ENGLISH COURSES LIST

For International Students

SEPTEMBER 1, 2020

DALIAN UNIVERSITY OF TECHNOLOGY
No.2 Linggong Road, 116024 Dalian, China

CATALOG

CHEMICAL ENGINEERING

1. INTRODUCTION

Chemical engineering is an applied science. Chemical Engineers use science and mathematics, especially chemistry, physics, applied mathematics and engineering principles, to take laboratory or conceptual ideas and turn them into value added products in a cost effective and safe (including environmental) manner. Chemical Engineers work in research, design, production, simulation, optimization, technical sales and management of various chemical processes. They are responsible for the basic necessities in life that many of us take for granted.

To prepare for the kinds of diverse career options, one needs a solid foundation in engineering and chemistry, as well as the freedom to take specialized courses in areas of interest. This is provided in Chemical Engineering Curriculum of Dalian University of Technology by having a core of common technical courses and then program electives tailored to the career objectives for each individual student.

The program in chemical engineering begins with an English training and foundation in mathematics, general chemistry, and physics. These fundamentals are used to develop the analytical tools of chemical engineering. Courses as organic chemistry, physical chemistry and biological chemistry are in the sophomore year. Core courses such as chemical thermodynamics, transport, separation, process design, integration and control are in junior and senior years. The program electives explore both depth and breadth areas including chemical process principles, products and process design, catalytic chemical process, fundamentals of membrane separation, introduction to fine chemicals, energetic chemical engineering. This program will prepare you for professional practice in a wide range of chemical engineering. The independent works and practical trainings in this program provide students with the vital experience of design chemical processes and innovation ability.

Because of the Chemical Engineer's unique background, Chemical Engineering is one of the broadest fields in the science-technical area. This program offers a wide variety of career options, especially in the combination of English and chemical engineering areas.

2. COURSE SYSTEM

Course No.	Course Name	Credits		Course No.	Course Name	Credits
1150020010	MILITARY THEORY	0.5		1010241601	PHYSICAL CHEM LAB I	1.0
1150020020	MILITARY TRAINING	3.0		1010241611	PHYSICAL CHEM LAB II	1.0
1130020011	PE（I）	1.0		1010430041	BIOCHEMISTRY	2.0
1130020021	PE（II）	1.0		1010430051	BIOCHEMISTRY LAB	0.5
1130020031	PE（II）	1.0		1010130011	INTRODUCTION TO	2.0
1100022010	ENGLISH LISTENING B1	2.0		1010130027	MOMENTUM AND HEAT	3.0
1100022050	ENGLISH LISTENING AND	2.0		1010130028	MASS TRANSPORT AND	3.0
1100022030	CRITICAL READING AND	2.0		1010141031	TRANSPORT	3.0
1100022040	INTRODUCTION TO CHINESE	2.0		1010130033/	UNIT OPERATION LAB	1.5
1100022070	WESTERN PHILOSOPHICAL	2.0		1010141011	CHEME	3.0
1100022080	PUBLIC SPEAKING AND	2.0		1010141021	CHEMICAL REACTION	3.0
1100022090	GRAND STRATEGIES	2.0		1010141052	PROCESS DESIGN AND	2.0
1120020090	CALCULUS I	4.0		1020531001	CHEMICAL PROCESS	2.0
1120020100	CALCULUS II	5.0		1010141061	CHEMICAL PROCESS	2.0
1120020190	CALCULUS III	3.0		1010530071	FUNDAMENTALS OF	3.0
1120020200	DIFFERENTIAL EQUATIONS	4.0		1010241200	PHYSICAL CHEM I	3.0
1110020060	GENERAL PHYSICS I	3.0		1010241210	PHYSICAL CHEM II	2.5
1110020071	GENERAL PHYSICS **II**	3.0		1010141331	CHEMICAL	2.0
1110020040	GENERAL PHYSICS LAB 1	1.0		1010140033	INDEPENDENT WORK I	2.0
1110020050	GENERAL PHYSICS LAB 2	1.0		1010140034	INDEPENDENT WORK II	2.0
1020820040	COMPUTING FOR	3.0		1010140042	INDEPENDENT WORK III	3.0
1050130111	ENGINEERING GRAPHICS &	3.0		1010140051	SENIOR THESIS	12.0
1020130050	CIRCUITS&ELECTRONICS	2.0		1050161530	ENGINEERING	2.0
1020920050	INSTRUMENT &	0.5		1010140011	PRACTICAL TRAINING I	1.0
1010231080	INORGANIC CHEMISTRY I	3.0		1010140021	PRACTICAL TRAINING	3.0
1010231111	INORGANIC CHEM LAB I	0.5		1010141133	SEPARATION	2.0
1010231121	INORGANIC CHEM LAB II	1.0		1010141131	CHEMICAL PROCESS	3.0
1010231090	INORGANIC CHEMISTRY II	1.5		1010141134	PRODUCTS AND	2.0
1010241010	ANALYTICAL CHEMISTRY	2.0		1010141177	ENGINEERING	2.0

Course No.	Course Name	Credits		Course No.	Course Name	Credits
1010241550	ANALYTICAL CHEM LAB	1.5		1010141121	MEMBRANE	2.0
1010241100	ORGANIC CHEMISTRY I	3.0		1010141351	ENERGETIC CHEMICAL	2.0
1010241110	ORGANIC CHEMISTRY II	1.5		1010130061	INTRODUCTION TO	2.0
1010241571	ORGANIC CHEM LAB	1.5				

APPLIED CHEMISTRY

1. INTRODUCTION

This major training is based on social development and national modernization construction needed in the 21st century, aimed at cultivating comprehensive development of moral quality, broad knowledge and international vision. Furthermore, this major intends to cultivate innovative and competitive modern international senior elite talents, as well as the students who plan to study for a higher degree in relevant fields.

Requirements

Understand the basic theory and knowledge of chemistry and applied chemistry. Mastery of necessary basic knowledge of engineering, the preliminary ability for research, development and design of the advanced chemicals product, technology and equipment.

Fluent English communication skills in speaking and writing. Good interpersonal skills, coordination skills and teamwork spirit.

2. COURSE SYSTEM

Course Name	Introduction to Chemistry
	General Chemistry
	Introductory Inorganic Chemistry
	Introductory Organic Chemistry
	Introductory Physical Chemistry
	Spectroscopy Theory and Practice
	Organic Chemistry
	Practical Chemistry and Key Skills A
	Principle of Chemical Engineering and Practical I
	Inorganic Chemistry
	Physical Chemistry
	Practical Chemistry and Key Skills B
	Principle of Chemical Engineering and Practical II

	Advanced Organic Chemistry
	Advanced Inorganic Chemistry
	Advanced Physical Chemistry
	Advanced Analytical Chemistry
	Polymer Chemistry and Physics
	Metals in Synthesis
	Computational Chemistry

MATHEMATICAL SCIENCE

1. INTRODUCTION

Mathematical science aims to cultivate students to gain professional knowledge of interdisciplinary fields, financial mathematics, data science or computational science. The graduates will be prepared for either interdisciplinary research in academia or industry positions in finance, electrical engineering or information science as a developer or a technical manager.

Requirements

Ø Solid foundation of mathematics, rigorous training in mathematical thinking, potential of further study and research on mathematical science.

Ø Sound theory of physics, experimental skills, and physics culture.

Ø Strong computer skills including common computer languages, tools and mathematical software, as well as powerful capabilities of software development.

Ø Professional knowledge and skills in the financial mathematics, data science and computational science, as well as the ability of analyzing and processing data, of building mathematical models and solving practical problems.

Ø Techniques to search materials and retrieve knowledge by contemporary information technology.

The students are expected to be fluent in English speaking, listening, writing and communication, competent in work that requires a complete English environment.

2. COURSE SYSTEM

Course Name	Intro to Computing and Programming
	Introduction to mathematical sciences
	Analytic Geometry
	Calculus & Analysis-1
	Probability

	Linear Algebra-1
	Algorithm, Data Structures and Advanced Programming
	Calculus & Analysis-2
	Mathematics in Business
	Introductory Statistics
	Linear Algebra-2
	Vector Calculus
	Introduction to Computing
	Advanced Linear Algebra
	Mathematical Foundation of AI and Machine Learning
	Markov processes
	Linear Statistics
	Algebra
	Differential Equations
	Operations Research
	Data Mining and Neural Networks
	Scientific Computing
	Equations of Mathematical Physics
	Complex Analysis
	Financial Maths

PROCESS EQUIPMENT AND CONTROL ENGINEERING

1. INTRODUCTION

This major aim to train students with basic theories of mechanics, engineering and control for equipment design, manufacture, operation, maintenance and administration through basic and major courses studies. Students can be engaged in R&D, design, teaching or management after completing the required courses.

Requirements

Ø Understand natural sciences such as mathematics, physics and general knowledge on engineering technology. Have a basic understanding on R&D of process equipment and be able to solve practical problems encountered in process engineering.

Ø Understand relevant laws and regulations on process equipment and control engineering.

Ø Ability to analyze technological economy and have basic knowledge on enterprise management.

The students are expected to be fluent in English speaking, listening, writing and communication, competent in work that requires a complete English environment.

2. COURSE SYSTEM

Course Name	Mechanical Engineering Foundation (chemistry part)
	Electrical & Electronic Engineering
	Mechanical Engineering
	Engineering mathematics ii
	Materials processing
	Materials and structures
	System dynamics and control
	Dynamics and thermofluids
	Integrated engineering design
	Applied engineering thermodynamics

	State variable control
	Aero material structure (option, pick 1)
	Fe analysis and design (option, pick 1)
	R&S dynamics (option, pick 1)
	Heat transfer and energy
	Comprehensive process and equipment design
	Engineering management
	Digital control and actuators

CIVIL ENGINEERING

1. INTRODUCTION

This program intends to train highly-qualified interdisciplinary civil engineering professional elite talents who meet the needs of international civil engineering construction, have a solid basic theories and professional knowledge, and have strong engineering practice ability and innovative thinking. This program plans to train senior technical personnel who are working in the field of civil engineering as the planning, design, construction, management, education and scientific research, etc. This program also aims to train international leaders and the industry's technical experts who committed to the sustainable development of civil engineering.

Requirements

Students should master the basic theory and knowledge of civil engineering disciplines, with which they should be able to analyze and solve complex engineering problems using mathematics, mechanics and other basic theory. Meanwhile, they should accept experimental skills and engineering practice training, have the engineering practice ability of planning, design, construction and management a project, have modern technology information retrieval capabilities, as well as the ability to engage scientific researches in civil engineering and related fields. What’s more, they should have further study and lifelong learning ability.

Students should have a wide-range international vision and foreign language communication skills.

2. COURSE SYSTEM

Course Name	Credits
Computational and Data Science I	2
Computational and Data Science II	2
Civil engineering graphics	2
Introduction to civil engineering	2
Theoretical mechanics	3
Mechanics of materials	4

Fluid mechanics	2
Engineering geology	2
Surveying	2
Civil engineering materials	2.5
Structural mechanics	3.5
Soil mechanics	3
Matrix Analysis of Structures	2
Elasticity & finite element programming	2.5
Reingorced concrete structures i	3
Steel structures i	3
Construction of Civil Engineering	2
Foundation engineering	2
Seismic design of building structures	2
Structural design of high-rise buildings	2
Structural experiments	2
Structural concepts & systems	2
Advanced topics on structural mechanics	2
Principles and applications of building information modeling	2
International engineering contract	2
Engineering project investment and financing	2
Timber and masonry structures	2
Engineering software and their applications	2
Reingorced concrete structures ii	2
Steel structures ii	2
Fundamentals of structural dynamics	2
Reliability of structures	2
Curriculum design of civil engineering graphics	1
Surveying practice	1.5
Curriculum design of rc structures	1.5
Curriculum design of steel structures	1.5
Curriculum design of foundation engineering	1
CURRICULUM DESIGN OF Construction of Civil Engineering	1

APPLIED PHYSICS

1. INTRODUCTION

This specialty is aimed to train students to be Hi-Tech elites with solid physics basis and good ability for solving engineering-based problems. Graduates, who have high comprehensive quality and strong innovation capability, are able to engage in applied research, technology development, teaching and management work, to be the socialist cause builders and successors who are developed in an all-round way morally, intellectually and physically.

(1) Solid foundation of physics, rigorous training in physical thinking and experimental skills, potential of further study and research on physics;
(2) Sound theory of mathematics and mathematics culture;
(3) Strong computer skills including common computer languages, tools and some mathematical software, powerful capabilities of software development.
(4) Professional knowledge and skills in applied physics and nuclear physics, as well as the ability of analyzing and processing data, of building physical models and solving practical problems.
(5) Techniques to search materials and retrieve knowledge by contemporary information technology.
(6) Finish 173.5 Chinese credits (equal of 240 Belarusian credits), and the elective courses should be more than 9 credits.

Requirements

Skills of presentation and communication in English include speaking, listening, reading and writing; competence in complete English environment. Master Russian preliminary, have the ability to learn and communicate in Russian in related majors.

(1) International vision and skills in cross-cultural communication/cooperation.
(2) Adaptively to the quick pace of modern life, and passion for lifelong study and innovation.

2. COURSE SYSTEM

Course Name	Credits
Engineering Drawing	2
Engineering drawing Practice	1

Mechanics	2.5
Electromagnetic	3.5
Thermal Physics / Molecular Physics	2
Fundamental Physics Lab Experiments 1	1.5
Fundamental Physics Lab Experiments 2	1.5
Electrical and Electronic Technology	3
Electrotechnics Experiments A1	1
Electrotechnics Experiments A2	0.5
Electronic Technology Experiment	3
Methods of mathematics physics 1	2
Methods of mathematics physics 2	3
Optics	3.5
Theoretical Mechanics	3
Differential Equations	3
Physics of Atom and Atomic Effects	3
Quantum Mechanics B	4
Fundamentals of Metrology and Standardized Statistics	2
Electrodynamics B	3
Thermodynamics and Statistical Physics B	4
Computer Modeling	2
Modern Physics Lab Experiments 1	2
Modern Physics Lab Experiments 2	2
Physical Material Science	2
Laser Physics	3
Computational Physics	3.5
Fundamentals of Electronic States and Processes in	2
Applied Physics Lab Experiments	3.5
Optoelectronics	2
Modern Laser Systems and Their Application	3.5
Plasmonics and metamaterials	2
Modern Solid-State Physics	2

Optical Fiber Communications	2
Radiation effects in solids	2
Modern Methods of Materials Study	2
Optics of polymers and liquid crystals	2
Nonlinear optics	2
Basics of Solid-State Electronics	2
General Introduction in Solid State Lighting	3

ENGINEERING MECHANICS

1. INTRODUCTION

The Major of Engineering Mechanics trains students with solid foundation of theoretical knowledge of engineering mechanics, modern computational technique, and experimental ability, and with the ability to be a senior science and technique or engineering talent. The graduates will be capable for either the interdisciplinary research in academia or the positions in industry such as aerospace and mechanical engineering as a developer or a technical manager, to be the socialist cause builders and successors who are developed in an all-round way morally, intellectually and physically.

Requirements

(1) Solid basic knowledge of natural science, relatively good basic knowledge of humanities, arts, and social sciences, relatively strong language and writing skills.
Solid basic knowledge of solid mechanics, fluid mechanics, computational mechanics and experimental mechanics, having specific study method, mode and logic for this major.

(2) Strong computer skills including common computer languages, tools and some engineering computation software, good at writing programming codes.
Techniques to search materials and retrieve knowledge by contemporary information technology.

(3) Finish 172.5 Chinese credits (equal of 240 Belarusian credits), and the elective courses should be more than 7 credits.

Requirements

Skills of presentation and communication in English include speaking, listening, reading and writing; competence in complete English environment. Master Russian preliminary, have the ability to learn and communicate in Russian in related majors.

(1) International vision and skills in cross-cultural communication/cooperation.

(2) Adaptively to the quick pace of modern life, and passion for lifelong study and innovation.

2. COURSE SYSTEM

Course Name	Credits
Engineering Drawing	2
Engineering drawing Practice	1
College Physics 1	3.5
College Physics 2	3
College Physics Experiment 1	1
College Physics Experiment 2	1
Theoretical Mechanics- Statics and Kinematics	2
Theoretical Mechanics-Dynamics	3
Introduction to the Development of Modern Mechanics	2
Elementary mechanics experiment	1
Fundamental of Numerical Method	2
Differential Equations	3
Methods of mathematics physics	4
Mechanical Design Basis	3
Basic Engineering Practice of Mechanical Design	1
Mechanics of Materials	4
Computer aided mechanical design	2
Mechanics of Vibration	3
Solid Mechanics Experiment A	1.5
Solid Mechanics Experiment B	2
Elasticity	4
Structural Mechanics	3
Fluid Mechanics	4
Hydrodynamics Experiment	0.5
Plate and Shell Mechanics	3
Computational Structural Mechanics	2
Continuum Mechanics	2.5
Scientific and engineering computing software	2
Plasticity	3

Mathematical methods of solid mechanics	3
Finite Element	2
Thermodynamics	2
Reinforced Concrete Structure	2
Fracture and Damage Mechanics	2
Field Learning (Training) of Engineering Structures	2

MECHANICAL DESIGN & MANUFACTURING AND THEIR AUTOMATION

1. INTRODUCTION

The undergraduate program combines mechanical engineering with computer technology, automation, sensing test and other technologies to cultivate students with basic knowledge of mechanical engineering, marketing, economy, and industrial management. By emphasizing both analytical and creative methods, the Joint Program cultivates students' broad skills they need to pursue their goals, the international vision and skills in cross-cultural communication, competition and cooperation and the adaptivity to the quick pace of modern life, and passion for lifelong study and innovation.

Requirements

Ø Broad background in the fundamentals of Mechanical Engineering as well as offering an introduction to many professional and technical areas with which mechanical engineers are concerned.

Ø Sound theory of mathematics and mathematics culture.

Ø Strong computer skills including common computer languages, tools and some mathematical software, powerful capabilities of software development.

Ø Basic ability of mechanical product design, manufacturing and equipment control, and production management.

Ø Techniques to search materials and retrieve knowledge by contemporary information technology. Ability to perform scientific research.

Skills of presentation and communication in English and Chinese include speaking, listening, reading and writing. Capable of studying, working and living in complete English environment.

2. COURSE SYSTEM

Course Name	Credits
MATH 2A SINGLE-VARIABLE CALCULUS	4
ENGRMAE 10 INTRODUCTION TO ENGINEERING COMPUTAIONS	4
CHEM 1A GENERAL CHEMISTRY	4
AC ENG 22A ACADEMIC ENGLISH READING AND VOCABULARY	4
MATH 2B SINGLE-VARIABLE CALCULUS	4
PHYSICS 7C CLASSICAL PHYSICS	4
PHYSICS 7LC CLASSICAL PHYSICS LABORATORY	1
CHEM 1LE ACCELERATED GENERAL CHEMISTRY LAB	3
ENGR 7A* INTRODUCTION TO ENGINEERING I	2
WRITING 39B CRITICAL WRITING	4
MATH 2D MULTIVARIABLE CALCULUS	4
PHYSICS 7D CLASSICAL PHYSICS	4
PHYSICS 7LD CLASSICAL PHYSICS LABORATORY	1
ENGR 7B* INTRODUCTION TO ENGINEERING II	2
WRITING 39C ARGUMENT AND RESEARCH	4
MATH 3A INTRODUCTION TO LINEAR ALGEBRA	4
PHYSICS 7E CLASSICAL PHYSICS	4
PHYSICS 52AFUNDAMENTALS OF EXPERIMENTAL PHYSICS	2
EMAE 30 STATICS	4
BASIC SCIENCE COMPUTER	4
MATH 3D ELEMENTARY DIFFERENTIAL EQUATIONS	4
ENGR 54 PRINCIPLES OF MATERIALS SCIENCE AND ENGINEERING	4
EMAE 60 ELECTRIC CIRCUITS	4
EMAE 80 DYNAMICS	4
ECON 23/ 20A BASIC ECONOMICS (FUNDAMENTALS OF MICROECONOMICS)	4
MATH 2E MULTIVARIABLE CALCULUS	4

ENGRMAE 52 COMPUTER AIDED DESIGN	4
EMAE 91 INTRODUCTION TO THERMODYNAMICS	4
EMAE 115 APPLIED ENGINEERING THERMODYNAMICS	4
EMAE 130A INTRODUCTION TO FLUID MECHANICS	4
EMAE 150 MECHANICS OF STRUCTURES	4
EMAE 150L MECHANICS OF STRUCTURES LABORATORY	1
EMAE 130B INTRODUCTION TO VISCOUS AND COMPRESSIBLE FLOWS	4
EMAE 147 VIBRATIONS	4
EMAE 156 MECHANICAL BEHAVIOR AND DESIGN PRINCIPLES	4
ENGR 190W COMMUNICATION IN THE PROFESSIONAL WORLD	4
EMAE 106 MECHANICAL SYSTEMS LABORATORY	4
EMAE 120 HEAT AND MASS TRANSFER	4
EMAE 145 THEORY OF MACHINES AND MECHANISMS	4
EMAE 107 FLUID THERMAL SCIENCE LABORATORY	4
EMAE 170 INTRODUCTION TO CONTROL SYSTEMS	4
EMAE 151 MECHANICAL ENGINEERING DESIGN	4

INFORMATION SCIENCE & ENGINEERING

1. INTRODUCTION

International School of Information Science & Engineering, Dalian University of Technology and Ritsumeikan University (DUT－RU ISE) was founded in March 2013.It is one of the secondary schools of Dalian University of Technology (DUT) approved by the State Ministry of Education. DUT-RU ISE is the first Sino-Japan cooperatively-run school at undergraduate higher education level. It is a model for the collaboration between famous universities of China and Japan. DUT-RU ISE initiated the cooperative operation on education of academic diploma level between China and Japan.

Adopting the “4+0” and “2+2” cultivation mode, DUT-RU ISE is recruiting undergraduates for software engineering direction (Sino-Japan joint operation) and will expand recruitments to internet of things engineering direction (Sino-Japan joint operation) and digital media direction (Sino-Japan joint operation) in the future. All major courses are bilingual classes taught either in Japanese or English, among which half of the core courses are taught by either Japanese teachers from Ritsumeikan University or excellent Chinese teachers with overseas education background and PhD diploma. Japanese and English classes are designed as small-class teaching in order to guarantee the quality. DUT-RU ISE also set up the “two-tutor system” mode of graduation design with its unique feature based on the “tutorial system” mode of graduation design introduced from Ritsumeikan University (ranked 1st in the Japanese University comprehensive evaluation index).

2. COURSE SYSTEM

Course Name	Credits
Basic programming c	3
Data structure and algorithm	2
Science and technology and ethics	2
Operating system	2
Computer vision	2