**Materials Science and Engineering -A full time academic master of postgraduate training program as a First-level Discipline**

(for International Students in English teaching)

（Discipline code：0805 Grant: Master of Science）

**I. An Introduction to the Discipline**

Materials Science and Engineering Discipline in Shenyang Jianzhu University was established in 1951, formerly known as the major of silicate engineering. It is the only cultivation base featured with building materials for undergraduate and graduate student in Liaoning Province. Our discipline closely revolves around the characteristics of Architecture and Civil engineering of Shenyang Jianzhu University and carries out scientific research and talent cultivation in the field of material science and engineering, especially in the field of building materials. The Master's Program in Materials Science was started in 1998. In 2006, the Material Science and Engineering Discipline was approved firstly by Liaoning Province as a First-level discipline master’s degree authorization. Our Materials Science discipline is the key discipline of Ministry of Housing and Urban-Rural Development and Liaoning Province.

Materials Science and Engineering Discipline includes three secondary disciplines which are Material Physics and Chemistry, Materials Science and Materials Process Engineering in School of Materials Science and Engineering, with two doctoral related disciplines, one postdoctoral research station and one national teaching team. Among the full-time teachers, there are one member of the Inorganic Nonmetallic Materials Steering Committee of the Ministry of Education, one Distinguished Professor in Liaoning Province, one outstanding teacher in Liaoning Province, two people at 100-person level of Liaoning Hundred, Thousand and Ten Thousand Talent Project.

**II. Secondary Disciplines**

080501 Material Physics and Chemistry

080502 Materials Science

080503 Materials Process Engineering

**III. Cultivating Goals**

1. To master solid foundation theory, the system of specialized knowledge and the necessary experimental skills, be familiar with the trend of the development of the research in science and technology.

2. To obtain the innovation of scientific spirit, the ability to engage in scientific research or undertake a specialized technical work independently. To master a foreign language, be able to read specialized literature skillfully, and have the listening and speaking as well as written skills.

3. To get a healthy body and good psychological quality.

**IV. Research Fields**

1. Advanced and Prefabricated Civil Engineering Materials

* High performance cement-based composites in cold regions
* High performance prefabricated building materials
* Advanced road engineering materials

2. Key Materials and Technologies for Building Energy Efficiency

* Key materials for high building energy efficiency
* Integrated technologies for high building energy efficiency
* High performance thermal insulation material
* Energy storage building material

3. Recycling Solid Wastes as Building Materials

* Life cycle assessment of building materials
* Multi-material system establishment based on waste resources
* High performance building materials based on waste resources

4. Physical Chemistry of Material Surface

* Corrosion and protection of materials surface
* New energy materials based on photoelectric conversion
* Storage material for photoelectric information

**V. Duration of Schooling**

Duration of schooling for academic postgraduate student education is 2.5 years, the period of schooling is 2.5 ~ 4 years (including suspension). Course learning time usually lasts 1 year.

Excellent postgraduate in course study and thesis writing who are qualified in the examination can apply for graduation defense in advance; those postgraduate students who fail to get requested credits and complete the thesis, they may apply for deferment, but no more than 4 years.

About graduation defense in advance and graduation deferment, Please check out the two regulations for more details, which are *The Master’s degree thesis defense regulations in advance in Shenyang Jianzhu University* and *The postgraduate students* *graduation deferment regulations in Shenyang Jianzhu University*

**VI. Cultivating Mode**

1. The cultivation process of academic postgraduate students should be integrating theory with practice, which is to help postgraduate students to have an in-depth understanding about the basic theory and specialized knowledge in the discipline. What’s more, it should help postgraduate students to master the basic methods and skills in scientific research in order to foster their scientific research ability.

2. The overall responsibility for the supervisor of postgraduates is taken as a way of instruction mode, which advocates that the steering group headed by the supervisor instruct the students together with the supervisor as the first person in charge.

**VII. Curriculum and Credit Requirements**

1. The Curriculum (see the table below)

The Master's Degree of Material Science and Engineering implements the credit system. Postgraduate students should pass the course examination organized by the university, and only qualified students can get credits for the course. The courses could be divided into three categories: degree course, compulsory course and optional course.

2. Credit Requirements

The total credits required should be no less than 16 credits. Among them, the degree course no less than 8 credits, optional course no less than 7 credits.

**VIII.Thesis Work**

It should pay attention to cultivating the postgraduate student in the aspects of literature review, theoretical analysis and calculation, experimental operation, scientific research and innovation, and innovation ability to work independently. Specific requirements are as follows:

1. The Degree Thesis Writing

The duration of thesis writing is usually 1 ~ 1.5 years. The thesis should reflect the author research methodology, technology and achievement. The new methods and new technology in the thesis should be advanced and practical, which should have certain economic and social benefits. Thesis writing requires reliable information, correct theory, accurate data, clear argument and succinct expressions. The number of words in the main body of the thesis should be up to 10000 ~ 30000 words. The normalization of degree thesis conform to the requirements of *Regulations for Thesis Writing* (GB/T7713.1-2006) and *Work Regulations for Degree Thesis Writing of Shenyang Jianzhu University*.

2. Subject Selection and Opening

Under the guidance of supervisors, through literature review, investigation and participation in scientific research activities to decide on a certain research subject, the students should propose the thesis proposal to the discipline and the supporting institution, confirm the work plan, make clear the main contents, technical requirements, schedule and arrangement of the thesis. After the approval of the thesis proposal, the students can carry on the thesis work. Excellent thesis will be optional into “outstanding degree thesis data bank” according to the thesis proposal.

The thesis proposal in general will be arranged in the third semester.

3. The Mid-term Inspection

The mid-term inspection must be carried on during the period of master's degree thesis work. The mid-term inspection panel should be established and a degree thesis mid-term inspection meeting should be carried out to check the progress of the work of postgraduate student degree thesis. It is necessary to get the supervisor’s permission as well as the audit of school (department) if there are changes or adjustment in the process of thesis writing, and then it should be submitted to the postgraduate school for the record. Those students who do not take part in the thesis mid-term inspection for no reason can’t go to the next stage of thesis review and thesis defense. According to the result of the mid-term inspection, the best thesis will be optional to enter into the mid-term stage "outstanding thesis data bank".

The thesis mid-term inspection in general will be arranged in the fourth semester.

4．Academic achievement requirement

The requirements for academic achievements of postgraduate students in this discipline shall be implemented with reference to the *Work Regulations on Academic Achievements of Master's Students in Shenyang Jianzhu University*.

5. The Pre-Thesis Defense and Formal Thesis Defense

Postgraduate students may apply for the defense to the academic degree evaluation committee for defense with the required credits and completion of degree thesis as well as the completion of required courses learning and practice in the program. There must be a pre-defense advance must be before the formal thesis defense.

Postgraduate students can take part in the thesis defense after they must pass the thesis review, anonymous review and similarity detection, etc. Please check out *The Master’s degree thesis work regulations in Shenyang Jianzhu University* for the more detailed.The thesis pre-defense and defense in general will be arranged in January, March and June.

Materials Science and Engineering

(The Curriculum in English Teaching for Full-time International Postgraduate Student as [First Level Discipline](http://dict.cn/First%20Level%20Disciplines%20Authorized%20to%20Offer%20Doctorate%20Degree))

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| **Type of Course** | | **Course code** | **Course name** | **Credit hours** | **Credits** | **Term** | **Assessment** | **Note** |
| Degree Course | Basic Compulsory | 232011001 | Mathematical Statistics | 32 | 2 | 1 | Examination | Mandatory |
| Major Compulsory | 228111001 | Introduction to Materials Science and Engineering | 32 | 2 | 1 | 6~8 credits |
| 228111002 | Modern Testing Techniques for Materials | 32 | 2 | 2 |
| 228111003 | Structure and Properties of Inorganic Materials | 32 | 2 | 1 |
| 228111004 | Computational Materials Science | 32 | 2 | 2 |
| 228111005 | Composite Materials Science | 32 | 2 | 1 |
| 228111006 | Environment Conscious Material | 32 | 2 | 1 |
| Optional Course | Front Field | 228121001 | Progress of Materials Science | 16 | 1 | 1 | Evaluation | 7~9 credits |
| 228121002 | Advanced Concrete Science | 32 | 2 | 2 |
| 228121003 | Advanced Cementitious Materials | 16 | 1 | 1 |
| 228121004 | Concrete Admixtures Application | 16 | 1 | 2 |
| 22812105 | Advanced Functional Building Materials | 32 | 2 | 2 |
| 228121006 | Prefabricated Building Materials | 32 | 2 | 2 |
| 228121007 | Advanced Road Engineering Materials | 16 | 1 | 1 |
| 228121008 | Advanced Preparation Technology of Materials | 32 | 2 | 2 |
| 228121009 | Material Surface Engineering | 32 | 2 | 1 |
| 228121010 | Synthesis and Preparation of Materials | 32 | 2 | 1 |
| 228121011 | Thin Film Material and Technology | 32 | 2 | 2 |
| 228121012 | Structure and Properties of Polymers | 32 | 2 | 2 |
| Compulsory Mode | | 228141002 | Academic communication | at least 10 times | 1 | 1~4 |  |