

**THE UNIVERSITY OF DANANG  
UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**PROGRAM SPECIFICATION**

|                            |  |
|----------------------------|--|
| <b>MAJOR:</b>              | <b>CONSTRUCTION MATERIALS<br/>ENGINEERING AND<br/>TECHNOLOGY</b> |
| <b>CODE:</b>               | <b>7510105</b>   |
| <b>MODE OF STUDY:</b>      | <b>FULL-TIME</b>   |
| <b>MANAGEMENT FACULTY:</b> | <b>FACULTY OF ROAD AND<br/>BRIDGE ENGINEERING (FRBE)</b>         |

**Danang, 2020**

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## TRAINING PROGRAM

(Issued under Decision No. 1529/QĐ-ĐHKB July 3, 2020 of the Rector of university of Science and Technology-The university of Danang)

### A. GENERAL INFORMATION

|                                       |  |
|---------------------------------------|--|
| 1. Training program name (Vietnamese) | Công nghệ kỹ thuật vật liệu xây dựng   |
| 2. Training program name (English)    | Construction Materials Engineering and Technology (CMET)   |
| 3. Degree                             | Bachelor   |
| 4. Major code                         | 7510105  |
| 5. Learners or enrollment students    | Students who graduated from high school and satisfy admission conditions of university   |
| 6. Study duration                     | 4 years  |
| 7. Mode of study                      | Full time  |
| 8. Total of Credits                   | 130 credits (exclude Physical Education & National Defense Education)  |
| 9. Score scale                        | 4 - point scale  |
| 10. Graduation conditions             | Students who are graduated when they meet the following conditions:<br>1. Not being prosecuted for penal liability, not being disciplined at the level of academic suspension.<br>2. Accumulate enough number of courses and credits of the training program.<br>2. The cumulative GPA of the whole course is 2.00 or higher.<br>2. Have a certificate of Physical Education and National Defense Education.<br>3. Meet the required foreign language output standards (Note: depending on the training program, for example, for the CLC program, it requires level 4/6 according to the European framework or equivalent certificates) |

|  |   |
|--|---|
|  | 4. Having a certificate of basic information technology application.  |
| 11. Type of diploma                              | Bachelor's in construction Materials Engineering and Technology   |
| 12. Job positions/Opportunities                  | <p>Students who graduated with bachelor's degree in Construction Materials Engineering and Technology major are able to work in the following job positions:</p> <p>Specialized construction laboratories and laboratories in building material production units;</p> <p>Construction, management and quality control of materials for projects and construction works;</p> <p>Technology design for building material production units;</p> <p>Technical and managerial staff in building material production units.</p> |
| 13. Ability to study in higher education program | Students who graduate from this program can continue with an intensive training program to receive an Engineering degree or a master's program in the same or similar major.  |
| 14. Other training programs used for matching    | <p><i>Advanced program (bachelor's degree) Civil Engineering Bachelor of Science- Northen Arizona University.</i></p> <p><i>Advanced program (bachelor's degree)- Ho Chi Minh City University of Technology (HCMUT)- Major of Construction Materials Engineering and Technology.</i></p>  |

## **B. PHILOSOPHY OF EDUCATION, VISION, AND MISSION**

### **I. Philosophy of education**

“Thinking – Creating – Humanity Cherishing”

### **II. Vision**

By 2035, University of Science and Technology - The University of Danang will be a research university recognized by the international community, actively collaborating globally in solving socio-economic challenges in the country and the world.

### **III. Mission**

University of Science and Technology - The University of Danang is a higher education institution providing high-quality human resources with capable of innovation, creativity and entrepreneurship in the field of engineering - technology; implementing scientific research and technology transfer to serve the sustainable socio-economic development of the Central area and Highlands, domestically and internationally.

### **IV. Core values**

- Quality and professionalism
- Innovation and creativity
- Humanity and integrity

## **C. OBJECTIVES AND PROGRAM LEARNING OUTCOMES OF THE TRAINING PROGRAM**

### **I. Objectives**

#### ***1. General Objectives***

The general objectives of the training program in construction Materials Engineering and Technology are to train learners with political, ethical, knowledge, health; the ability to lifelong learning; the ability to be creative; have professional practice skills, research capacity, ability to effectively apply professional knowledge and advances in science and technology in construction materials engineering technology; have professional responsibility and sense of service to the community, meet development requirements in the field of technology and construction materials, serve the needs of socio-economic development, ensure national defense and security and international integration.

#### ***2. Program Objectives (POs)***

Students who graduated with bachelor's degree in Construction Materials Engineering and Technology major in University of Science and Technology - The University of Danang:

1. Have comprehensive professional knowledge; master the principles and rules of nature and society;
2. Have basic practical skills in construction materials engineering technology;
3. Have ability to work independently and creatively; capable of teamwork; capable of solving technical and technological problems in the field of construction materials engineering technology.

### **II. Program Learning outcomes (PLOs)**

Students graduated from bachelor-level training program in Construction Materials Engineering Technology major meet the requirements of 6-level output standards according to the Vietnam National Qualifications Framework :

1. Ability to apply knowledge of Mathematics, basic science, technology and engineering in analysis, design, construction, evaluation and research on problems in the field of construction materials engineering technology.
2. Having skills in practice, experiment, analysis, and basic data processing in construction materials engineering technology.
3. Having critical thinking, creative thinking, entrepreneurial thinking, professional behavior.
4. Having ethics and professional responsibility.
5. Ability to work in team/groups ; have effective communication skills.
6. Having skills in using foreign languages in their professional fields; have foreign language proficiency TOEIC 450 or equivalent.
7. Having basic skills in using Information Technology (IT) as prescribed in Circular No. 03/2014/TT-BTTTT and being able to use calculation tools in the field of construction materials.
8. Capable of forming ideas for design, construction, planning, participating in management and operation of technological lines in building material production units or construction projects suitable to the business, society and environment context.

### III. Mapping between POs and PLOs of the training program

| Program Objectives<br>(POs) | Program Learning Outcomes (PLOs) |   |   |   |   |   |   |   |
|-----------------------------|----------------------------------|---|---|---|---|---|---|---|
|                             | 1                                | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1                           | X                                | X |   |   |   |   |   | X |
| 2                           | X                                | X |   |   |   |   |   | X |
| 3                           | X                                |   | X | X | X | X | X |   |

## D. STRUCTURE AND MODULES

### I. Curriculum Structure

| Knowledge cluster                         | Total credits | Compulsive credits | Elective credits |
|---|---------------|--------------------|------------------|
| 1. Maths and Natural Sciences             | 30            | 30                 | 0                |
| 2. Core engineering fundamental knowledge | 30.5          | 30.5               | 0                |
| 3. Disciplinary knowledge                 | 25            | 21                 | 4                |
| 4. Project, internship, and thesis        | 18.5          | 12.5               | 6                |
| 5. General knowledge                      | 15            | 15                 | 0                |
| 6. Supportive knowledge                   | 11            | 9                  | 2                |
| <b>Total of credits</b>                   | <b>130</b>    | <b>118</b>         | <b>12</b>        |

**Note:** The above table does not include compulsory courses on National defense education and physical education.

## II. Knowledge cluster -classified Courses

| No        | Course name  | Credits | Courses    |                    |                | Semester | Remark |
|-----------|--|---------|------------|--------------------|----------------|----------|--------|
|           |  |         | Compulsory | Selected electives | Free electives |          |        |
| <b>A.</b> | <b>Maths and Natural Sciences (30 credits)</b>               |         |            |                    |                |          |        |
| 1         | Calculus 1   | 4       | x          |                    |                | 1        |        |
| 2         | General Chemistry  | 3       | x          |                    |                | 1        |        |
| 3         | Calculus 2   | 4       | x          |                    |                | 2        |        |
| 4         | Probability and Statistics                                   | 3       | x          |                    |                | 2        |        |
| 5         | Physics 1  | 3       | x          |                    |                | 2        |        |
| 6         | Experiment of Physics 1                                      | 1       | x          |                    |                | 2        |        |
| 7         | Physics 2  | 3       | x          |                    |                | 3        |        |
| 8         | Experiment of Physics 2                                      | 1       | x          |                    |                | 3        |        |
| 9         | Linear Algebra   | 3       | x          |                    |                | 3        |        |
| 10        | Applied Mathematics Engineering                              | 2       | x          |                    |                | 4        |        |
| 11        | Experimental Planning  | 3       | x          |                    |                | 6        |        |
| <b>B.</b> | <b>Core engineering fundamental knowledge (30.5 credits)</b> |         |            |                    |                |          |        |
| 1.        | Descriptive Geometry – Engineering Drawing                   | 3       | x          |                    |                | 1        |        |
| 2         | Thermal Engineering  | 2       | x          |                    |                | 3        |        |
| 3         | Engineering Mechanics  | 3       | x          |                    |                | 3        |        |
| 4         | Geodesy  | 3       | x          |                    |                | 3        |        |
| 5         | Structural Mechanics   | 3       | x          |                    |                | 4        |        |
| 6         | Construction Machines  | 2       | x          |                    |                | 4        |        |
| 7         | Engineering Geology  | 2.5     | x          |                    |                | 4        |        |
| 8         | Soil Mechanics   | 2.5     | x          |                    |                | 4        |        |
| 9         | Construction materials                                       | 2.5     | x          |                    |                | 4        |        |
| 10        | Ground and Foundation  | 2       | x          |                    |                | 5        |        |
| 11        | Reinforced Concrete Structures                               | 3       | x          |                    |                | 5        |        |
| 12        | Industrial Architecture                                      | 2       | x          |                    |                | 5        |        |
| <b>C.</b> | <b>Disciplinary knowledge (25 credits)</b>                   |         |            |                    |                |          |        |

| No        | Course name  | Credits | Courses    |                    |                | Semester | Remark                    |
|-----------|--|---------|------------|--------------------|----------------|----------|---------------------------|
|           |  |         | Compulsory | Selected electives | Free electives |          |                           |
| 1.        | Applied chemistry Engineering 1                                | 2       | x          |                    |                | 5        |                           |
| 2.        | Occupational safety in construction materials production       | 2       | x          |                    |                | 5        |                           |
| 3         | Thermal equipments in the production of construction materials | 2       | x          |                    |                | 6        |                           |
| 2         | Machinery for the production of construction materials         | 2       | x          |                    |                | 6        |                           |
| 4         | Production technique for Inorganic binder 1                    | 2       | x          |                    |                | 6        |                           |
| 5         | English for Construction Materials Engineering                 | 2       | x          |                    |                | 6        |                           |
| 6         | Technology of Building Ceramic 1                               | 2       | x          |                    |                | 7        |                           |
| 7         | Technology of Concrete 1                                       | 3       | x          |                    |                | 7        |                           |
| 8         | Construction Materials Testing & Inspections                   | 2       | x          |                    |                | 7        |                           |
| 9         | <i>Heat insulating and Heat resistant Materials</i>            | 4       |            | x                  |                | 7        | Choose 2 out of 3 courses |
| 10        | <i>Building Glass</i>  |         |            | x                  |                | 7        |                           |
| 11        | <i>Building Decorative and Complete Materials</i>              |         |            | x                  |                | 7        |                           |
| 12        | Construction Economics   | 2       | x          |                    |                | 7        |                           |
| <b>D.</b> | <b>Project, internship, and thesis (18.5 credits)</b>          |         |            |                    |                |          |                           |
| 1.        | PBL 1. Ground and Foundation                                   | 1       | x          |                    |                | 5        |                           |
| 2         | PBL 2. Reinforced Concrete Structures                          | 2       | x          |                    |                | 5        |                           |
| 3         | PBL 3. Production technique for Inorganic binder 1             | 1.5     | x          |                    |                | 6        |                           |
| 4         | PBL 4. Technology of Building Ceramic 1                        | 2       | x          |                    |                | 7        |                           |
| 5         | PBL 5. Technology of Concrete 1                                | 2       | x          |                    |                | 7        |                           |
| 6         | Worker Practice  | 1       | x          |                    |                | 5        |                           |



| No        | Course name   | Credits    | Courses    |                    |                | Semester | Remark                    |
|-----------|---|------------|------------|--------------------|----------------|----------|---------------------------|
|           |   |            | Compulsory | Selected electives | Free electives |          |                           |
| 7         | Construction materials fieldtrip                                  | 1          | x          |                    |                | 6        |                           |
| 8         | Graduation Internship   | 2          | x          |                    |                | 8        |                           |
| 9         | <i>Graduation Project - Binders</i>                               | 6          |            | x                  |                | 8        | Choose 1 out of 3 courses |
| 10        | <i>Graduation Project – Ceramics</i>                              |            |            | x                  |                | 8        |                           |
| 11        | <i>Graduation Project - Concrete</i>                              |            |            | x                  |                | 8        |                           |
| <b>E.</b> | <b>General knowledge (15 credits)</b>                             |            |            |                    |                |          |                           |
| 1         | Marxism Leninism's Philosophy                                     | 3          | x          |                    |                | 1        |                           |
| 2         | General Law   | 2          | x          |                    |                | 2        |                           |
| 4         | Political economics of Marxism Leninism                           | 2          | x          |                    |                | 3        |                           |
| 5         | History of Vietnamese Communist Party                             | 2          | x          |                    |                | 4        |                           |
| 6         | General Environment   | 2          | x          |                    |                | 4        |                           |
| 7         | Scientific socialism  | 2          | x          |                    |                | 5        |                           |
| 8         | Ho Chi Minh's ideology  | 2          | x          |                    |                | 6        |                           |
| <b>F.</b> | <b>Supportive knowledge (11 credits)</b>                          |            |            |                    |                |          |                           |
| 1         | Introduction to Construction Materials Engineering and Technology | 2          | x          |                    |                | 1        |                           |
| 2         | English A2.1  | 3          | x          |                    |                | 1        |                           |
| 3         | English A2.2  | 4          | x          |                    |                | 2        |                           |
| 4         | <i>Technology business Start-up</i>                               | 2          |            | x                  |                | 6        | Choose 1 out of 2 courses |
| 5         | <i>Economics for Business</i>                                     |            |            | x                  |                | 6        |                           |
| 6         | Physical Education  |            | x          |                    |                |          |                           |
| 7         | National Defense Education  |            | x          |                    |                |          |                           |
|           | <b>Total of credits</b>   | <b>130</b> |            |                    |                |          |                           |

(In the remark column, instructions on how to choose electives)

