



FACULTY OF ENGINEERING KHON KAEN UNIVERSITY

Program	General Education Course (Credit)	Area of Concentration Course (Credit)	Free Elective Course (Credit)	Total (Credit)
Civil Engineering (CE)	30	111	6 – 9	147
Electrical Engineering (EE)		107		143
Agricultural Engineering (AE)		118		148
Industrial Engineering (IE)		105		141
Mechanical Engineering (ME)		110		146
Environmental Engineering (Envi)		109		145
Chemical Engineering (ChE)		110		146
Computer Engineering (CoE)		104		140
Electronic Systems Engineering (ESE)		105		141
Telecommunications Engineering (International Program)		108		144
Logistics Engineering (International Program)		105		144
Chemical Engineering (International Program)		110		146
Digital Media Engineering (International Program)		107		143



General Education Course (30 Credits) for Bachelor Degree Programs

- **Foreign Languages Course (12 credits):**

English I English II English III English IV

- **Humanities and Social Sciences Course (12 credits):**

Leadership and Management

Learning Skill Development

Multiculturalism (CE/AE/IE/ME/Envi/ChE/CoE) or Local Wisdom (EE/ESE)

Work Preparation and Continuing Self-Development

Basic Computer and Information Technology (non credit, all programs except CoE)

- **Mathematics and Science Course (6 credits):**

Creative Thinking and Problem Solving

Entrepreneurial Spirit Incubation

General Education Course (30 Credits) for International Programs

- **Communications Skill Courses (12 credits):**

English for Communication in Multicultural Societies

Academic English

Critical Reading and Writing

Thai for Foreigners I or Japanese for Communication I or Chinese for Communication

- **Self and Social Responsibility, Moral and Ethics Courses (6 credits):**

Aesthetics for Life

Wellness Dimension

- **Morality, Ethics and Self and Social Responsibility Courses (6 credits):**

Multiculturalism

Globalization Studies

- **Critical Thinking and Research Skill Courses (6 credits):**

Research Applications for Problem Solving

Information Literacy

- **Computer and Information Technology Skill Courses (3 credits):**

Basic Computer and Information Technology (non credit)

Free Elective Course (6 – 9 Credits)

Choose subjects that open in Khon Kaen University at least 6 credits but not exceed 9 credits

Civil Engineering



General Education Course (30 Credits)

- **Foreign Languages Course (12 credits):**

English I English II English III English IV

- **Humanities and Social Sciences Course (12 credits):**

Leadership and Management Multiculturalism
Learning Skill Development
Work Preparation and Continuing Self-Development
Basic Computer and Information Technology (non credit)

- **Mathematics and Science Course (6 credits):**

Creative Thinking and Problem Solving Entrepreneurial Spirit Incubation

Area of Concentration Course (111 Credits)

- **Basic Course (34 credits):**

Statics	Engineering Workshop Practice
Engineering Drawing	Computer Programming
General Chemistry	General Chemistry Laboratory
Calculus for Engineering I	Calculus for Engineering II
Calculus for Engineering III	Differential Equations for Engineering
Fundamentals of Physics I	Fundamentals of Physics II
General Physics Laboratory I	General Physics Laboratory II

- **Core Course (68 or 71 credits)**

- **Basic Profession course for Civil Engineering (17 credits):**

Engineering Materials	Field Survey
Strength of Materials I	Strength of Materials II
Fluid Mechanics	Fluid Mechanics Laboratory
Surveying	Surveying Laboratory

- **Practical Training and Cooperative Education** (1 or 6 credits):

choose one of these subjects; Practical Training (1 credit, non credit) or Cooperative Education in Civil Engineering (6 credits)

- **Prescribed Elective Course:** select these subjects at least 6 credits (2 subjects) for student who choose Cooperative Education in Civil Engineering and at least 9 credits (3 subjects) for student who choose Practical Training:

Construction Engineering

Advanced Concrete Technology

Urban Transportation Planning

Groundwater Engineering

Construction Planning and Scheduling

Soil Improvement

Earth Structures

Advanced Steel Structures Design

Building Design

Structural Dynamics

Roadway Design by Application Software

Pavement Design

Open Channel Hydraulics

Computer Applications in Civil Engineering

Applied Statistics for Civil Engineers

Introduction to Railway System Engineering

Rolling Stock Engineering

Railway System Planning and Administration

Rail Track Design

Railway Electrification

Introduction to Geographic Information Systems

Construction Contract and Related Law Management

Introduction to Soil Dynamics

Map Projection

Traffic Engineering

Construction Productivity Management

Engineering Management

Pile Foundation

Advanced Structural Analysis

Pretressed Concrete Design

Concrete Bridge Design

Transport Logistics Management Systems

Geometric Highway Design

Asphalt Technology

Tribology in Rail Way System Engineering

Train Operation and Control

Special Topics in Civil Engineering

Photogrammetry

Railway Signaling and Control

Railway Project Management

Introduction to Railway Maintenance

Railway Traction Systems

Rail Propulsion System



Electrical Engineering



Area of Concentration Course (107 Credits)

• Basic Course (37 credits):

Statics
Engineering Drawing
General Chemistry
Calculus for Engineering I
Calculus for Engineering III
Fundamentals of Physics I
General Physics Laboratory I
Engineering Materials

Engineering Workshop Practice
Computer Programming
General Chemistry Laboratory
Calculus for Engineering II
Differential Equations for Engineering
Fundamentals of Physics II
General Physics Laboratory II

• Core Course (64 or 67 credits)

• Basic Profession course for Electrical Engineering (33 credits):

Electric Circuits
Electromagnetic Fields
Electrical Engineering Laboratory I
Electrical Engineering Laboratory III
Control Systems
Application of Probability and Random Process
Elementary Signal Transform Theory and Linear Algebra

Electrical Instruments and Measurements
Computational Methods
Electrical Engineering Laboratory II
Analogue Electronics I
Digital Signal Processing
Digital Logic Design

• Profession course for Electrical Engineering (28 or 31 credits):

Electrical Machines I
Electric Power Systems
Power Electronics
High Voltage Engineering
Electric Power Engineering Laboratory
Electrical Engineering Pre-project (for student who choose Practical Training)
Electrical Engineering Project (for student who choose Practical Training)

Electrical Machines II
Electric Power System Analysis
Renewable Energy
Electrical System Design
Electric Motor Drives

- **Practical Training and Cooperative Education** (1 or 6 credits): choose one of these subjects; Practical Training (1 credit, non credit) or Cooperative Education in Electrical Engineering (6 credits)
- **Prescribed Elective Course:** select these subjects at least 3 credits (1 subject) for student who choose Cooperative Education in Electrical Engineering and at least 6 credits (2 subjects) for student who choose Practical Training:

Programmable Logic Controller

Linear Control Systems

Intelligent Systems

Power Quality

Illumination Engineering

Protection and Relay

Semiconductor Devices

Data Storage Technology

Engineering Economy

Fundamentals of Electrical Engineering

Fundamentals of Electrical Engineering Laboratory (1 credit)

Electrical Energy Conservation and Management

Introduction to Thermodynamics and Fluid Mechanics

Photovoltaic system and wind generator control and operation

High Current and High Voltage Engineering Laboratory (1 credit)

Introduction to Robotics

Digital Control Systems

Mechatronics

Automation System Engineering

Power Plants and Substations

Special Topics in Electrical Engineering

Sensors and Transducers

Magnetism Magnetic Materials and Devices

Introduction to Railway System Engineering



Agricultural Engineering



Area of Concentration Course (118 Credits)

• Basic Course (34 credits):

Statics
Engineering Drawing
General Chemistry
Calculus for Engineering I
Calculus for Engineering III
Fundamentals of Physics I
General Physics Laboratory I

Engineering Workshop Practice
Computer Programming
General Chemistry Laboratory
Calculus for Engineering II
Differential Equations for Engineering
Fundamentals of Physics II
General Physics Laboratory II

• Core Course (72 or 75 credits)

• Basic Profession course for Agricultural Engineering (38 credits):

Engineering Materials
Agricultural Engineering Laboratory I
Agricultural Building Structures
Principles of Irrigation and Drainage
Manufacturing Processes
Mechanics of Materials
Fundamentals of Fluid Mechanics
Analysis and Assessment in Farm and Postharvest System

Fundamentals of Electrical Engineering
Agricultural Engineering Laboratory II
Agricultural Hydrology
Agricultural Process Engineering
Dynamics
Thermodynamics I

• Profession course for Agricultural Engineering (31 or 34 credits):

Agricultural Machinery
Agricultural Tractor Engineering
Power for Agricultural System
Freezing and Cold Storage
Mechanical Vibration
Computer-aided Design in Agricultural Engineering
Agricultural Engineering Pre-project (for student who choose Practical Training)
Agricultural Engineering Project (for student who choose Practical Training)

Theory of Agricultural Machines
Agricultural Machinery Design I
Fluid Power System and Control
Agricultural Engineering Seminar
Heat Transfer

- **Practical Training and Cooperative Education** (1 or 6 credits): choose one of these subjects;
Practical Training (1 credit, non credit) or Cooperative Education in Agricultural Engineering (6 credits)

- **Prescribed Elective Course:** select these subjects at least 3 credits (1 subject) for student who choose Cooperative Education in Agricultural Engineering and at least 6 credits (2 subjects) for student who choose Practical Training:

Livestock and crop Production Engineering
 Soil and Water Conservation Engineering
 Fan, Pump and Compressor
 Cane Sugar Manufacturing Technology
 Engineering Properties of Agricultural Products
 Renewable Energy Technology for Agriculture
 Agricultural Environmental Management
 Agricultural Building Design
 Groundwater Resources for Agriculture
 Remote Sensing in Hydrology
 Water Resources Engineering and Management
 Flood and Drought Management
 Agricultural Machinery Design II
 Agricultural Machinery Testing and Evaluation
 Material Handling
 Rolling Stock Engineering
 Introduction to Railway System Engineering
 Railway System Planning and Administration
 Rail Track Design
 Railway Electrification
 Rail Propulsion System
 Industrial Management
 Safety Engineering
 Engineering Management
 Internal Combustion Engine
 Automatic Control
 Fluid Machinery
 Power Plant Engineering
 Industrial Piping System Design
 Neural Network Application in Agricultural Engineering
 Image Processing Application in Agricultural Engineering
 Soft Computing and Simulation in Water Resources Engineering
 Geographic Information System in Water Resource Engineering

Agricultural Soil Engineering
 Open Channel Flow and Floodplain Analysis
 Sugarcane Production Engineering
 Rice Postharvest Technology
 Food Process Design
 Smart Farm
 Agricultural Project Feasibility Study
 Principles of Water Management
 Meteorology
 Hydraulic Structure
 River Engineering
 Integrated Water Resources Management
 Harvesting Machines
 Agricultural Mechanization
 Special Topics in Agricultural Engineering
 Tribology in Rail Way System Engineering
 Railway Signaling and Control
 Railway Project Management
 Introduction to Railway Maintenance
 Railway Traction Systems
 Train Operation and Control
 Maintenance Engineering
 Engineering Economy
 Thermodynamics II
 Refrigeration and Air Conditioning
 Automotive Engineering
 Robotic Engineering
 Principles of Energy Conservation
 Biomass Conversion Technology



Industrial Engineering



Area of Concentration Course (105 Credits)

• **Basic Course** (34 credits):

Statics
Engineering Drawing
General Chemistry
Calculus for Engineering I
Calculus for Engineering III
Fundamentals of Physics I
General Physics Laboratory I

Engineering Workshop Practice
Computer Programming
General Chemistry Laboratory
Calculus for Engineering II
Differential Equations for Engineering
Fundamentals of Physics II
General Physics Laboratory II

• **Core Course** (65 or 68 credits)

• **Basic Profession course for Industrial Engineering** (16 credits):

Engineering Materials
Manufacturing Processes
Fundamentals of Electrical Engineering
Fundamentals of Electrical Engineering Laboratory

Engineering Statistics
Thermodynamics I

• **Profession course for Industrial Engineering** (46 or 49 credits):

Mechanical and Materials Engineering Laboratory
Industrial Work Study and Productivity Improvement
Manufacturing Engineering Laboratory
Maintenance Engineering
Industrial Plant Design and Facilities Planning
Industrial Engineering Pre-Project (for student who choose Practical Training)
Industrial Engineering Project (for student who choose Practical Training)

Industrial Engineering Laboratory
Engineering Economy
Quality Control
Production Planning and Control
Safety Engineering

*** only for Industrial Engineering major: Industrial Management, Operations Research, Computer Application in Industry, Industrial Cost Analysis and Budgeting, Computer Simulation Technique, Design of Engineering Experiments, Project Feasibility Study, and Industrial Seminar and Teamwork Practice

*** only for Manufacturing and Materials Engineering major: Physical and Mechanical Metallurgy, Automatic Control System, CAD/CAM/CAE for Industrial Engineers, Forming Process, Industrial Automation and Process Optimal Control, Machine Tools, Tools Engineering, and Manufacturing Engineering Seminar

- **Practical Training and Cooperative Education** (1 or 6 credits): choose one of these subjects; Practical Training (1 credit, non credit) or Cooperative Education (6 credits)

- **Prescribed Elective Course:** select these subjects at least 3 credits (1 subject) for student who choose Cooperative Education and at least 6 credits (2 subjects) for student who choose Practical Training:

Engineering Management

Decision Analysis

Value Engineering

Ergonomics

Welding Technology

Corrosion of Metals and Alloys

Tribology

Special Topics in Industrial Engineering

Logistics

Introduction to Railway System Engineering

Rolling Stock Engineering

Railway System Planning and Administration

Rail Track Design

Railway Electrification

Rail Propulsion System

Transport Logistics Management Systems

Rice Postharvest Technology

Alternative and Renewable Energy Resources

Introduction to Quality Engineering and Management

Introduction to Micro- and Nano- Electronics Manufacturing

Basic Optimization Technique

Marketing for Engineers

Production Systems and Inventory Control

Foundry Technology

Tools and Die Design

Heat Treatment of Metals and Alloys

Biomaterials

Special Topics in Manufacturing Engineering

Agricultural Logistics Management

Tribology in Rail Way System Engineering

Railway Signaling and Control

Railway Project Management

Introduction to Railway Maintenance

Railway Traction Systems

Train Operation and Control

Cane Sugar Manufacturing Technology

Principles of Energy Conservation



Mechanical Engineering



Area of Concentration Course (110 Credits)

- **Basic Course** (34 credits):

Statics
Engineering Drawing
General Chemistry
Calculus for Engineering I
Calculus for Engineering III
Fundamentals of Physics I
General Physics Laboratory I

Engineering Workshop Practice
Computer Programming
General Chemistry Laboratory
Calculus for Engineering II
Differential Equations for Engineering
Fundamentals of Physics II
General Physics Laboratory II

- **Core Course** (64 or 67 credits)

- **Basic Profession course for Mechanical Engineering** (31 credits):

Engineering Materials
Manufacturing Processes
Dynamics
Thermodynamics I
Fundamentals of Fluid Mechanics
Mechanical Engineering Experiment I

Fundamentals of Electrical Engineering
Design of Engineering Experiments
Mechanics of Materials
Thermodynamics II
Engineering Design Process
Mechanical Engineering Experiment II

- **Profession course for Mechanical Engineering** (30 or 33 credits):

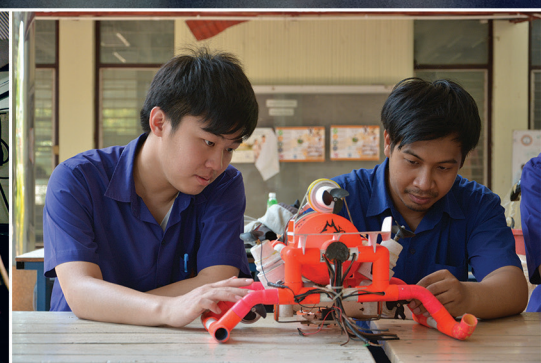
Mechanics of Machinery
Mechanical Vibration
Refrigeration and Air Conditioning
Machine Design I

Internal Combustion Engine
Heat Transfer
Automatic Control
Machine Design II

Computer Aided Design of Mechanical System
Power Plant Engineering
Mechanical Engineering Pre-Project (for student who choose Practical Training)
Mechanical Engineering Project (for student who choose Practical Training)

- **Practical Training and Cooperative Education** (1 or 6 credits): choose one of these subjects; Practical Training (1 credit, non credit) or Cooperative Education in Mechanical Engineering (6 credits)
- **Prescribed Elective Course:** select these subjects at least 9 credits (3 subjects) for student who choose Cooperative Education in Mechanical Engineering and at least 12 credits (4 subjects) for student who choose Practical Training:

Safety Management	Introduction to Engineering Failure Analysis
Industrial Piping System Design	Fundamentals of Fire Protection Engineering
Automotive Engineering	Fracture Mechanics and Fatigue
Combustion	Fluid Power System
Fluid Machinery	Robotic Engineering
Mechanical Engineering Measurement	Principles of Energy Conservation
Boiler and Gas Turbine	Solar Energy Engineering
Introduction to CAD/CAM/CAE	Introduction to Engineering Optimization
Introduction to Railway System Engineering	Tribology in Railway System Engineering
Rolling Stock Engineering	Railway Signaling and Control
Railway System Planning and Administration	Railway Project Management
Rail Track Design	Introduction to Railway Maintenance
Railway Electrification	Railway Traction Systems
Rail Propulsion System	Train Operation and Control
Maintenance Engineering	Noise Pollution and Vibration Control
Introduction to Artificial Neural Network Systems	Alternative and Renewable Energy Resources
Finite Element Method in Mechanical Engineering	
Computer-Aided Drafting in Mechanical Engineers	



Environmental Engineering



Area of Concentration Course (109 Credits)

• **Basic Course** (34 credits):

Statics
Engineering Drawing
General Chemistry
Calculus for Engineering I
Calculus for Engineering III
Fundamentals of Physics I
General Physics Laboratory I

Engineering Workshop Practice
Computer Programming
General Chemistry Laboratory
Calculus for Engineering II
Differential Equations for Engineering
Fundamentals of Physics II
General Physics Laboratory II

• **Core Course** (66 or 69 credits)

• **Basic Profession course for Environmental Engineering** (30 credits):

Engineering Materials
Fluid Mechanics
Engineering Economy
Chemistry for Environmental Engineers
Environmental Unit Operations
Chemistry Laboratory for Environmental Engineers
Biology Laboratory for Environmental Engineers

Strength of Materials I
Fluid Mechanics Laboratory
Design of Engineering Experiments
Biology for Environmental Engineers
Environmental Unit Processes

• **Profession course for Environmental Engineering** (33 or 36 credits):

Surveying
Water Supply Engineering and Design
Environmental Health and Safety Engineering
Air Pollution Control and Design
Building Sanitation and Design
Environmental Engineering Pre-project (for student who choose Practical Training)
Environmental Engineering Project (for student who choose Practical Training)

Surveying Laboratory
Solid Waste Management and Technology
Wastewater Engineering and Design
Environmental Impact Assessment
Hazardous Waste Management

- **Practical Training and Cooperative Education** (1 or 6 credits): choose one of these subjects; Practical Training (1 credit, non credit) or Cooperative Education in Environmental Engineering (6 credits)
- **Prescribed Elective Course:** select these subjects at least 6 credits (2 subjects) for student who choose Cooperative Education in Environmental Engineering and at least 9 credits (3 subjects) for student who choose Practical Training:

Industrial Pollution Prevention

Water Quality Management

Industrial Water Pollution and Control

Noise Pollution and Vibration Control

Biotechnology for Environmental Engineering

Selected Topics in Environmental Engineering

Soil Mechanics

Groundwater Engineering

Earth Structures

Thermodynamics I

Manufacturing Processes

Civil Engineering Materials and Testing

Civil Engineering Materials Laboratory (1 credit)

Reinforced Concrete Design & Practice (4 credits)

Computer Application in Environmental Engineering

Production Process of Industries for Environmental Engineering

Environmental Systems and Management

Advanced Wastewater Technology

Air Quality Management

Environment and Energy

Engineering Geology

Structural Theory

Soil Mechanics Laboratory (1 credit)

Construction Management

Fundamentals of Electrical Engineering

Thermodynamics II

Hydrology



Chemical Engineering



Area of Concentration Course (110 Credits)

• **Basic Course** (34 credits):

Statics
Engineering Drawing
General Chemistry
Calculus for Engineering I
Calculus for Engineering III
Fundamentals of Physics I
General Physics Laboratory I

Engineering Workshop Practice
Computer Programming
General Chemistry Laboratory
Calculus for Engineering II
Differential Equations for Engineering
Fundamentals of Physics II
General Physics Laboratory II

• **Core Course** (67 or 70 credits)

• **Basic Profession course for Chemical Engineering** (20 credits):

Engineering Materials
Material and Energy Balances
Basic Organic Chemistry
Physical Chemistry
Analytical Chemistry Laboratory for Chemical Engineers

Design of Engineering Experiments
Chemical Process Instrumentation
Basic Organic Chemistry Laboratory

• **Profession course for Chemical Engineering** (44 or 47 credits):

Chemical Engineering Thermodynamics
Unit Operations for Momentum Transfer
Heat and Mass Transfer
Unit Operations for Mass Transfer
Mass Transfer Laboratory
Safety Management in Chemical Industry
Chemical Kinetics and Reactor Design
Process Cost Estimation
Chemical Plant Design

Momentum Transfer
Momentum Transfer Laboratory
Unit Operations for Heat Transfer
Heat Transfer Laboratory
Process Modeling and Simulation
Process Dynamics and Control
Seminar in Chemical Engineering
Chemical Industrial Processes

Chemical Engineering Pre-Project (for student who choose Practical Training)

Chemical Engineering Project (for student who choose Practical Training)

- **Practical Training and Cooperative Education** (1 or 6 credits):

choose one of these subjects; Practical Training (1 credit, non credit) or Cooperative Education in Chemical Engineering (6 credits)

- **Prescribed Elective Course:** select these subjects at least 6 credits (2 subjects) for student who choose Cooperative Education in Chemical Engineering and at least 9 credits (3 subjects) for student who choose Practical Training:

Chemistry for Chemical Engineers

Computer Applications in Chemical

Polymer Technology

Composite and Product Design

Petroleum Technology

Alternative fuels and renewable energy technologies

Special Topics in Chemical Engineering

Environmental Chemical Engineering

Air Pollution Control in Chemical Plant

Industrial Work Study and Productivity Improvement

Engineering Management

Introduction to Process Design for Petroleum Industries

Electrochemical Technology for Chemical Engineering

Separation Technology

Engineering Introduction to Catalysis

Corrosion Technology

Introduction to Encapsulation

Biomass Conversion Technology

Industrial Management

Basic Biochemical Engineering

Manufacturing Processes

Operations Research

Quality Control

Value Engineering



Computer Engineering



Area of Concentration Course (104 Credits)

• Basic Course (41 credits):

Engineering Workshop Practice
Analogue Electronics I
Discrete Mathematics and Linear algebra
Computer Engineering Workshop practice
Calculus for Engineering I
Calculus for Engineering III
Fundamentals of Physics I
General Physics Laboratory I
Theory of Computation

• Core Course (42 or 45 credits)

Advanced Computer Programming
Fundamentals of Computer Programming
Software Engineering
Operating Systems
Computer Networks
Digital Logic Design
Microprocessors and Interfacing
Computer Architecture
Principles of Digital Communication and Modeling
Principles of Digital Communications and Modeling Laboratory
Computer Engineering Pre-Project (for student who choose Practical Training)
Computer Engineering Project (for student who choose Practical Training)

Engineering Drawing
Linear Circuit Analysis
Analogue Electronics Laboratory
Stochastic Processes and Modeling
Calculus for Engineering II
Differential Equations for Engineering
Fundamentals of Physics II
General Physics Laboratory II

Advanced Computer Programming Laboratory
Database Systems
Data Structures and Algorithms
Circuits Signals and Systems
Computer Networks Laboratory
Digital Logic Design Laboratory
Microprocessors and Interfacing Laboratory
Seminar in Computer Engineering

- **Practical Training and Cooperative Education** (1 or 6 credits): choose one of these subjects; Practical Training (1 credit, non credit) or Cooperative Education in Computer Engineering (6 credits)

- **Prescribed Elective Course:** select these subjects at least 18 credits (6 subjects) for student who choose Cooperative Education in Computer Engineering and at least 15 credits (5 subjects) or student who choose Practical Training:

Assembly Programming
Digital Image Processing
Game Theory and Engineering Applications
Advanced Digital System Design with VHDL
Applied Digital Design
CMOS Digital Integrated Circuit Design
Biomedical Devices and Sensors
Wireless Devices Programming
Video Game Design
Cryptography
Microcontrollers
Embedded Systems
Computer Systems Engineering
Human-Computer interaction
Special Topics in Computer Software
Computer Security
Wireless Personal Area Networks
Cloud Computing

Machine Learning
Computer Animation
Numerical Geometry of Images
Internet of Things
Applied Digital Design Laboratory (1 credit)
Nanoelectronics for Computer Engineers
XML and Web Services
Multi-core and GPU Programming
Computer Network Design and Configuration
Quantum Computation
Advanced Microcontrollers
Processor Design
Database Management and Implementation
Data Science and Big Data Analytics
Internetworking
Wireless Communications
Modern Computer Networks

*** can choose these subjects but only 3 credits (1 subject): Introduction to Railway System Engineering/Programmable Logic Controller/Introduction to Robotics/Engineering Economic/Engineering Management



Electronic Systems Engineering



Area of Concentration Course (105 Credits)

- **Basic Course (31 credits):**

Engineering Workshop Practice
General Chemistry
Calculus for Engineering I
Calculus for Engineering III
Fundamentals of Physics I
General Physics Laboratory I
Python Programming

Engineering Drawing
General Chemistry Laboratory
Calculus for Engineering II
Differential Equations for Engineering
Fundamentals of Physics II
General Physics Laboratory II

- **Core Course (62 or 65 credits)**

- **Basic Profession course for Electronic Systems Engineering (46 credits):**

Electric Circuits
Electrical Instruments and Measurements
Electrical Engineering Laboratory I
Electrical Engineering Laboratory III
Fundamentals of Electrical Machines
Control Systems
Power Electronics
C Programming Language for Embedded Systems
Applied Statistics for Researches and Developments
Elementary Signal Transform Theory and Linear Algebra
Introduction to Communication Systems and Computer Networks

Fundamentals of Electrical Engineering
Semiconductor Devices
Electromagnetic Fields
Electrical Engineering Laboratory II
Digital Logic Design
Computational Method
Digital Signal Processing
Electronic Systems Engineering Laboratory

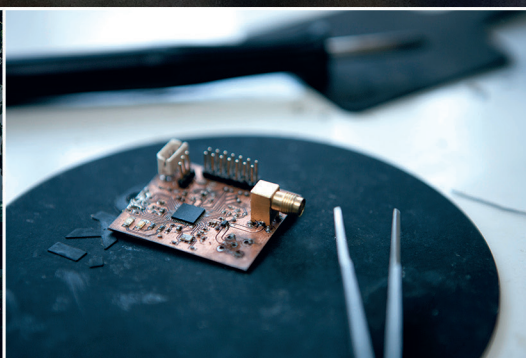
- **Profession course for Electronic Systems Engineering** (13 or 16 credits):

Analog Electronics I Analogue Electronics II Sensors and Transducers
 Electronic Systems Engineering Profession Practices and Skills I
 Electronic Systems Engineering Profession Practices and Skills II
 Electronic Systems Engineering Profession Practices and Skills III
 Electronic Systems Engineering Profession Practices and Skills IV
 Electronic Systems Engineering Pre-project (for student who choose Practical Training)
 Electronic Systems Engineering Project (for student who choose Practical Training)

- **Practical Training and Cooperative Education** (1 or 6 credits): choose one of these subjects; Practical Training (1 credit, non credit) or Cooperative Education in Electronic Systems Engineering (6 credits)

- **Prescribed Elective Course:** select these subjects at least 9 credits (3 subjects) for student who choose Cooperative Education in Environmental Engineering and at least 12 credits (4 subjects) for student who choose Practical Training:

Programmable Logic Controller	Introduction to Robotics
Linear Control Systems	Digital Control Systems
Intelligent Systems	Mechatronics
Automation System Engineering	Applied Electronics
Noise Reduction Techniques in Electronic Systems	Basic Packaging Design
Electronic Instruments	Biomedical Electronics
Filter Design	Datastorage Technology
Magnetism Magnetic Materials and Devices	Audio Engineering
Very Large Scale Integration Design	Microwave Engineering
Engineering Economy	Business and Marketing for Designer
Principles of Microelectronic Device Fabrication	
Special Topics in Electronic Systems Engineering I	
Special Topics in Electronic Systems Engineering II	



Telecommunications Engineering

International Program



Area of Concentration Course (108 Credits)

- **Basic Course** (37 credits):

Statics
Engineering Drawing
General Chemistry
Calculus for Engineering I
Calculus for Engineering III
Fundamentals of Physics I
General Physics Laboratory I
Engineering Materials

Engineering Workshop Practice
Computer Programming
General Chemistry Laboratory
Calculus for Engineering II
Differential Equations for Engineering
Fundamentals of Physics II
General Physics Laboratory II

- **Core Course** (59 or 62 credits)

- **Basic Profession course for Telecommunications Engineering** (29 credits):

Electric Circuits
Application of Probability and Random Process
Electromagnetic Fields
Electrical Engineering Laboratory I
Computational Methods
Elementary Signal Transform Theory and Linear Algebra

Electrical Instruments and Measurements
Digital Logic Design
Analogue Electronics I
Electrical Engineering Laboratory II
Control Systems

- **Profession course for Telecommunications Engineering** (27 or 30 credits):

Principle of Communication
Communication Networks and Transmission Lines
Digital Communication
Antenna Engineering
Telecommunications Engineering Laboratory I
Telecommunications Engineering Laboratory II

Digital Signal Processing
Broadband Communication
Data Communication and Networking
Mobile Communication

Telecommunications Engineering Pre-project (for student who choose Practical Training)
Telecommunications Engineering Project (for student who choose Practical Training)

- **Practical Training and Cooperative Education** (1 or 6 credits): choose one of these subjects; Practical Training (1 credit, non credit) or Cooperative Education in Telecommunications Engineering (6 credits)
- **Prescribed Elective Course:** select these subjects at least 9 credits (3 subjects) for student who choose Cooperative Education in Telecommunications Engineering and at least 12 credits (4 subjects) for student who choose Practical Training:
 - Acoustic Engineering
 - Electromagnetic Wave Propagation
 - Optical Communication
 - Computer Network Design and Configuration
 - Special Topics in Telecommunications Engineering I
 - Special Topics in Telecommunications Engineering II
 - Microwave Engineering
 - Electromagnetic Compatibility
 - Forward Error Correcting Coding



Logistics Engineering International Program



Area of Concentration Course (105 Credits)

• **Basic Course** (34 credits):

Statics
Engineering Drawing
General Chemistry
Calculus for Engineering I
Calculus for Engineering III
Fundamentals of Physics I
General Physics Laboratory I

Engineering Workshop Practice
Computer Programming
General Chemistry Laboratory
Calculus for Engineering II
Differential Equations for Engineering
Fundamentals of Physics II
General Physics Laboratory II

• **Core Course** (62 or 65 credits)

• **Basic Profession course for Logistics Engineering** (16 credits):

Engineering Materials
Manufacturing Processes
Fundamentals of Electrical Engineering
Fundamentals of Electrical Engineering Laboratory

Engineering Statistics
Thermodynamics I

• **Profession course for Logistics Engineering** (43 or 46 credits):

Industrial Engineering Laboratory
Manufacturing Engineering Laboratory
Computer Application in Industry
Industrial Plant Design and Facilities Planning
Engineering Economics
Materials Handling Engineering
Seminar for Logistics Engineering
Network Flow Modeling for Logistics Application
Mechanical and Materials Engineering Laboratory
Industrial Work Study and Productivity Improvement
Logistics Engineering Pre-Project (for student who choose Practical Training)
Logistics Engineering Project (for student who choose Practical Training)

Operations Research
Production Planning and Control
Quality Control
Safety Engineering
Logistics and Supply Chain Management
Inventory and Warehouse Management
Transportation and Distribution

- **Practical Training and Cooperative Education** (1 or 6 credits): choose one of these subjects; Practical Training (1 credit, non credit) or Cooperative Education in Logistics Engineering (6 credits)

- **Prescribed Elective Course:** select these subjects at least 6 credits (2 subjects) for student who choose Cooperative Education in Logistics Engineering and at least 9 credits (3 subjects) for student who choose Practical Training:

Industrial Cost Analysis and Budgeting

Computer Simulation Technique

Engineering Management

Introduction to Quality Engineering and Management

Management of Logistics Information Technology

Introduction to Railway System Engineering

Railway System Planning and Administration

Special Topics in Logistics Engineering

Transport Logistics Management Systems

Performance Analysis and Multiple Criteria Decision

Industrial Management

Project Feasibility Study

Marketing for Engineers

Introduction to Probability Models

Train Operation and Control

Railway Project Administration

Introduction to Rail Track Design



Chemical Engineering

International Program



Area of Concentration Course (110 Credits)

- **Basic Course** (34 credits):

Statics
Engineering Drawing
General Chemistry
Calculus for Engineering I
Calculus for Engineering III
Fundamentals of Physics I
General Physics Laboratory I

Engineering Workshop Practice
Computer Programming
General Chemistry Laboratory
Calculus for Engineering II
Differential Equations for Engineering
Fundamentals of Physics II
General Physics Laboratory II

- **Core Course** (67 or 70 credits)

- **Basic Profession course for Chemical Engineering** (20 credits):

Engineering Materials
Material and Energy Balances
Basic Organic Chemistry
Physical Chemistry
Analytical Chemistry Laboratory for Chemical Engineers

Design of Engineering Experiments
Chemical Process Instrumentation
Basic Organic Chemistry Laboratory

- **Profession course for Chemical Engineering** (44 or 47 credits):

Chemical Engineering Thermodynamics
Unit Operations for Momentum Transfer
Heat and Mass Transfer
Unit Operations for Mass Transfer
Mass Transfer Laboratory
Safety Management in Chemical Industry
Chemical Kinetics and Reactor Design
Process Cost Estimation
Chemical Plant Design

Momentum Transfer
Momentum Transfer Laboratory
Unit Operations for Heat Transfer
Heat Transfer Laboratory
Process Modeling and Simulation
Process Dynamics and Control
Seminar in Chemical Engineering
Chemical Industrial Processes

Chemical Engineering Pre-Project (for student who choose Practical Training)
Chemical Engineering Project (for student who choose Practical Training)

- **Practical Training and Cooperative Education** (1 or 6 credits):

choose one of these subjects; Practical Training (1 credit, non credit) or Cooperative Education in Chemical Engineering (6 credits)

- **Prescribed Elective Course:** select these subjects at least 6 credits (2 subjects) for student who choose Cooperative Education in Chemical Engineering and at least 9 credits (3 subjects) for student who choose Practical Training:

Separation Technology

Computer Applications in Chemical Engineering

Composite and Product Design

Electrochemical Technology for Chemical

Alternative fuels and renewable energy technologies

Special Topics in Chemical Engineering

Environmental Chemical Engineering

Air Pollution Control in Chemical Plant

Industrial Work Study and Productivity Improvement

Introduction to Process Design for Petroleum Industries

Polymer Technology

Biomass Conversion Technology

Introduction to Encapsulation

Engineering Engineering Management

Industrial Management

Basic Biochemical Engineering

Manufacturing Processes

Operations Research

Quality Control



Digital Media Engineering

International Program



Area of Concentration Course (107 Credits)

- **Basic Course (27 credits):**

Engineering Workshop Practice
Calculus for Engineering I
Calculus for Engineering III
Fundamentals of Physics I
General Physics Laboratory I
Fundamentals of Computer Programming

Engineering Drawing
Calculus for Engineering II
Differential Equations for Engineering
Fundamentals of Physics II
General Physics Laboratory II

- **Core Course (59 or 62 credits)**

Introduction to Digital Media
Digital Electronics
Object Oriented Programming
Introduction to Discrete Mathematics
Computer Graphics
Interactive Web Programming
Professional Skills Development
Game Programming
Project Management Body of Knowledge
Computer Networking and Internet Technology

Art and Design Foundation
Introduction to Data Structures
Object Oriented Programming Laboratory
Digital Media Processing
3D Modeling and Animation
Computer-Generated Imagery
User Interface and User Experience Design
Game Design
Multimedia Database
Interaction Design

Digital Media Engineering Pre-Project (for student who choose Practical Training)
Digital Media Engineering Project (for student who choose Practical Training)

*** choose one of these subjects; Practical Training (1 credit, non credit) or Cooperative Education in Digital Media Engineering (6 credits)

- **Prescribed Elective Course:** select these subjects at least 18 credits (6 subjects) for student who choose Cooperative Education in Digital Media Engineering and at least 21 credits (7 subjects) for student who choose Practical Training:

Parallel Programming

Character Animation and Control

Shading, Lighting and Rendering

Character and Theme Design

Advanced Game Programming

Advanced Computer Graphics

Digital Compositing and Post-production

Artificial Intelligence

Virtual Reality

Sound Design for Game and Animation

Information Architecture and Visualization

Ubiquitous Computing

e-Learning

Introduction to Software Engineering

Effective Presentation Technique

3D Animation Pipeline

3D modelling and Digital Sculpting

Visual Effects

Mobile Application Development

Python Scripting for Animation

3D Animation Pre-Production

Online Game Development

Dynamic Simulation

Gamification

Serious Game

Computer network programming

Social Media

Special Topics in Digital Media Engineering

