

# **Education Plan for Academic Graduate in Materials Science and Engineering**

**(Discipline Code:0805,Award Master Degree of Engineering)**

## **I Objectives**

The major is targeted to train the master candidates skilled in a variety of research、teaching and engineering technology and management of Material Science and Engineering, and High level talents with innovative spirit. As proposed, this program would require the postgraduate students to be able to:

1.Abide the law, form a good character, behave honestly and trustworthy, strictly and cooperately, and maintain good research ethics and professionalism.

2.Be skilled in the basic theory、basic experiment skill and systematic professional knowledge of one's own field, know the dynamics of cutting-edge professional disciplines. Master a foreign language, can skillfully read professional literature and write papers. Skilled in computer application technology. Have engaged in scientific research, teaching and can take an independent technical work. Have a strong sense of engineering and stronger managing and developing consciousness and market concept.

3.Actively participate in physical exercise, Maintain a good physical and mental health quality.

## **II Disciplinary Research Areas**

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| 1.Ecological building materials          | 5.Environmental materials                  |
| 2.Advanced composite materials           | 6.Biomedical materials                     |
| 3.New energy materials and devices       | 7.New technology of material forming       |
| 4.Novel functional materials and devices | 8.The application of computer in materials |

## **III Educational System and Years of Study**

The educational system for a full-time academic graduate is three years and the study period lasts generally three years, no more than five years. Total credits for academic graduate should be greater than or equal to 27 credits, among which the courses credits should be greater than or equal to 22 credits (Public degree courses credits should be greater than or equal to 11 credits, Professional Degree Course credits should be greater than or equal to 6 credits, Elective credits should be greater than or equal to 5 credits ), Compulsory courses is 5 credits.

## **IV Curriculum System and Credit Requirements**

Course Category	Course No.	Course Name	Hour	Credit	Semester	School	Remark
Public Course	003281001	First Foreign Language(Chinese)	108	6	1 2	School of International Education	Compulsory
	003281002	Introduction to China	54	3	1	School of International Education	
	01421061	Methods of Mathematical Physics	36	2	1	School of science	Any 2 Courses
	01421062	Matrix Theory	36	2	1		
	01421063	Applied Mathematical Statistics	36	2	1		
	01421064	Stochastic Processes	36	2	2		
	01421065	Numerical Computation	36	2	2		
	01421066	Mathematic Model	36	2	2		
	01421067	Mathematical modeling and Simulation	45	2.5	1	School of science	Required by Recommended Students
Specialized Course	00121001	Progress in Materials Science	36	2	2	School of Material	
	00121002	Contemporary Analytical Techniques for Materials Characterization	54	3	2		
	00121003	Solid State Physics	54	3	1		
	00121004	Ecologically Beneficial Material	36	2	1		
	00121005	Microscopic Theory of Materials Strengthening	36	2	1		

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	00121006	Principle and Computer Simulation of Metal Solidification	36	2	2		
	00121007	Introduction of Phase Transformation	36	2	1		
	00121008	Polymer Structures and Properties	36	2	1		
	00121009	Principles of Polymerization	36	2	1		
	00121010	Polymer Processing Principle and Technology	36	2	2		
	00121011	The Mechanical Property of Composite Materials	36	2	1		
	00121012	The Interface of the Composite Material and Design	36	2	1		
	00121013	Introduction to Biomedical Engineering	36	2	1		
	00121014	Biomedical Materials	36	2	2		
	00121015	Thin Film Materials and Devices	36	2	2		
	00121016	Advanced Synthesis and Processing Technology of Materials	36	2	1		
	00121017	Computational Material Science	36	2	1		
	00121018	Material Forming Theory and Technique	36	2	1		

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	00121019	Theory and Technology of Material Processing	36	2	1		
	00121020	Semiconductor Physics	36	2	2		
	00121021	Material Statistical Thermodynamic	36	2	2		
	00121022	Dynamics in Materials	36	2	1		
	00121023	Spectroscopy and Spectroscopic Techniques for Materials Analysis	36	2	1		
	00121024	Spectroscopy and Spectroscopic Techniques for Materials Analysis	36	2	1		
Optional Course	00122001	Security in Laboratory	18	1	1	School of Material	Compulsory
	00122002	Writing and Specification of Research Paper	18	1	2		
	00122003	English for Materials Science and Engineering	18	1	2		
	00122004	Destruction Principle of Concrete Materials	36	2	2	School of Material	Optional
	00122005	Glass and Amorphous Materials	36	2	2		
	00122006	New Type of Functional Materials for Architectures	36	2	2		
	00122007	Cementitious Material Science	36	2	2		

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	00122008	Advanced Ceramic Materials	36	2	2		
	00122009	Construction Polymer Materials	36	2	2		
	00122010	Pavement and Bridge Construction Materials	36	2	2		
	00122011	Surface Engineering Science	36	2	2		
	00122012	Materials Welding and Joining Techniques	36	2	2		
	00122013	Metallic Functional Materials	36	2	2		
	00122014	Metal Matrix Composites	36	2	2		
	00122015	Morphology of Polymer	36	2	2		
	00122016	Polymer Process Engineering	36	2	2		
	00122017	Emulsion Polymerization	36	2	2		
	00122018	Polymer Surface and Interface	36	2	2		
	00122019	Polymer Materials with Special Functionality	36	2	2		
	00122020	Resin Matrix Composites	36	2	2		
	00122021	The Development of Composites Process	36	2	2		
	00122022	High Performance Polymer Matrix	36	2	2		

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	00122023	Composite Materials Design	36	2	2		
	00122024	High Performance Enhancement Materials	36	2	2		
	00122025	Bioceramics	36	2	2		
	00122026	Science and Technology of Nano-sized Materials	36	2	2		
	00122027	Ceramic-matrix Composites	36	2	2		
	00122028	Surface and Interface of Material	36	2	2		
	00122029	Micromechanics of Materials	36	2	2		
	00122030	Material Processing with Computer Aided Design Technology	36	2	2		
	00122031	CAD/CAE Polymer Forming CAD/CAE	36	2	2		
	00122032	Material Molding Numerical Stimulation and Optimization	36	2	2		
	00122033	The Principle of Powder Metallurgy	36	2	2		
	00122034	The Engineering Analysis of Forming for Sheet Metals	36	2	2		
	00122035	Modern Mold Materials and Design	36	2	2		
	00122036	Principles and Techniques of High Energy Rate Forming	36	2	2		

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	00122037	Detection and Control of Material Processing	36	2	2		
	00122038	Precision Forming Technology	36	2	2		
	00122039	Semi-Solid Manufacturing Theories and Technology	36	2	2		
	00122040	Functional Thin Film Materials	36	2	2		
	00122041	Forming Technology of Advanced Ceramics	36	2	2		
	00122042	Optoelectronics and Photonics Technology	36	2	2		
	00122043	Foundations of Semiconductor Optoelectronics	36	2	2		
	00122044	Optoelectronic Materials and Devices	36	2	2		
	00122045	New Energy Materials and Techniques	36	2	2		
	00122046	Microstructure and Properties of Materials	36	2	2		
	00122047	Electrochemical Powersources	36	2	2		
	00122048	Catalytic Chemistry and Catalytic Materials	36	2	2		
	00122049	Electrochemical Fundamentals	36	2	2		
	00122050	Materials Micro-fabrication-Principle and Technology	36	2	2		

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	00122051	Thermal Analytical Technology for Material	36	2	2		
	00122052	Electron Microscopy of Materials	36	2	2		
	00122053	Photoelectron Spectroscopy for Materials Surface & Interface	36	2	2		
	00122054	Crystal Structure Analysis of Materials with X-ray Diffraction Method	36	2	2		
	00122055	Silicate Reaction Engineering	36	2	2		
	00122056	Ultrafine Powder and Processing Technology	36	2	2		
	00122057	Rheology of Materials	36	2	2		
	00122058	Surface or Grain Boundary of Materials	36	2	2		
	00122059	Dielectric Physics	36	2	2		
	00122060	Magnetic Materials	36	2	2		
	00122061	Evaluation Technology for Semiconductor	36	2	2		
	00122062	Semiconduct Ceramics and Devices	36	2	2		
	00122063	Crystalline Materials	36	2	2		
	00122064	Experiments of Materials Research	36	2	2		



Course Category	Course No.	Course Name	Hour	Credit	Semester	School	Remark
		and Testing Methods					
	00122065	Living Materials	36	2	2		
	00122066	Fiber Optic Chemical Sensor and Biosensor	36	2	2		
	00122067	Fiber Optics	36	2	2		
Interdisciplinary elective course	02223001	Taijiquan and its	18	1	1	Department of Physical Education	
Other courses in biomedical materials and engineering courses can be selected for the training program course for Biomedical Engineering							
Compulsory Courses	00124004	Practice of SMSE		3		School of Material	
	00124002	topics and interim assessment of SMSE		1			
	00124003	academic activities of SMSE		1			

Note: Optionally 1-2 elective course credits within the school.