expanded to include 60 professors and more than 40 international students from countries such as Germany, Switzerland, Austria, Australia, the USA, Singapore, Canada, Italy, Russia, Serbia, and India.
- Over the past two years, the college has offered 17 international courses during International Week, involving various disciplines (see Appendix 10-3).

Outbound Mobility and International Experience

The college actively encourages and organizes students to participate in overseas exchange programmes. For example:

- In 2019, 32 students took part in the "Industry 4.0" Winter School in Augsburg, Germany, gaining first-hand experience of German education, advanced manufacturing, and the German language.
- Several undergraduate students have completed exchange semesters at institutions such as the Management Center Innsbruck (Austria), Würzburg-Schweinfurt University of Applied Sciences, Heilbronn University of Applied Sciences, Ingolstadt University of Applied Sciences, and Augsburg University of Applied Sciences. These experiences have broadened students' international horizons and enhanced their innovative capabilities.
- Many graduates from the Transportation Programme have pursued further studies abroad (see Appendix 10-2).

International Cooperation and Academic Activities

The college is committed to deepening international collaboration with both academic and industry partners. Notable initiatives include:

- Joint research and academic exchange projects with Heilbronn University of Applied Sciences and Würth Electronics Group, exploring collaboration in the fields of automotive, transportation, and logistics.
- In 2019, a delegation from Heilbronn University visited SZTU to discuss future development, academic construction, and visited the Sino-German Beer Brewing Process Control Laboratory.
- Cooperation with the University of Applied Sciences and Arts Northwestern Switzerland on student training programmes, continuously enhancing the international outlook and innovative abilities of faculty and students.

- Co-hosting of international events such as the “Innovation Dialogue: Leverage Innovation in the GBA through University Cooperation” with the German Chamber of Commerce (Guangzhou), and organizing high-level conferences, including the “Digital Logistics and Supply Chain Management – Digital Empowerment of Supply Chain Value Reconstruction to Promote High-Quality Economic Development” (DILSCM 2023), as well as the COTA International Conference of Transportation Professionals (CICTP 2023 and CICTP 2024), attracting numerous domestic and international experts and scholars (see Appendix 10-5).

Support for International Students and English-taught Courses

To attract and support international students, the college currently offers five courses taught in English and plans to expand bilingual teaching. Efforts are being made to improve the English proficiency of faculty and provide additional Chinese language training to help international students adapt to campus life and academic requirements at SZTU.

Conclusion

Through a wide range of exchange programmes, international partnerships, academic events, and bilingual course offerings, the College of Urban Transportation and Logistics provides students with exceptional opportunities for international exposure, cross-cultural competence, and global competitiveness. The college remains committed to further expanding its internationalization efforts and providing a broader platform for both students and faculty.

1.3.4 Periodic review of the programme

Shenzhen Technology University has established a comprehensive and systematic teaching evaluation system, encompassing multiple aspects such as student evaluations, teaching inspections, and teaching supervision through class observations, to ensure the continuous improvement of teaching quality.

Firstly, the university conducts student evaluations every semester, where students objectively assess courses and instructors based on four dimensions: teaching attitude, teaching content, teaching methods, and learning outcomes (see Appendix 22-3 for details). To ensure fairness and confidentiality, the university strictly safeguards the identities of evaluators, the evaluation process, and the content of evaluations.

Secondly, the university implements a multi-level teaching inspection mechanism each semester, primarily led by individual colleges with supplementary checks by the Department of Academic Affairs. The inspection covers the execution of teaching plans, lesson preparation, classroom teaching effectiveness, teaching discipline, and teaching management. Colleges organize observation teams and peer instructors to conduct classroom observations, providing detailed records and feedback (see Appendix 22-5). Additionally, colleges inspect the implementation of professional internships, the archiving of graduation thesis (design) materials, the progress of industry-university

cooperation projects, and the operation of off-campus internship bases. Feedback is also collected through student forums, forming comprehensive records and improvement recommendations.

At the same time, university leaders and the University Teaching Supervision Committee regularly conduct in-class observations to comprehensively evaluate instructors' teaching attitudes, content, methods, and effectiveness. Members of the supervision team attend courses across various disciplines, engage in extensive communication with both instructors and students, and ensure continuous monitoring and improvement of teaching quality.

Based on the main issues identified in teaching inspections and student evaluations, colleges communicate with instructors annually. Teachers then engage in teaching reflection and optimize teaching content based on evaluation results. Simultaneously, college committees for teaching affairs dynamically adjust and optimize curriculum by integrating evaluation and inspection results, forming a closed-loop of "evaluation-feedback-improvement" to continuously enhance teaching quality.

1.4 Admission requirement

1.4.1 Admission and entry conditions

Applicants to the undergraduate programme at Shenzhen Technology University (SZTU) must participate in the National University Entrance Examination (Gaokao) of the People's Republic of China or the unified entrance exam administered by relevant provinces or cities. The minimum requirements for application are as follows:

- Compliance with the Constitution and laws of the People's Republic of China.
- Graduation from high school or equivalent education.
- Passing a physical examination and meeting the basic health requirements for the chosen major (see Appendix 11).

1.4.2 Admission process

During the admission stage, SZTU's Admissions Department evaluates candidates comprehensively, focusing on academic excellence and physical fitness, in accordance with the university's admission plan (see Appendix 11). The process is as follows:

- Provincial Requirements:

In Guangdong Province, applicants must pass three elective high school subjects included in the total score of the Gaokao.

- Parallel Preference Selection:

In provinces implementing the Parallel Preference system, SZTU adjusts enrollment plans and ratios according to the regulations of each province or city.

- Selection Criteria:

Candidates who meet the ideological and moral assessment and physical health requirements (note: students with color blindness are not eligible for the Transportation major), achieve the minimum batch score in the unified examination, and meet the university's promotion standards will be selected based on their scores, professional preferences, and the university's admission principles. SZTU is equipped with barrier-free facilities for students with disabilities.

- Category-Based Admission:

When majors are categorized (e.g., history, science, engineering), the "score priority" principle is applied, and candidates are admitted in descending order of total scores, according to the rules of each province.

The standard admission process includes application, review, pre-admission, admission inspection, and issuance of admission notices.

Upon arrival, new students must present their admission letter and identification, and complete registration procedures, including confirming enrollment, paying tuition, registering student status, and receiving learning materials.

- The total Gaokao score is 750.
- Approximately 80% of students are from Guangdong Province.
- Over the past three years, the lowest admission score for the Transportation major in Guangdong was 565, placing students in the top 14% of science-track candidates in the province (see Appendix 12-1).
- Student quality has continued to rise in recent years.
- In the past five years, there has been only one dropout.
- For 2019 and 2020 entrants, the average length of study is 4.14 years.

1.4.3 Transparent admission procedures

SZTU strictly adheres to relevant regulations to ensure a transparent and fair admission process. According to the Education Law of the People's Republic of China, undergraduate admissions in China follow a system of "university responsibility, recruitment office supervision," with classification and admission based on control scores set by provincial admission committees for different categories (general, cultural and historical, science and engineering, arts).

The university has issued official documents such as the "SZTU 2019 Enrollment Promotion Work Plan" (see Appendix 11-1) and the "SZTU 2024 Summer General College Entrance Examination Admission Regulations" (see Appendix 11-2) to standardize procedures and enhance information dissemination.

SZTU is responsible for providing explanations to unsuccessful candidates and resolving related issues. Provincial recruitment offices supervise the release of qualified student records to higher education institutions, oversee the implementation of national enrollment policies, and ensure compliance with regulations. They also have the authority to correct any violations of national admissions policies and procedures.

1.5 Workload and credit points

At Shenzhen Technology University, the calculation of workload and credit points is guided by both national and international standards. For theoretical courses, one credit is awarded for every 18 contact hours, while for practical training courses, one credit corresponds to 30 contact hours. In the Chinese higher education system, only contact hours are considered when calculating credit points. However, under the European Credit Transfer and Accumulation System (ECTS), the total workload includes both contact hours and self-study hours. Typically, one ECTS credit is equivalent to 30 hours of total student work, including lectures, practical sessions, and independent study.

When converting Chinese credits into ECTS credits, the workload for one academic year at SZTU averages 48 ECTS credits, or approximately 1,440 study hours. This approach ensures that the workload and credit structure of the Transportation Programme align with international practices and facilitate student mobility and credit recognition across borders.

1.5.1 Study hours (workload)/Contact hours, credit points and self-study

Detailed information on the study hours and credit points for each course module is provided in Appendix 15-1, and individual course syllabi can be found in Appendix 09-1.

Table 1-3 summarizes the distribution of contact hours, self-study hours, and total study hours in the four-year programme, illustrating the workload structure for compulsory courses, professional courses, electives, and language modules.

Table 1-3 Overview of study hours of the four-year programme.

	Contact hours	Self-study hours	Total study hours
Science and Engineering Courses	1620	1080	2700
Language Courses	198	132	330
General Courses	576	384	960
Practical Training	702	468	1170
Bachelor's Thesis	180	420	600
Total Study Hours	3276	2484	5760
Required Courses	2628	2052	4680
Elective Courses	648	432	1080
Total	3276	2484	5760
Professional Courses	2034	1656	3690
Non-Professional Courses	1044	696	1740
Language Courses	198	132	330
Total	3276	2484	5760

1.5.2 Credit point system

Learning outcomes are primarily quantified by credit points. Upon completion of four years of study, each undergraduate must earn enough Chinese credits to be equivalent to 192 ECTS credits—an average of 48 ECTS credits per year.

The allocation of credit hours per semester is carefully planned to ensure a manageable workload and maintain teaching quality. Student test scores are reviewed by faculty, and counselors or academic advisors monitor each student's actual study load per semester to ensure it aligns with the planned workload.

Typically, each student is expected to complete approximately 720 study hours per semester (workload). Under the ECTS system, 30 study hours (including both contact and self-study hours) equal 1 ECTS credit point.

1.6 Didactics and teaching methodology

1.6.1 Classroom teaching and learning methods

The Transportation programme adopts a diverse and systematic approach to teaching and learning, combining traditional lectures and laboratory sessions with a wide range of innovative, student-centred didactical methods. These approaches are carefully embedded in the curriculum and module design to foster independent learning, problem-solving abilities, teamwork, and practical engineering competence.

The main teaching and learning methods systematically applied across the programme include:

(1) Project-based learning

Many core modules, such as Innovation Practice Project (L1-L4), Traffic Engineering, and Artificial Intelligence Technology and Application, require students to work in teams on open-ended, real-world engineering projects. These projects culminate in deliverables such as prototypes, design reports, and presentations, strengthening students' skills in problem-solving, teamwork, and innovation.

(2) Problem-based and case-based learning:

Modules like Transport Economics and Traffic System Analysis present students with authentic, open-ended problems or case studies. Students analyse, research, and collaboratively develop solutions, promoting analytical thinking, independent learning, and the ability to apply theoretical knowledge to practical scenarios.

(3) Cooperative and group learning:

Teamwork is systematically integrated into laboratory work, design modules, and seminars. Students are assigned clear roles and responsibilities within groups, learning to collaborate, communicate effectively, and reflect on group processes.

(4) Blended and flipped learning:

Courses such as Python Programming and College English utilize blended learning platforms (e.g., Chaoxing), where foundational content is delivered online for self-study prior to class. Classroom sessions are then dedicated to advanced discussions,

collaborative projects, and practical application, maximising student engagement and deep learning.

(5) Seminar-based teaching:

In modules such as Technical English and Thesis Writing, seminar-based teaching is adopted. Students engage in critical reading, discussion, peer review, and oral presentations, developing academic communication and research skills.

(6) Hands-on laboratories and inquiry-based experiments:

Experimental and practical modules emphasize inquiry-based and design experiments, where students independently design protocols, collect and analyse data, and present findings. This approach deepens understanding of theoretical knowledge and cultivates scientific reasoning and experimental skills.

The specific teaching and learning methods for each module are detailed in the corresponding course handbooks, which are provided in Appendix 09: Module Descriptions. The systematic application of these diverse teaching methods aims to support the achievement of the intended learning outcomes and to address the competence requirements of the programme.

1.6.2 Practical training and internship

In addition to classroom-based learning, practical training and internships are important components of the undergraduate curriculum. The programme clearly defines the allocation of hours for theoretical study, practical training, and self-directed learning.

A core element is the on-campus Innovation Practice Project, an integrated collaborative education model involving the university, industry, research institutes, and application sectors. This model aims to broaden students' knowledge, enhance professional and practical skills, and foster innovation and entrepreneurship. The Innovation Practice Project (L1 – L4) is a key part of this model, covering three focus areas: Intelligent Transportation and Smart Cities, Intelligent Maintenance and Control of Rail Transit, and Transportation Planning and Management. Each direction is supported by corresponding innovation practice workshops (led by different professors), and the courses are structured across four levels (L1 – L4), corresponding to the 3rd to 6th semesters. Teaching methods in these modules include project-based learning, problem-based learning, and cooperative learning.

Off-campus internships are another essential part of the curriculum, generally lasting 4 to 5 months and typically arranged in the 7th semester. All students are required to participate in internships at relevant enterprises. The process includes pre-internship placement confirmation, agreement signing, and on-site assessment of internship positions. The university and host companies jointly ensure the safety and quality of the internship environment.

Internship performance is assessed through practical work evaluation and a written internship report, reviewed by both company and university supervisors. Students

maintain daily records, and the university monitors progress through regular communication. Upon completion, students present their reports and receive feedback, which contributes to their final evaluation. Problem-based learning is mainly applied during the internship to encourage self-directed learning and the development of lifelong learning skills.

1.6.3 International exchange and mobility

Students in the programme have opportunities to participate in international exchange semesters at partner universities, particularly in Germany. The College of Urban Transportation and Logistics has established partnerships with institutions such as Heilbronn University of Applied Sciences, Augsburg University of Applied Sciences, Würzburg-Schweinfurt University of Applied Sciences, and Ingolstadt University of Applied Sciences. These exchange programmes enable students to study abroad, gain international perspectives, and expand their academic and cultural horizons. Credits earned during exchange programmes are recognized by both the home and host institutions. Students are encouraged to select exchange opportunities that align with their academic and career goals, especially in fields related to intelligent transportation, logistics, and urban planning.

1.6.4 Teaching quality assurance

The university implements comprehensive teaching evaluations for all courses (see Appendix 22). These include student feedback on course content and teaching methods, peer evaluations of teaching effectiveness, assessments by academic leaders, and supervision by the university's monitoring group. The results help to identify areas for improvement and provide feedback to instructors, supporting the continuous enhancement of teaching quality. All courses are regularly evaluated in accordance with university regulations to ensure ongoing quality assurance and improvement.

2. Exams: System, Concept & Organisation

2.1 Examination methods

Course assessment is a critical component for evaluating both student learning progress and teaching effectiveness. According to the "Shenzhen Technology University Undergraduate Course Assessment Methods (Trial)" (see Appendix 17-1) and the "Assessment Reform Plan" (see Appendix 02-2), all undergraduate students must participate in assessments for both compulsory and elective courses as specified in the curriculum. Only students who achieve a passing grade in the assessment will earn the corresponding credits.

Organization and Management

The assessment process is jointly organized and managed by the university and its colleges. The Department of Academic Affairs is responsible for overall coordination, administration, and centralized management of course assessment records, while colleges handle the specific implementation of each assessment. Assessment methods for each course are determined during the course planning stage and must be officially filed with the university.

Assessment Methods

Assessment of undergraduate courses typically combines ongoing (continuous) assessment and final examination. Grading criteria and assessment methods are announced to students at the start of each course.

Ongoing Assessment:

This may include attendance, individual and group assignments, quizzes, class discussions, literature reviews, course projects, experiments, survey reports, and midterm exams. The specific forms, content, timelines, grading standards, and weightings are determined by the course team and communicated to students in the first class.

Final Examination:

Most final exams are written, either closed-book or open-book, as determined by the course instructor. Any alternative exam formats must be reported to the college six weeks in advance and filed with the Department of Academic Affairs upon approval.

Grading and Grade Points

The final grade for a course is a composite of the ongoing assessment score, the score for basic questions in the final exam, and—if applicable—the score for additional (advanced) questions. The weighting of each component is determined by the college. For courses with advanced questions, students must achieve at least 75 points on the basic questions to be eligible for the additional section, and must score at least 18 points in that section for the score to be valid.

Grades are recorded on the official "Shenzhen Technology University Student Assessment Form," which includes columns for ongoing assessment, final exam (basic and additional questions), and the final course grade. The university uses the Grade Point Average (GPA) as a key metric for academic performance. The formula for calculating the GPA is as follows:

$$\text{Grade Point Average(GPA)} = \frac{\sum \text{Grade Points of each course} \times \text{Credits of the course}}{\sum \text{Credits of all courses}}$$

The comparison between the combined basic course score, additional question score, overall evaluation score, and grade points is shown in Table 2-1.

Table 2-1 Grade conversion methods.

Overall evaluation score	Corresponding grade points	Courses with additional questions		Courses without additional questions
		Combined	Additional	Combined

		basic score	question score	basic score
A+	4.5	100-93	30-0	100-93
		92-85	30-18	
		84-80	30-24	
A	4.0	92-85	<18	92-85
		84-80	23-18	
B+	3.5	84-80	<18	84-80
B	3	79-75	Not Calculated	79-75
C+	2.5	74-70	Not Calculated	74-70
C	2.0	69-65	Not Calculated	69-65
D	1.0	64-60	Not Calculated	64-60

Deferred and Make-Up Examinations

Students who are unable to attend exams due to valid reasons such as illness or emergencies may apply for deferred exams in accordance with university regulations (see Appendix 17-2). Unapproved absences are recorded as an F. Any violation of exam rules (cheating, misconduct) will also result in an F, and the transcript will note “Cheating” where applicable (see Appendix 17-3).

Students who fail a course must retake it to earn the required credits. There is no limit to the number of course retakes during the period of study, but all attempts are recorded in the academic transcript (see Appendix 17-4 for sample grade reports).

Bachelor’s Thesis Assessment

In the eighth semester, students are required to complete a 16-week bachelor’s thesis under faculty supervision, in accordance with the “Graduation Thesis (Design) Implementation Measures” (see Appendix 17-8). The thesis topic, tasks, and timeline are outlined in the official assignment document (see Appendix 17-9).

Thesis supervisors must hold at least an intermediate professional title and have strong teaching, research, and practical experience. Each supervisor typically guides no more than five students. Supervisors are responsible for supporting students in topic selection, research planning, progress checks (at least three times per week), and providing revision feedback (at least twice). The thesis must be formatted according to university specifications (see Appendix 17-10).

After thesis submission, a defense committee of 5 – 7 members assesses the student’s performance and determines the final grade, taking into account the supervisor’s and reviewers’ comments. The final result is recorded in the official “Undergraduate Thesis Grade Assessment Form” (see Appendix 17-11).

2.2 Organization of examinations

The scheduling and organization of final examinations at Shenzhen Technology University strictly follow the university’s academic calendar and standardized procedures to ensure fairness and transparency.

Examination Scheduling

Final examinations are generally held during the last two weeks of each semester. The Department of Academic Affairs centrally arranges and publishes the examination schedule at least one week prior to the exam period. Once published, the schedule is not subject to change except under exceptional circumstances, in which case approval from the Department of Academic Affairs is required. If an early exam is needed due to special teaching arrangements, the instructor must submit a written application, which must be reviewed by the relevant college (department) and then approved by the Department of Academic Affairs before any adjustments are made.

Examination Paper Preparation

All final examination papers must be based on the course syllabus and teaching content, with a focus on assessing the achievement of the defined learning outcomes. The questions should cover the appropriate scope, difficulty, and content breadth to effectively differentiate students' mastery of knowledge and skills, as well as their ability to analyze and solve problems. Emphasis is also placed on assessing students' creativity and innovative thinking.

For each course, two versions of the exam paper—Paper A and Paper B—must be prepared. Both versions must cover the same content scope, have equivalent difficulty, and contain a similar number of questions. The A and B papers are used separately for the main exam and deferred exam. There must be no identical questions between the two versions, and each question must be independent, with clear and precise wording and instructions to avoid ambiguity.

The examination papers, along with reference answers, must be reviewed by the respective college (department) before the exam. Both the paper preparer and the reviewer are jointly responsible for the quality and accuracy of the examination materials. After exams are completed and graded, the papers are submitted to the college for spot checks to ensure compliance with the syllabus and assessment standards.

Grading and Results Management

Instructors are responsible for grading the exam papers objectively and consistently, in accordance with the established grading criteria. Grading must be carried out with a red pen, and points awarded or deducted must be clearly indicated. Any amendments to scores must be signed at the point of change. Instructors must carefully verify the total scores before submission.

Upon completion of grading, each instructor is required to conduct a quality analysis of the examination. The analysis should include basic information about the course, students, and instructor, the exam format, statistical analysis of student performance, and qualitative evaluations of the exam and teaching. **Suggestions for future course improvements should also be included**. The results and analysis must be submitted to

the college, filed with the Department of Academic Affairs, and completed within the specified timeframe.

All grades must be promptly entered into the university's Academic Management System. The printed grade assessment forms, signed by the instructor, must be submitted to the college (department) and then to the Department of Academic Affairs before the start of the holiday. Deferred exam grading must be completed within one day after the deferred examination takes place.

Grade Changes and Appeals

Once grades are entered into the system, they cannot be altered unless a clear error is identified. In such cases, the instructor must complete the "Course Grade Change Registration Form" and provide supporting original documentation (e.g., exam papers, grade records). The grade change request must be verified by the college (department) and approved by the Department of Academic Affairs before any change can be made in the system.

2.3 Systematic review process for examinations

To ensure that examinations accurately assess the intended learning outcomes and uphold high academic standards, Shenzhen Technology University has established a rigorous and systematic review process for all courses with final examinations.

2.3.1 Examination question setting and approval

After completing the design of examination questions, instructors must submit the exam papers and suggested solutions for multi-level review and approval:

(1) Departmental Review:

Exam papers and solutions are first reviewed and signed by the department head, who verifies alignment with the course's intended learning outcomes and assessment of required competencies.

(2) College-Level Approval:

Next, materials are submitted to the Associate Dean for Academic Affairs of the college for further review and approval.

(3) University Audit:

Once dual approvals are obtained, the exam papers are submitted to the university's Academic Administration Office.

The Academic Administration Office then conducts systematic spot-checks on all submitted final exam papers. Special attention is given to the repetition rate of questions compared to previous years' exams; a maximum threshold of 10% repetition is allowed. If the repetition rate exceeds this threshold, exam papers are returned to instructors for revision. Revisions must be made until the exam content meets the required standard before the papers can be used.

2.3.2 Post-examination review and analysis

Following each course examination, a comprehensive post-examination review is conducted to evaluate assessment effectiveness and drive continuous improvement:

- Grading and Results Release:

Instructors complete grading and release student results within the prescribed timeline.

- Examination Analysis Report:

Instructors must submit a detailed analysis report, which includes:

1) Assessment Content Review: Mapping of exam content to course learning outcomes.

2) Examination Format Analysis: Overview of question types (e.g., multiple choice, short answer, problem-solving, essays) and their weightings.

3) Statistical Performance Analysis: Student score distribution, including mean, median, standard deviation, and grades.

4) Item Analysis: Evaluation of each question's difficulty and discrimination index.

5) Validity and Reliability Assessment: Analysis of how well the exam measures intended outcomes and produces reliable results.

6) Critical Evaluation: Identification of ambiguous, overly difficult, or misaligned questions.

7) Improvement Recommendations: Suggestions for future exam design, including modifications to questions, format, or content.

- High Grade Proportion Reporting:

For courses where more than 10% of students receive an A+ grade, instructors are required to submit an additional explanatory statement, justifying the high proportion of top grades.

This review process helps ensure that all examinations are fair, effective, and continuously improved to maintain high academic quality.

2.4 Make-up examinations

According to the “Shenzhen Technology University Undergraduate Makeup Exam Management Regulations (Trial)” (see Appendix 17-6), during their study period, students who fail any compulsory courses listed in their major’s curriculum are given an opportunity to retake the exam. No fees are charged for make-up exams. The specific rules are as follows:

Scheduling and Organization:

Make-up exams are arranged before the start of each semester and are conducted together with deferred exams. The Department of Academic Affairs is responsible for centralized organization and scheduling. Exam timetables are published online within two

weeks after the previous semester ends. Students are responsible for checking their own exam schedules.

Special Exam Formats:

For courses with non-standard exam formats, the offering department must inform students of specific arrangements, but all exams must be completed within the period set by the Department of Academic Affairs.

Attendance and Absence:

If students miss the make-up exam for personal reasons, no further exam time will be arranged, and the student must retake the course.

Invigilation:

The Department of Academic Affairs manages invigilation, with teaching units assigning invigilators according to requirements.

Conflict Resolution:

Make-up exams are scheduled to avoid conflicts. If unavoidable conflicts occur, students must choose one exam to attend; for missed exams, tuition fees for those course credits are waived for the current semester.

Deferred Exams:

For students taking deferred exams due to final exam conflicts, if they fail the deferred exam (excluding cases of cheating or unexcused absence), no additional make-up is arranged, but tuition for those credits is waived.

Grading:

The make-up exam score (including both basic and additional question scores) is considered the final exam grade for the course. For passed make-up exams, the final course grade is recorded as “D”. Instructors must enter make-up exam grades within one week after the exam.

2.5 Deferred examinations

According to the “Shenzhen Technology University Regulations on Deferred Final Examinations (Trial)” (see Appendix 17-2), the following provisions apply:

Eligibility:

- Students may apply for a deferred exam if there is a scheduling conflict between two or more final exams.
- Students unable to attend due to illness may apply, with a diagnosis certificate from a university-designated hospital.
- Deferred exams for other reasons are generally not approved.
- Deferred exams are not permitted for courses where the final exam has already been taken.

Application Process:

- Students must apply online before the exam, specifying which course to defer (typically, compulsory courses take priority; electives are deferred).
- Approval from the Department of Academic Affairs is required.
- For non-written exam formats, deferred exams are generally not allowed unless approved by the instructor.
- Deferred exams are scheduled before the next semester starts; students must return and prepare accordingly.

Medical Reasons:

- Applications must be accompanied by a same-day diagnosis certificate from a designated hospital.
- If a student is bedridden, an authorized person may apply with written authorization and the relevant documents.
- Diagnosis from off-campus hospitals must be approved by a university-designated hospital.
- In emergencies, applications must be completed no later than the day after the scheduled exam, with proper documentation.

Grade Recording:

- When a deferred exam is approved, the course grade is temporarily recorded as “F” with “Absent” noted.
- After the deferred exam, the final grade is calculated based on the deferred exam and regular performance scores, and the grade is updated.

Further Requirements:

- Students must attend the deferred exam as scheduled.
- Those who fail or are absent from the deferred exam must retake the course according to university retake policies (see Appendix 17-4).

3. Resources

3.1 Staff and staff development

3.1.1 Staff

The College of Urban Transportation and Logistics at Shenzhen Technology University employs a total of 84 staff members, including 8 professors, 15 associate professors, 45 master supervisors, and 1 doctoral supervisor. Notably, 25 staff members have been recognized as high-level talents in Shenzhen. The college features a research and teaching team with advanced educational backgrounds, robust teaching capabilities, and a rational structure in terms of professional title, age, and education. Many faculty members are “double-qualified” (possessing both academic and practical experience).

(1) Staff Composition

The Transportation major has established a strong teaching team with diverse academic backgrounds and a balanced age structure. There are 19 full-time faculty members, including 2 professors, 7 associate professors, 3 assistant professors/lecturers, and 7 full-time laboratory technicians. Among them, 63% hold a doctoral degree and 84% are under the age of 40. Faculty expertise covers transportation, mechanical and electronic engineering, control science, geographic information science, data science, and vehicle engineering—fully meeting the multidisciplinary needs of the programme. (See Appendix 19-1 for faculty CVs.)

(2) Teaching and Research Development

- Teaching Achievements:

The programme offers over 10 core undergraduate courses, serving both its own students and those from other majors. From January 2019 to November 2024, faculty members recommended two national first-class courses, received approval for one provincial and one university-level first-class course, and led 6 Guangdong provincial education reform projects, 13 university-level reform projects, and 10 university-enterprise cooperation projects. In addition, faculty published 28 teaching-related papers, 7 textbooks, and 1 monograph. Two faculty members have been honored as provincial/municipal outstanding teachers.

Representative curriculum projects and excellent courses are listed below:

Table 3-1 Key Curriculum Development Projects and Excellent Courses

No.	Project type	Course
1	Provincial first-class undergraduate courses	Introduction to rail transit
2	Guangdong, Hong Kong and Macao Greater Bay Area International Education Demonstration Zone construction project	A study on the construction of application-oriented talent education curriculum system in the Guangdong-Hong Kong-Macao Greater Bay Area, which is oriented towards job-base connection and student heterogeneity

- Scientific Research:

In the past five years, faculty have completed 45 research projects, including 8 funded by the National Natural Science Foundation of China and provincial commissions, 6 municipal/departmental projects, and 31 university-enterprise cooperation projects, with a total research budget exceeding 20 million RMB (see Appendix 19-2 for representative projects). Over 100 high-level research papers have been published, including 14 in JCR Q1 journals (see Appendix 19-3). The team has also been granted more than 20 invention patents (see Appendix 19-4).

Representative textbooks and monographs are as follows:

Table 3-2 Representative textbooks and monographs.

No.	Author	Name	Publish and date of publication
1	Xiaohong Yin, Tian Lei	Vehicle-road collaborative sensing and communication technology	Southwest Jiaotong University Press, 2024
2	Qin Luo, Jingjing Chen	Intelligent management of urban rail transit station -- theory and practice	South China University of Technology Press, 2023
3	Qin Luo, Jingjing Chen	Introduction to Urban Rail Transit (2nd Edition)	Southwest Jiaotong University Press, 2021
4	Xiongfei Zhang	Urban rail transit demand analysis and network planning	Southwest Jiaotong University Press, 2020

(3) Faculty Workload

Each faculty member responsible for undergraduate teaching in the programme is required to complete a total workload equivalent to 360 teaching hours per year. This workload is not limited to classroom teaching; it also includes a wide range of activities that support student learning and professional development. Specifically, the annual workload covers:

1) Classroom teaching (lectures, seminars, laboratory sessions)

2) Supervision of student internships and enterprise practice

3) Supervision and guidance of undergraduate thesis projects

4) Guidance for graduate students (where applicable)

5) Mentoring students in innovation and entrepreneurship projects

6) Coaching and supporting students in academic competitions and disciplinary contests

7) Curriculum development and course improvement activities

Serving as an academic tutor and providing scientific and innovative guidance for students are also important components of faculty responsibilities and are considered in faculty evaluation and promotion.

By distributing the workload across diverse teaching, practical, and mentoring activities, the programme ensures that each student receives comprehensive guidance and support, both inside and outside the classroom, to help them achieve the intended learning outcomes.

3.1.2 Staff development

(1) Teaching Ability Enhancement and Training

Shenzhen Technology University has developed a comprehensive system to support faculty teaching development, as outlined in documents such as the “Plan for the Promotion of Young Teachers’ Education and Teaching Ability” and the “Laboratory Technical Personnel Training Management Measures” (see Appendices 02-3, 02-4). This system includes teacher training, academic exchange, teaching evaluations, research, and

educational consulting, all aimed at advancing teaching innovation, improving teaching quality, and fostering a highly skilled and motivated faculty.

1) Mentorship system. The college appoints experienced and outstanding teachers as mentors for young faculty members. This one-on-one mentorship focuses on professional ethics, course delivery, research competence, and practical skills. Mentors provide guidance and support to help new teachers quickly adapt to teaching requirements and develop into effective educators with strong subject knowledge and classroom management skills.

2) Laboratory Technician Training. Laboratory technicians receive ongoing professional development through short-term training programmes, seminars, and professional courses. The system also encourages further education, systematic learning, and qualification improvement, including opportunities for full-time study or targeted professional training, to enhance technical skills and support laboratory-based teaching and research.

(2) Enterprise practice and industry collaboration

The college places significant emphasis on strengthening the enterprise practice capabilities of its faculty. Through deep collaborations with leading companies such as the Urban Planning & Design Institute of Shenzhen (UPDIS), SF Express, and Shenzhen Metro Group, the college has established joint labs, internship bases, and talent training programmes (see Appendix 19-5). These partnerships promote the integration of industry, academia, and research.

Faculty members actively participate in enterprise-commissioned research projects, covering areas such as intelligent traffic management, urban rail transit optimization, and big data-driven traffic prediction (see Appendix 19-6). Over the past five years, total project funding has exceeded 16 million RMB. These activities not only improve faculty's technical application skills but also ensure that teaching content remains closely aligned with industry advancements.

Details of faculty enterprise and international experience are provided in Appendix 19-7.

(3) Funding and Support

Faculty development is strongly supported by multi-level funding from national, provincial, municipal, and university sources:

Government Support:

- Shenzhen provides a living allowance of 1.6 million RMB for overseas high-level talents, and 360,000 RMB for postdoctoral researchers or new arrivals.
- The "Pengcheng Peacock Plan" and other talent programs offer research startup funds of 2.7 – 3 million RMB for newly introduced high-end talents.

University Support:

- The “Runyuan Youth PI Selection Program” gives selected young faculty an annual subsidy of 100,000 RMB for academic visits, exchanges, and living expenses.
- Young teachers can receive up to 20,000 RMB per international conference for attending overseas academic events.
- The university encourages and funds overseas academic visits to foster global research capacity and international exchange.

To improve the efficiency of research funding and monitor progress, the college launched an “Equipment Usage Time Statistics System” in August 2024 to track the utilization of research equipment and support research management.

Table 3-3 Funding Details for the Programme.

No.	Project Name	Funding Amount	Funding Source	Expenditure Category
1	Shenzhen Overseas High-Level Talent Project	1.6 million RMB	Government	Living allowance
2	Postdoctoral Researchers and Personnel Coming to Work in Shenzhen	360,000 RMB	Government	Living allowance
3	Shenzhen Overseas High-Level Talent and "Pengcheng Peacock Plan"	2.7 million to 3 million RMB	Government	Research startup fund
4	Runyuan Youth PI Selection Program	100,000 RMB	University	Academic visits and exchange, living allowance
5	Young Teachers' International Conference Funding	Up to 20,000 RMB	University	Overseas conference attendance funding

3.2 Student support and student services

(1) Department of Academic Affairs

The Department of Academic Affairs is responsible for academic planning and quality assurance. Its main functions include:

- Developing and releasing course schedules and academic calendars each semester;
- Coordinating with academic departments to ensure curriculum alignment with programme objectives;
- Overseeing course selection, syllabus development, and teaching activities;
- Conducting regular academic inspections and quality evaluations, including documentation and feedback;
- Implementing a multi-level quality assurance framework at both university and department levels.

Faculty and students access academic services and resources through the university’s unified portal and academic management system. Access is restricted to authorized university accounts.

(2) Student Affairs Department

The Student Affairs Department is dedicated to holistic student support, focusing on:

- Ideological and moral education;
- Administrative management and campus culture development;
- Academic advising, including course selection and degree planning;
- Tutoring, peer support, and academic skills workshops (e.g., time management, exam preparation);
- Monitoring academic progress in collaboration with faculty and providing targeted interventions;
- Managing scholarships, awards, financial aid, housing, and mental health education;
- Offering career guidance and employment support.

(3) Undergraduate student counselor system

Each major and class is assigned a full-time counselor who:

- Supports students' daily life and psychological well-being;
- Maintains communication with families and organizes cultural/recreational activities;
- Guides new students in major selection and career planning;
- Helps sophomores and juniors refine career objectives, and provides seniors with employment information and interview coaching;
- Organizes experience-sharing sessions and skills workshops, including training on professional engineering software with faculty or industry experts.

(4) Academic mentorship system

Every undergraduate is paired with an academic mentor (usually a full-time faculty member) who:

- Provides guidance on academic, professional, and personal development;
- Offers advice on learning strategies, research, and career planning;
- Encourages participation in research projects, innovation activities, and competitions.

(5) Corporate internship and corporate mentorship

The university provides organized, high-quality internship experiences, managed as follows:

- Each college forms an internship steering committee and submits plans for approval;
- Internship sites are selected for safety, relevance, and quality;
- Students participate in real corporate R&D projects;
- A formal internship plan and syllabus are documented and approved;
- Preparations include supervisor assignment, company liaison, safety education, and insurance;
- Supervision and support are maintained throughout, with 1 faculty supervisor for every 5 – 10 students;
- Post-internship, feedback and reports are submitted for review and archiving;

- Corporate mentors (from the host company) and university supervisors jointly guide students.

(6) Teaching quality assurance system

The university has a robust teaching quality assurance system that includes:

- Continuous monitoring of teaching processes, platforms, and classroom dynamics;
- Internal self-assessment and supervision by a teaching supervision committee;
- Three-tiered responsibility involving programme leaders, instructors, and academic advisors;
- Mandatory pre-course design and evaluation for new courses;
- Student feedback and evaluations at the start, middle, and end of each semester, with actionable follow-up;
- Regular online inspections and feedback to drive continuous improvement.

(7) Major transfer policy

Students may apply for a major transfer after their first year, subject to university policies and programme capacity. Restrictions apply to students in special programmes or with prior agreements. Transfers require formal application, review, and approval, and students must meet the credit requirements of the new major to graduate.

(8) Minor programme and secondary degree option

Qualified undergraduates may apply for a minor or secondary degree after their first year. Applications undergo review and public announcement. To earn a minor certificate, students must complete prescribed credits for both the major and minor. Credits cannot be double-counted. Failing two or more required courses or disciplinary violations may lead to dismissal from the minor programme. Fees apply as per university regulations.

(9) Employment support and career development

The university and college provide comprehensive career support, including:

1) Campus Recruitment Fairs: The university and the College of Urban Transportation and Logistics organize large-scale campus recruitment fairs twice a year, in both the spring and autumn semesters. Other times, the college also organizes some small-scale campus job fairs aperiodically. These recruitment fairs bring a wide range of potential employers from various industries, allowing students to meet with recruiters, explore job opportunities, and network with industry professionals. These fairs play a crucial role in helping students gain insights into job market trends and industry requirements.

2) Employment Mobilization Team: An employment mobilization team is established each year to provide ongoing support to graduating students. The team consists of the dean, vice dean, programme directors, and the class advisor for the graduating students. This team closely monitors students' employment progress and organizes regular meetings to track job placement efforts. They also offer personalized

guidance and resources to help students improve their job search strategies, ensuring that they are well-prepared for the job market.

3) Alumni-led Employment Seminars: To enhance students' understanding of the job market and provide valuable career advice, the college invites successful alumni to return and conduct employment seminars. These seminars allow alumni to share their real-world experiences, offer tips on job applications and interviews, and provide insights into the transition from academic life to professional careers. These sessions help students gain a clearer understanding of the employment process and industry expectations.

4) Career Guidance and Counseling: In addition to recruitment fairs and alumni seminars, the Student Affairs Department provides career counseling and guidance to support students in exploring career options, preparing resumes, and navigating the job application process. Students are encouraged to utilize these resources to enhance their employability and prepare for successful career paths.

3.3 Funds and equipment

3.3.1 Investment in the last five years

The programme is well-supported with sufficient teaching funds to meet all routine teaching and project development needs. Over the past five years, a total of RMB 69.32 million has been invested in teaching-related activities. The detailed breakdown is shown in Table 3-4. Major areas of investment include:

- Internship and practice expenses: RMB 501,400
- Teaching expenses (including materials and resources): RMB 63,331,300
- Laboratory maintenance fees: RMB 2,044,400
- Industry-university cooperation (education and employment): RMB 2,206,900
- Internal development: RMB 1,242,800

Table 3-4 Teaching investment in the past 5 years.

Project name	Investment (Unit: 10,000 RMB)				
	2020	2021	2022	2023	2024
Internship and practice expenditures	8.69	9.89	14.72	12.55	4.29
Teaching expenses	877.58	1119.32	215.43	3231.74	889.06
Laboratory maintenance fee	16.57	16.29	20.81	46.99	103.78
Expenditures on education and employment of industry-university cooperation	11.09	10.83	24.09	112.6	62.08
Internal development expenses	4.62	18.13	22.70	27.89	50.94
Total	918.55	1174.46	297.75	3431.77	1110.15

3.3.2 Teaching and office facilities

The main teaching facilities for this programme include university buildings, the college's experimental center, and off-campus practice bases.

(1) Classrooms:

- 73 large classrooms (60 seats each) and 14 lecture halls (120 seats each), accommodating about 3,000 students in total.
- 83 smart classrooms equipped with advanced technologies:
  - 86-inch touch all-in-one computers (seminar and individual desk modes)
  - Interactive recording and broadcasting systems
  - 5G-enabled classrooms
  - Smart classroom systems with movable desks/chairs and centralized network control
- All ordinary classrooms are equipped with multimedia computers and projectors, with scheduling and resource application managed online.

(2) Experimental Center:

- The College of Urban Transportation and Logistics hosts three provincial and municipal key laboratories, including:
  - Guangdong Provincial University Rail Transit Intelligent Operation and Maintenance Engineering Technology Development Center
  - Guangdong Provincial University Intelligent Terminal Precision Components Engineering Technology Research Center
  - Shenzhen Municipal Key Laboratory of Urban Rail Transit
- Facilities include:
  - 43 undergraduate teaching laboratories
  - 5 scientific research laboratories
  - Over 10 research labs/institutes (e.g., Rail Transit Operation and Control Integration Lab, VR Lab for Rail Vehicles, Traffic Information Detection and Intelligent Road Lab, Intelligent Logistics Tech Lab)
- The Experimental Center supports teaching, research, and international cooperation, offering over 20 experimental courses and serving more than 1,000 students annually.

(3) Support Spaces:

- Adequate public and office space for faculty and staff
- Multiple small conference rooms and a lecture hall for seminars and academic presentations

(4) Facility Management:

- The Information Center, located on the top floor of the teaching building, is responsible for the management, maintenance, and repair of teaching and network facilities.

- Usage and scheduling of all multimedia classrooms are available through the educational administration management system, ensuring efficient resource utilization.

3.3.3 Enterprise practice platform

The programme has established a total of 22 off-campus practice and teaching bases (see Appendix 03-1 for full details), which provide abundant opportunities for students to gain practical experience. In accordance with the talent cultivation goals and curriculum requirements, the university and partner enterprises jointly develop internship syllabi, detailed instructions, and supporting measures. Each practice base assigns experienced enterprise mentors who, together with university faculty, guide and supervise students throughout their internships.

University instructors are responsible for explaining the internship objectives, tasks, schedules, and management regulations to the students before the start of each internship. Enterprise mentors are tasked with delivering essential training on workplace safety, professional conduct, company policies, and confidentiality. This dual-supervision model ensures that students receive comprehensive guidance and support during their practice period.

These off-campus practice bases are able to accommodate approximately 60 students from the Transportation Programme each year, effectively supporting various forms of practice-based teaching, such as professional internships and graduation projects. Through direct involvement in real-world engineering projects and daily operations, students are able to develop strong practical skills and problem-solving abilities. The enterprise practice platform is a key component in helping students bridge theory and practice, enhance their integrative competence, and achieve the overall educational objectives of the programme.

3.3.4 International cooperation

The College of Urban Transportation and Logistics is committed to building an internationalized environment for both education and research. Over the years, the college has established extensive partnerships with leading universities and enterprises in countries such as Germany, Switzerland, and more. Through initiatives like International Week and Winter School, students have the opportunity to experience different cultures, educational systems, and academic perspectives, broadening their global outlook.

The college has signed cooperation agreements with institutions including the University of Applied Sciences Heilbronn in Germany and the Würth Electronic Group, facilitating collaborative research and talent cultivation in the fields of automotive engineering, transportation, and logistics. In addition, the college works closely with international enterprises and chambers of commerce, such as the German Chamber of Commerce, to explore innovative models of university-industry collaboration in the

Greater Bay Area. These partnerships have resulted in joint forums, research projects, and the establishment of international internship bases, providing students with valuable practical experience in a global context.

The college also actively hosts and participates in international academic conferences, such as CICTP 2024, Pre-convention of CICTP 2023, and ILSCM 2023, offering a platform for scholars and professionals worldwide to exchange ideas, share knowledge, and foster academic innovation in transportation and logistics. In terms of mobility, students have participated in exchange programmes such as the “Industry 4.0” Winter School in Germany and have studied at partner universities across Europe, greatly enhancing their international competitiveness. Faculty members also benefit from opportunities for international academic exchange and cooperation.

These international cooperation projects and activities have not only improved the college’s teaching and research standards, but also provided students with a broader international stage, helping to cultivate graduates with a global vision and innovative spirit. The achievements and experiences from these collaborations form a strong foundation for the college’s ongoing internationalization strategy.

3.3.5 Laboratory

To ensure efficient and high-quality undergraduate experimental teaching, the College has established a comprehensive set of laboratory management documents based on university regulations (see Appendix 01-8). The Experimental Teaching Center director is responsible for overall organization, implementation, and compliance checks. A detailed list of laboratories is provided in Appendix 19-8.

(1) Management organization

The Urban Transportation and Logistics Experimental Teaching Center at Shenzhen Technology University was established in July 2017 and is one of the university’s earliest experimental teaching centers. It consists of sub-centers for transportation, vehicles, logistics, student innovation and entrepreneurship, and a racing studio. The center supports experimental teaching and innovation practices for transportation, logistics, and vehicle engineering majors. The total area is 11,820 square meters, housing 6,518 sets of instruments and equipment, with a total asset value of 229 million RMB.

Management is jointly handled by the university and the college. The university oversees asset and safety management, policy support, and funding, while the college is responsible for resource allocation, usage, and performance assessment. The Experimental Teaching Center manages daily laboratory operations, equipment maintenance, and safety, under the leadership of the center director.

(2) Management responsibilities

The Experimental Teaching Center implements a clear system of job responsibilities and accountability, guided by both university and college. Each laboratory is managed by

dedicated personnel. The center is the main body for laboratory safety, executing the college's Laboratory Technical Safety Committee's decisions and daily safety management. Specialists are appointed for laboratory infrastructure, asset, and safety management, ensuring smooth communication with university departments and key research platforms. Through scientific management and teamwork, the center continuously improves teaching quality and research standards.

(3) Safety management

Adhering to the principle of "safety first, prevention foremost, and comprehensive governance," the center has established long-term and standardized safety management documents (see Appendix 01-13 to Appendix 01-16). Each laboratory has designated responsible teachers and safety administrators, who must sign safety commitment letters (see Appendix 01-17). All new students are required to attend safety lectures and pass safety exams before entering laboratories; those who fail are not allowed entry. Regular safety inspections are conducted each semester, and any non-compliance is promptly reported and corrected.

(4) Equipment management

Equipment management is jointly overseen by the university and the college. The center director assigns daily maintenance and management to designated staff, and an asset management specialist coordinates inventory and documentation. Large and specialized equipment is managed by appointed personnel. The university has established specific equipment management regulations, such as the "Fixed Asset Management Measures for Instrument and Equipment" (see Appendix 01-9) and "Open Sharing Guidelines for Large-scale Scientific Research Instruments" (see Appendix 01-10). Routine maintenance is performed by laboratory custodians, while users are responsible for proper use and care during teaching periods. Specialized equipment undergoes regular maintenance, calibration, and precision checks. All asset information and user manuals are clearly recorded.

(5) Maintenance and loan of equipment

Borrowing of instruments and equipment is strictly controlled and must not interfere with teaching or research activities. Approval from relevant supervisors is required, and borrowers are held responsible for any damage. All borrowing and return transactions are logged. Upon return, custodians inspect equipment and update records. Maintenance issues must be reported within a week and repaired promptly, with detailed records kept. The center maintains a 98% operational rate for instruments, with annual update rates above 8% for electromechanical equipment, 10% for electronic instruments, and 20% for computers.

(6) Professional laboratories

The laboratory center follows high standards for space and infrastructure: each lab has a ceiling height of over 5 meters, and is equipped with Wi-Fi, air conditioning,

sprinkler systems, and access control. The center includes 67 laboratories: foundational labs, specialized labs, training labs, virtual simulation centers, and innovation workshops. Key facilities include the logistics and supply chain management technology center, new energy vehicle technology lab, racing testing lab, unmanned supermarket practice base, and SF Express smart logistics practice base. The experimental teaching system integrates "course experiments + innovative research practice + university-enterprise internship training," supporting over 60 experimental courses annually, with around 5,500 participants and a total workload of over 100,000 hours.

Within the Transportation Experimental Teaching Center, there are 12 specialized labs, such as the Guangdong Province University Rail Transit Smart Operation and Maintenance Engineering Technology Development Center, Rail Transit Driving Simulation Laboratory, Rail Transit Vehicle VR Laboratory, Traffic Safety and Behavior Analysis Laboratory, and Traffic Big Data Integration and Simulation Laboratory. These labs, covering about 4,000 square meters, primarily support foundational and advanced professional experiments in transportation and logistics.

3.3.6 Discipline research platforms

The College of Urban Transportation and Logistics has established five academic directions: Automotive Service Engineering (2018), Transportation (2018), Vehicle Engineering (2020), Logistics Management (2020), and Drone Technology (2024). Leveraging the master's programme in Transportation at Shenzhen University, the college is dedicated to cultivating practical, innovative, and interdisciplinary professionals with a strong sense of craftsmanship. The Transportation major is recognized as a distinctive programme in Guangdong Province, a model team for ideological and political education (2021), and a first-class undergraduate programme construction point (2022). The Automotive Service Engineering major is a national pilot for industry-education integration (Ministry of Industry and Information Technology, 2022).

The college places significant emphasis on building robust academic and research platforms, including university-enterprise joint laboratories. Key platforms established to date include:

(1) Guangdong Province University Rail Transit Smart Operation and Maintenance Engineering Technology Development Center

Focuses on smart transportation and integrated management for rail transit, covering 2,000 m^2 with equipment valued at 13.25 million RMB and a planned total investment of 37.8 million RMB. Collaborates with Shenzhen Metro, JiaoKong Technology, and SUTPC.

(2) Shenzhen Urban Rail Transit Key Laboratory

Conducts fundamental and applied research in urban rail transit, with a 1,000 m^2 laboratory area, 130 instruments (including 11 major instruments), valued at 13 million RMB.

(3) Guangdong Province University Intelligent Terminal Precision Component Engineering Technology Research Center

Specializes in new energy vehicles, intelligent connected vehicles, unmanned vehicles, and urban rail transit trains, supporting research on next-generation transport technology. Covers 400 m^2 with assets of approximately 3 million RMB.

(4) Drone Equipment and Technology Pilot Base

Approved under the 2022 Shenzhen High-Tech Zone Development Special Program, promoting innovation in drone technology and collaborating with 11 enterprises and research institutions.

The college has established more than 10 university-enterprise joint laboratories, such as:

- Shenzhen Technology University - Gaochuan Intelligent Control Joint Laboratory
- Kangsibai Smart IoT and Intelligent Connected Vehicle Joint Laboratory
- Shenzhen Institute of Metrology and Quality Inspection Collaborative Innovation Research Center
- 51WORLD Intelligent Vehicle Simulation Joint Laboratory
- Future Perception Digital Twin Technology Joint Laboratory
- Zhong'an Unmanned Systems and Intelligent Equipment Industry-Education Integration Collaborative Innovation Research Center (2023)
- Tianying Brothers Drone Intelligent Perception and Application Technology Collaborative Innovation Research Center (2023)

In total, the college operates over 60 research laboratories and more than 10 research institutes, providing strong support for faculty and student research activities.

Student Innovation and Competitions:

Students actively participate in a wide range of national and international competitions, including the Challenge Cup, National College Student Internet Plus Innovation and Entrepreneurship Competition, National College Student Renewable Energy Technology Competition, National College Student Engineering Training Comprehensive Ability Competition, National College Student Intelligent Vehicle Competition, National College Student Mechanical Innovation Competition, Robotics Competition, and the China University Student Formula Racing Competition. Over the past five years, students in the Transportation Programme have achieved outstanding results in these competitions (see Appendix 10-4 for details).

Industry Collaboration and Talent Development:

The college actively explores university-enterprise collaboration, integrating industry, academia, research, and application. To date, over 60 cooperation agreements have been

signed with leading enterprises such as Shenzhen Metro Group, SUTPC, JiaoKong Technology, BYD, Jingding Industrial Technology, Kangsibai Industrial, JD Logistics, and SF Technology. These partnerships promote the integration of education and research with industry, fostering innovative, application-oriented, and research-focused talents to meet the strategic development goals of Shenzhen and the Guangdong-Hong Kong-Macao Greater Bay Area.

Industry Colleges and Talent Training Models:

- In May 2021, the college jointly established and began operating the "Shenzhen Technology University Urban Rail Transit College" with Shenzhen Metro Group.
- In September 2019, it launched the "Jingding Class" in collaboration with Shenzhen Jingding Industrial Technology.
- The "Sensor Elite Class" was launched in 2022.
- In March 2023, the "Fengxue Modern Logistics and Supply Chain Industry College" was formally established with SF Express.

These platforms and collaborative models provide strong support for research, innovation, and the cultivation of high-level, application-oriented talents with both domestic and international competitiveness.

4. Transparency and Documentation

4.1 Module description

To ensure transparency and accessibility, all relevant module descriptions of the Transportation Programme are made publicly available on the official website of the College of Urban Transportation and Logistics at Shenzhen Technology University. The module descriptions include the module title, persons responsible for the module, teaching methods, credits and workload, intended learning outcomes, module content, admission and examination requirements, forms of examination and the calculation of module marks, recommended literature, and the date of the last amendment. These documents can be accessed at: https://utl.sztu.edu.cn/ASIIN/zpbg.htm.

4.2 Diploma and diploma supplement

Appendix 21-2 provides a sample of the graduation certificate and bachelor’s degree certificate for the Transportation Programme. All certificates are valid only when bearing the official seal of the University and the signature of the president. Appendix 21-3 presents a sample of the diploma supplement, while Appendix 06-1 provides a sample student transcript. All these documents are also published and regularly updated on the public page above (https://utl.sztu.edu.cn/ASIIN/zpbg.htm) for external reference.

4.3 Relevant rules

The rights and responsibilities of both the institution and students are clearly defined and made binding through official regulations (see Appendix 01 and Appendix 02). All essential rules and regulations related to the programme, including examination regulations and study guidelines, are made publicly available to ensure transparency for both internal and external stakeholders. These documents are accessible via the same public website (https://utl.sztu.edu.cn/ASIIN/zpbg.htm) and are also distributed to all freshmen in printed form.

4.4 Public access

In line with the ASIIN requirements for transparency, Shenzhen Technology University is committed to ensuring that all essential programme-related documents — including module descriptions, study and examination regulations, sample certificates, diploma supplements, and other relevant information — are made available to all stakeholders and the public via the following dedicated webpage: https://utl.sztu.edu.cn/ASIIN/zpbg.htm.

5. Quality Management: Quality Assessment and Development

To ensure teaching quality, we have developed a multi-level and networked Quality Assurance System (QAS) with clearly defined responsibilities, comprehensive evaluation frameworks, systematic data collection and analysis, and continuous improvement mechanisms. This system involves all relevant stakeholders and is designed to support ongoing enhancement of our teaching and learning processes.

5.1 Division of responsibilities

The quality assurance system involves multiple stakeholders, each fulfilling their respective roles. In terms of responsibility allocation, the university has established a networked organizational structure with clearly defined authority and responsibilities at every level. Specifically, at the university leadership and decision-making level, the Teaching Quality Assurance Leadership Group is responsible for approving major initiatives such as the construction of experimental and training bases and the co-establishment of industry-academy colleges. This group coordinates university-wide teaching resources, ensures funding prioritization for practical teaching, and oversees various teaching evaluation activities.

At the functional department level, the Department of Academic Affairs serves as the core operational and monitoring body for teaching. It is responsible for developing curriculum plans, managing teaching operations, conducting teaching quality assessments,

and clarifying the relationship between graduation requirements and the supporting course system. To effectively safeguard teaching quality, the university has established a dedicated Teaching Quality Supervision Office. This office manages the entire process of teaching supervision for both undergraduate and graduate programmes, maintains teaching order and standards, controls and enhances teaching quality, and supports the operations of the Undergraduate Teaching Supervision Group.

At the college level, academic units are the primary entities for quality assurance implementation. Colleges are responsible for executing university policies, conducting daily teaching quality monitoring (such as classroom observations, attendance checks, and teaching research activities), advancing programme and course development, and providing feedback on teaching issues. Meanwhile, the Student Affairs Department focuses on fostering an academic ethos centered on engineering ethics and the spirit of craftsmanship.

Instructors, as the main parties responsible for teaching quality, engage in self-reflection and improvement based on teaching evaluation outcomes. Students participate in quality assessment and feedback through course evaluations, seminars, and surveys. External stakeholders such as partner enterprises and employers provide feedback on societal needs and validate programme outcomes. Employers are involved in curriculum revisions, provide real-world engineering cases, serve as industry mentors, and evaluate graduates' engineering competencies. Industry experts participate in professional accreditation, programme assessment, and thesis supervision. Employers also assess graduate quality based on workplace performance, while graduates provide feedback on how their learning experience has impacted their career development.

5.2 Evaluation framework and indicators

The effective operation of the teaching quality assurance system relies on a scientific, comprehensive, and practical evaluation framework. The core framework currently in use is derived from the "Five Dimensions of Teaching Effectiveness," which include: the degree of assurance in faculty and resources, the effectiveness of quality assurance operations, the degree of achievement of educational objectives, the degree of alignment with societal needs, and the degree of satisfaction among students and employers. These dimensions serve as the primary basis for evaluation.

Teaching input indicators measure the "level of assurance for faculty and conditions," including metrics such as student-to-faculty ratio, proportion of faculty with senior professional titles, proportion of dual-qualified instructors, proportion of teaching funding allocation, and operational integrity rate of laboratory equipment.

Teaching process indicators primarily evaluate the "effectiveness of quality assurance operations," such as classroom teaching evaluations (Appendix 22-11: Shenzhen Technology University Classroom Teaching Evaluation Implementation Measures (Trial), Appendix 22-12: College Leadership Classroom Observation System

Implementation Measures, Appendix 22-5: Classroom Observation Evaluation Form), student attendance rates, and teaching supervisor classroom observation evaluations (Appendix 22-13: Teaching Supervisor Monthly Report).

Teaching output indicators assess the “achievement of educational objectives” and “alignment with societal needs.” These include graduation rates, degree conferral rates, pass rates for various examinations, graduate employment rates, postgraduate enrolment rates, outcomes of innovation and entrepreneurship projects, and awards in academic competitions.

Satisfaction and reputation indicators directly reflect “student and stakeholder satisfaction,” including current student satisfaction (course evaluations, Appendix 22-3), graduate satisfaction towards the university (Appendix 22-1), and comprehensive employer evaluations of graduates (Appendix 22-2).

5.3 Data collection and analysis

For data collection and analysis, we focus on both achievement calculation and formative assessment, with an emphasis on gathering direct evidence of student learning outcomes and conducting quantitative analyses. Primary data collection channels include course assessment materials, internship and practical training records, comprehensive graduation project (thesis) documentation, and targeted surveys.

Specifically, course assessment materials encompass not only final exams but also project reports, program code, experimental data, simulation results, and other forms of evidence. Internship and practical records consist of weekly internship logs, engineering journals, and corporate mentor evaluations. Comprehensive project documentation—archived from proposal reports and midterm reviews to final defenses—serves as the key medium for assessing integrated competencies. Targeted surveys mainly comprise graduate self-assessments of professional abilities (Appendix 22-1) and employer evaluations of graduate competencies (Appendix 22-2). The primary data analysis method employed is statistical analysis, involving basic descriptive statistics on collected data such as calculating average scores, pass rates, and grade distribution proportions.

5.4 Continuous improvement

To establish a closed-loop quality assurance system of “evaluation – feedback – improvement – re-evaluation,” responsible units at all levels have implemented comprehensive feedback mechanisms and improvement plans to drive continuous programme optimization. The Department of Academic Affairs publishes the Annual Report on Undergraduate Teaching Quality (Appendix 22-14), while the Teaching Quality Supervision Office communicates evaluation results (Appendix 22-13) to university leadership and decision-making bodies through channels such as teaching supervision bulletins. Colleges provide direct feedback to individual instructors by consolidating classroom observation evaluation forms.

At the same time, the university maintains robust systems for student teaching evaluation feedback and teaching bulletin information feedback, ensuring teaching personnel receive student input. Based on feedback at all levels, responsible units implement comprehensive improvements and optimizations to the teaching process. At the individual level, instructors refine course syllabi, adjust instructional design, and modify teaching methods based on supervisor and student feedback. At the programme and college level, colleges revise talent development plans, optimize curriculum systems, update teaching content, and incorporate new industry technologies and standards based on teaching evaluation results, employment data, and employer feedback. At the university level, adjustments are made to resource allocation (such as prioritizing support for high-performing programmes), management systems are refined, and quality assurance processes themselves are optimized based on the overall teaching quality status and resource investment efficiency analysis.