

Curriculum Standard

Curriculum: Building mechanics and structure

Major: Construction Engineering Technology

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Credit: 4.5

Class Hour: 88

Major: Construction Engineering Technology

1. Preface

1.1 Course nature

The course of "building mechanics and structure" is a professional compulsory course for engineering technology specialty, which plays a very important role in its professional quality composition.

1.2 Design ideas

The overall design idea of this curriculum standard: select the curriculum content according to the curriculum system based on the work process guidance and the needs of ability training; Change the knowledge standard into the ability standard, and set the goal of professional ability training based on the analysis of task and professional ability; Change the original form of classroom lectures, highlight the cultivation of innovation ability, create work situations, and cultivate students' basic ability to independently analyze and solve practical engineering problems in combination with the examination requirements of vocational qualification certificates.

The course standard is employment oriented. The teaching content of this course is determined according to the task and professional ability analysis of the job groups covered by the specialty by industry experts and in close combination with the assessment requirements of vocational qualification certificates. In order to fully reflect the idea of task leading and practice oriented curriculum, the teaching activities of this course should be divided into several projects, the teaching should be organized in the unit of projects, and the relevant professional theoretical knowledge should be introduced with typical cases as the carrier, so that students can deepen their understanding and Application of professional knowledge and skills in project practice, cultivate students' comprehensive professional ability and meet the needs of students' career development. This course is suggested to be $68 + 20 = 88$ class hours.

2. Course objectives

2.1 Overall objective

Through the teaching of this course, students can carry out mechanical analysis and calculation on the static structure of general engineering on the basis of solid basic mechanical knowledge, be familiar with the type and structural analysis of building structure, and master the design principle and calculation method of building structure. Through learning, cultivate students' ability to analyze and solve problems in practical work by independently and comprehensively using the basic theories, professional knowledge and basic skills learned; Lay a solid professional foundation for engaging in jobs in relevant industries after graduation, and improve students' comprehensive job selection ability and work ability.

2.2 Specific objectives

2.2.1 Knowledge objectives

Master the stress analysis of components; Master the internal force of any section by using the section method; Master the drawing method of component internal force diagram; Master the structural member design of single beam, slab and column; Master the structural design of one-way slab floor.

2.2.2 Capability objectives

Be able to analyze the stress of components; Can use the section method to calculate the internal force of any section; Drawing the internal force diagram of components; Be able to design the structure of single beam, slab and column; Can carry out the structural design of one-way slab floor.

2.2.3 Quality objectives

Self learning ability; Have good professional behavior; Have the ability of unity and cooperation; Develop a serious, responsible, rigorous and meticulous work style.

3. Course content and requirements

Serial Number	Tasks	Subject Introduction	Event Design	hour
1	Theoretical mechanics	(1) Knowledge content: ① Master the axioms of statics; ② Palm grip strength and couple, moment and couple moment; ③ Master the force analysis of objects; ④ The equilibrium equation of plane general force system; ⑤ Equilibrium equation of plane special force system. (2) Skill content: ① Have the ability of force analysis of objects; ② Ability to solve the equilibrium equation of plane general force system; ③ Ability to solve the equilibrium equation of plane special force system.	① Lecture ② Combination of teaching and practice ✓ ③ Case analysis ✓ ④ Discussion ✓ ⑤ Practical training	18
2	Mechanics of materials	(1) Knowledge content: ① Master the solution of internal force of tension and compression bar; ② Master the solution of the internal force of the beam; ③ Master stress and strength calculation; ④ Master the drawing of internal force diagram.	① Lecture ② Combination of teaching and practice ✓ ③ Case analysis ✓ ④ Discussion ✓	22

		(2) Skill content: ① Have the ability to solve the internal force of tension and compression rod; ② Have the ability to solve the internal force of the beam; ③ Ability to calculate stress and strength; ④ Ability to draw internal force diagram.	⑤ Practical training	
3	Building structure selection (I)	(1) Knowledge content: ① Master the overview of structural and mechanical properties of materials; ② Master the design value of load effect of structure; ③ Master the design of reinforced concrete beam; ④ Master the design of reinforced concrete slab; ⑤ Master the design of reinforced concrete columns. (2) Skill content: ① Have the ability to design reinforced concrete beams; ② Have the ability to design reinforced concrete slab; ③ Have the ability to design reinforced concrete columns.	① Lecture ② Combination of teaching and practice ✓ ③ Case analysis ✓ ④ Discussion ✓ ⑤ Practical training	18
4	Building structure selection (II)	(1) Knowledge content: ① Master the classification and characteristics of floor; ② Master the load calculation of one-way slab rib beam floor; ③ Master the internal force calculation of one-way slab rib beam floor; ④ Master the reinforcement calculation of one-way slab rib beam floor; ⑤ Master the structure of high-rise buildings. (2) Skill content: ① Have the ability to calculate the load of one-way slab rib beam floor; ② Have the ability to calculate the internal force of one-way slab rib beam floor; ③ Have the ability to calculate the reinforcement of one-way slab rib beam floor.	① Lecture ② Combination of teaching and practice ✓ ③ Case analysis ✓ ④ Discussion ✓ ⑤ Practical training	10
5	Practical training	Making of mechanical model (1) Knowledge content and requirements: ① Calculation of mechanical theory ② Making of mechanical model	① Lecture ② Combination of teaching and Practice ③ Case analysis	20

		(2) Skill content and requirements: Ability to make mechanical model	④ Discussion ✓ ⑤ Training ✓	
Total		68+20=88		

4. Implementation recommendations

4.1 Suggestions on textbook selection and compilation

(1) Textbooks must be compiled according to this curriculum standard, which should reflect the curriculum design idea of task leading and practice guiding.

(2) The professional activities of the specialty shall be divided into several typical work items, and the contents of teaching materials shall be organized according to the needs of completing the work items and the requirements of post operation procedures.

(3) The contents of textbooks should reflect the advanced nature, versatility and practicability. We should timely incorporate the new trends and achievements of this major into teaching materials, so that the teaching materials can be more close to the professional development and practical needs.

(4) The description of teaching materials must be concise, accurate and scientific. The activity design content of teaching materials should be specific and operable.

4.2 teaching suggestions

(1) In the teaching process, we should strengthen the cultivation of students' practical operation ability, adopt project teaching, improve students' learning interest and stimulate students' sense of achievement.

(2) In the teaching process of this course, teachers' case analysis and students' hands-on practice are combined to guide students to carry out the practice of tasks such as stress analysis of components, solution and calculation of bearing reaction, drawing of component internal force diagram, design of single component of beam, slab and column, design of floor, so that students can learn to deal with relevant problems encountered in project management in the process of project practice.

(3) In the process of teaching, we should create working situations, closely combine the requirements of professional quality training, and strengthen practical operation training. In the structural design training, improve students' post adaptability.

(4) In the teaching process, it is necessary to explain in combination with classic cases of engineering projects to help students understand.

(5) In the teaching process, we should pay attention to the latest technology and knowledge in the professional field and be close to the reality of engineering structure design. Provide students with space for career development and strive to cultivate students' innovative spirit and professional ability.

(6) In the teaching process, teachers should actively guide students to improve their professional quality and professional ethics.

4.3 teaching assessment and evaluation suggestions

(1) Reform the traditional means and methods of student evaluation, and adopt the evaluation mode of stage evaluation, target evaluation, project evaluation and the integration of theory and practice.

(2) Pay attention to the diversity of evaluation, and comprehensively evaluate students' scores in combination with classroom questions, students' homework, daily tests, skill competitions and

examinations.

(3) We should pay attention to the assessment of students' practical ability and the ability to analyze and solve problems in practice. We should give special encouragement to students with innovation in learning and application, and comprehensively evaluate students' ability.

4.4 Development and utilization of curriculum resources

(1) Pay attention to the development and utilization of curriculum resources and modern teaching resources, which are conducive to creating vivid working situations, stimulating students' interest in learning and promoting students' understanding and mastery of knowledge. At the same time, it is suggested to strengthen the development of curriculum resources, establish a database of multimedia curriculum resources, and strive to realize the sharing of Cross School multimedia resources.

(2) Actively develop and make use of network curriculum resources, and make full use of network information resources such as e-books, e-journals, databases, digital libraries, educational websites and electronic forums, so as to transform teaching from single media to multiple media. At the same time, we should actively create conditions to build a distance teaching platform and expand the interactive space of curriculum resources.

4.5 Suggestions on teaching conditions

Improve the allocation of small mechanical experiments and small structural models, as well as the construction of engineering case resource database.