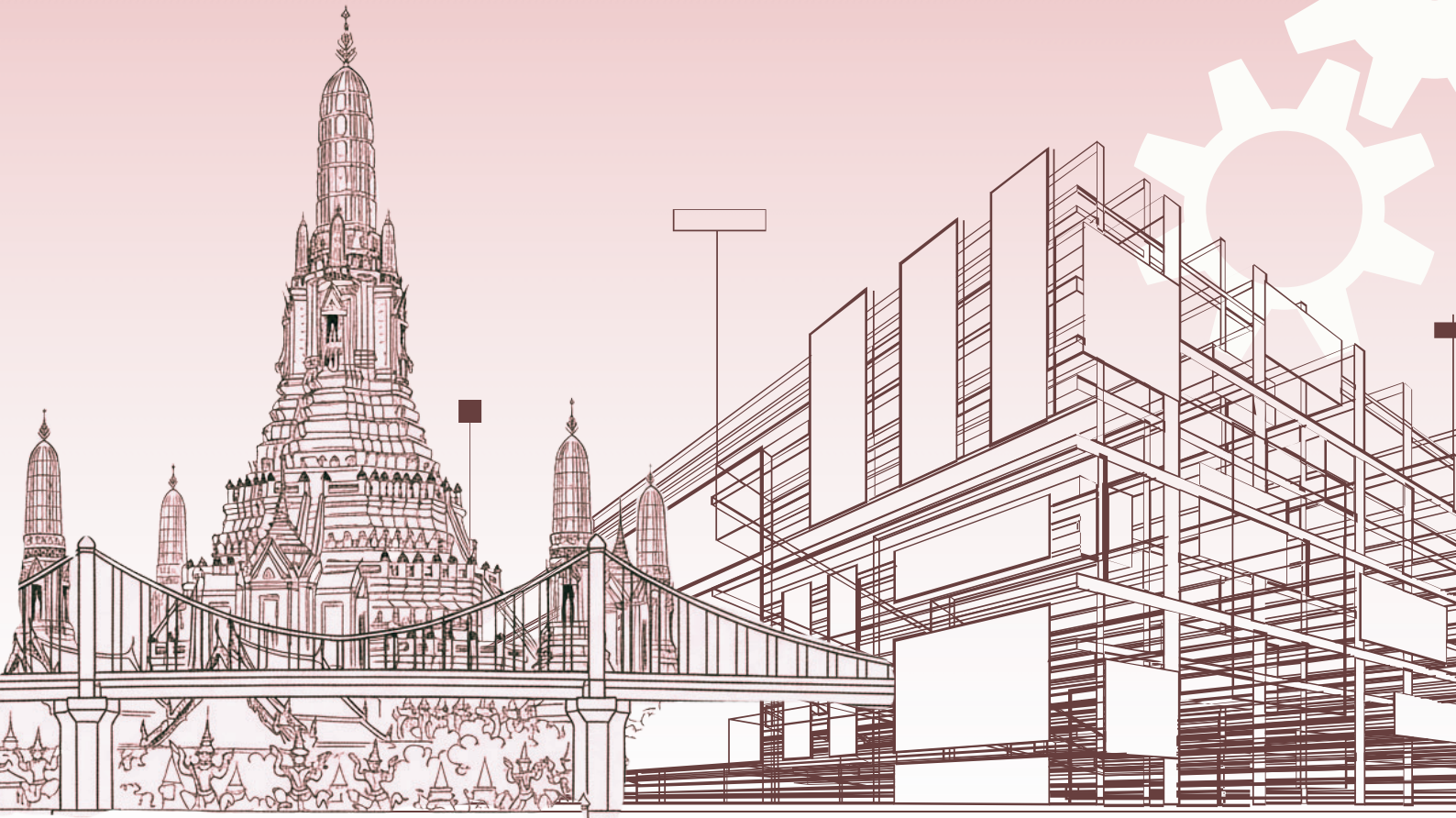
คณะวิศวกรรมศาสตร์
มหาวิทยาลัยกรุงเทพธนบุรี
Faculty of Engineering
工程学院



คณะวิศวกรรมศาสตร์ 工程学院
FACULTY OF ENGINEERING
BANGKOKTHONBURI UNIVERSITY

หลักสูตรวิศวกรรมศาสตรบัณฑิต สาขาวิชาวิศวกรรมเครื่องกล
Bachelor of Engineering Program in Mechanical Engineering
工程学学士（机械工程）

Program Philosophy | 课程理念

The program aims to produce bachelor's degree graduates in Mechanical Engineering who possess strong moral integrity and professional ethics, with competencies in research, development, and control in mechanical engineering. Graduates are capable of performing professional duties efficiently and contributing effectively to industry and society. 本课程旨在培养具备良好道德素养与职业伦理的机械工程学士毕业生，具备机械工程领域的研究、开发与控制能力，能够高效从事专业工作并为产业与社会作出积极贡献。

Program Significance | 课程重要性

This program responds to social and economic changes at both national and global levels and addresses the shortage of qualified mechanical engineers in industry. 本课程能够适应泰国及国际社会与经济的发展变化，并有效解决机械工程专业人才短缺的问题。

Career Opportunities | 就业方向

1. Mechanical Engineer
   a. Design, control, and maintain machinery; manage industrial production systems; design and control engineering systems such as HVAC, fluid systems, mechanical systems, and energy efficiency solutions. 机械工程师：从事机械设计、生产控制、设备维护、工业系统、空调系统、流体系统及能源管理等工作。
2. Researcher
   a. Conduct research in mechanical engineering and related fields such as energy, aerospace, robotics, and automotive engineering. 研究人员：从事机械工程及相关领域（能源、航空航天、机器人、汽车工程等）的研究工作。
3. Teacher / Lecturer
   a. Teach in educational institutions specializing in science and technology. 教师 / 讲师：在科学与技术相关教育机构任教。



课程总学分 | Total Credits Required
138 学分 Credits
4 Years Course 四年制
FullTime 全日制

四年制学习计划 | 4-Year Study Plan

Year 1 – Semester 1 ｜ 第 1 年 · 第 1 学期		
Course Code	**Course Title 课程名称**	**Credits 学分**
GE 103	English for Communication / 交际英语	3 (2-2-5)
EI 101	Calculus I / 微积分 I	3 (3-0-6)
EI 103	General Physics I / 普通物理 I	3 (3-0-6)
EI 104	Physics Laboratory I / 物理实验 I	1 (0-2-1)
ME 101	Engineering Drawing / 工程制图	3 (2-2-5)
ME 105	Engineering Materials / 工程材料	3 (3-0-6)
ME 106	Manufacturing Processes / 制造工艺	3 (3-0-6)
Total	**合计**	**19 (16-6-35)**
**Year 1 – Semester 2	第 1 年 · 第 2 学期**	
Course Code	**Course Title 课程名称**	**Credits 学分**
GE 104	English for Life Reading / 实用英语阅读	3 (2-2-5)
EI 102	Calculus II / 微积分 II	3 (3-0-6)
EI 105	General Physics II / 普通物理 II	3 (3-0-6)
EI 106	Physics Laboratory II / 物理实验 II	1 (0-2-1)
EI 107	General Chemistry / 普通化学	3 (3-0-6)
EI 108	Chemistry Laboratory / 化学实验	1 (0-2-1)
ME 103	Computer Programming for Engineers / 工程师计算机编程	3 (2-2-5)
ME 104	Engineering Mechanics I / 工程力学 I	3 (3-0-6)
Total	合计	**20 (16-8-36)**
**Year 1 – Summer Semester	第一年暑假学期**	
Course Code	**Course Title 课程名称**	**Credits 学分**
GE 102	Thai for Career Purposes / 职业泰语	3 (2-2-5)
GE 105	Leadership and Anti-Corruption Studies / 领导力与反腐败	3 (2-2-5)
Total	**合计**	**6 (4-4-10)**

四年制学习计划 | 4-Year Study Plan

Year 2 – Semester 1	第 2 年 · 第 1 学期	
Course Code	**Course Title 课程名称**	**Credits 学分**
EI 201	Calculus III / 微积分 III	3 (3-0-6)
EI 202	Linear Algebra for Engineers / 工程线性代数	3 (3-0-6)
ME 102	Basic Engineering Laboratory / 工程基础实验	2 (0-4-2)
ME 201	Thermodynamics / 热力学	3 (3-0-6)
ME 204	Engineering Mechanics II / 工程力学 II	3 (3-0-6)
ME 205	Fundamentals of Electrical & Digital Technology / 电气与数字技术基础	3 (2-2-5)
Total	合计	**17 (14-6-31)**

Year 2 – Semester 2	第 2 年 · 第 2 学期	
Course Code	**Course Title 课程名称**	**Credits 学分**
GE 112	Principles of Statistics / 统计学原理	3 (2-2-5)
EI 203	Numerical Methods for Engineers / 工程数值方法	3 (3-0-6)
ME 202	Fluid Mechanics / 流体力学	3 (3-0-6)
ME 203	Mechanics of Materials / 材料力学	3 (3-0-6)
ME 206	Mechanical Engineering Laboratory I / 机械工程实验 I	1 (0-2-1)
ME 207	CAD for Mechanical Engineering / 机械工程计算机辅助设计	3 (2-2-5)
Total	合计	**16 (13-6-29)**

四年制学习计划 | 4-Year Study Plan

Year 3 – Semester 1 | 第 3 年 · 第 1 学期		
Course Code	**Course Title 课程名称**	**Credits 学分**
ME 303	Refrigeration & Air Conditioning / 制冷与空调	3 (3-0-6)
ME 306	Mechanical Vibrations / 机械振动	3 (3-0-6)
ME 309	CAE for Mechanical Engineering / 机械工程计算机辅助工程	3 (3-0-6)
ME 311	Capstone Project I / 顶点项目 I	3 (2-2-5)
xx xxx	Professional Elective / 专业选修课	1 (0-3-2)
xx xxx	Free Elective / 自由选修课	3 (x-x-x)
Total	合计	**16 (x-x-x)**

Year 3 – Semester 2 | 第 3 年 · 第 2 学期		
Course Code	**Course Title 课程名称**	**Credits 学分**
ME 303	Refrigeration & Air Conditioning / 制冷与空调	3 (3-0-6)
ME 306	Mechanical Vibrations / 机械振动	3 (3-0-6)
ME 309	CAE for Mechanical Engineering / 机械工程计算机辅助工程	3 (3-0-6)
ME 311	Capstone Project I / 顶点项目 I	3 (2-2-5)
xx xxx	Professional Elective / 专业选修课	1 (0-3-2)
xx xxx	Free Elective / 自由选修课	3 (x-x-x)
Total	合计	**16 (13-6-29)**

Year 3 – Summer Semester | 第 3 年暑假学期		
Course Code	**Course Title 课程名称**	**Credits 学分**
GE 111	Computers & IT in Digital Age / 数字时代的计算机与信息技术	3 (2-2-5)
Total	合计	**3 (2-2-5)**

四年制学习计划 | 4-Year Study Plan

Year 4 – Semester 1 | 第 4 年 · 第 1 学期		
Course Code	**Course Title 课程名称**	**Credits 学分**
ME 401	Production Engineering / 生产工程	3 (3-0-6)
ME 402	Maintenance Engineering / 维修工程	3 (3-0-6)
ME 403	Advanced Engineering Design / 高级工程设计	3 (2-2-5)
ME 405	Engineering Management / 工程管理	3 (3-0-6)
ME 411	Capstone Project II / 顶点项目 II	3 (0-6-3)
Total	合计	**15 (x-x-x)**
Year 4 – Semester 2 | 第 4 年 · 第 2 学期		
Course Code	**Course Title 课程名称**	**Credits 学分**
ME 498	Cooperative Education / Internship / 工程实习（合作教育）	6 (0-18-0)
xx xxx	Professional Elective / 专业选修课	3 (x-x-x)
xx xxx	Free Elective / 自由选修课	3 (x-x-x)
Total	合计	**16 (13-6-29)**



Professional Elective Courses
专业选修课

- **Electric Vehicle Technology 电动车技术方向 (4 门课)**
  - ME 329 Basic Knowledge of Electric Vehicles, Standards and Safety
    电动车基础、标准与安全。 | Credits 学分：(3(3-0-6)
  - ME 330 Electric Vehicle Drivetrain and Communication Systems
    电动车传动与通信系统。 | Credits 学分：(3(3-0-6)
  - ME 331 Battery Energy Management and Charging Systems
    电池能量管理与充电系统。 | Credits 学分: 3 (3-0-6)
  - ME 332 Electric Vehicle Maintenance and Problem Diagnosis
    电动车维修与故障诊断。 | Credits 学分: 3 (3-0-6)

- **Intelligent Mechanical Engineering 智能机械工程方向**
  - ME 313 Computer-Aided Design for Mold Design
    计算机辅助模具设计 | Credits 学分: 3 (2-2-5)
  - ME 314 Building Information Modeling for Mechanical Engineering
    机械工程建筑信息建模（BIM） | Credits 学分: 3 (2-2-5)
  - ME 315 Computer-Aided Simulation of Industrial Robotics
    工业机器人计算机辅助仿真 | Credits 学分: 3 (2-2-5)
  - ME 316 Computer-Aided Design of Intelligent Manufacturing Processes
    智能制造过程计算机辅助设计 | Credits 学分: 3 (2-2-5)



Professional Elective Courses—Electric Vehicle Technology
专业选修课 – 电动车技术方向 (4 门课)

- **ME 329 Basic Knowledge of Electric Vehicles, Standards and Safety**
  电动车基础、标准与安全。 | Credits 学分(3(3-0-6)

  This course introduces fundamental concepts of electric vehicles with emphasis on high-voltage safety and standards. Topics include PPE, vehicle structures, operating principles of conventional, hybrid, plug-in hybrid, EREV, and electric vehicles, EV motor types (DC/AC), high-voltage systems, drive configurations, and international and Thai EV standards. Practical aspects cover EV maintenance areas, tools and equipment standards, high-voltage disconnection, fire safety, accident response, and CPR. 本课程介绍电动车的基础知识，重点关注高压电安全与相关标准。内容涵盖个人防护装备、车辆结构、各类车辆运行原理、电动车直流与交流电机、高压系统、驱动方式，以及国际与泰国电动车标准，并包括维修安全、断电流程、消防与事故救援及心肺复苏（CPR）。

- **ME 330 Electric Vehicle Drivetrain and Communication Systems电动车传动与通信系统**
  Credits 学分(3(3-0-6)

  This course introduces EV drivetrain and communication systems, covering fundamentals of motor control, EV drivetrain structures, VCU and MCU, powertrain control circuits, and testing of EV motors and high-voltage systems. Topics include regenerative braking, cooling, transmission, braking, and performance control systems, as well as ADAS. The course also focuses on EV communication systems, including CAN BUS principles and standards, FlexRay and FD CAN, data exchange, diagnostics, troubleshooting, and safe maintenance of EV drivetrain systems using standardized tools.本课程介绍电动车传动与通信系统，内容涵盖电机控制基础、电动车传动系统结构、车辆控制单元（VCU）与电机控制单元（MCU）、动力传动控制及高压系统检测。课程还包括能量回收制动、冷却与性能控制系统、ADAS，以及电动车通信系统，重点学习 CAN BUS、FlexRay 与 FD CAN 的原理、数据通信、系统诊断、故障排除及安全维护。

Professional Elective Courses—Electric Vehicle Technology
专业选修课 – 电动车技术方向 (4 门课)

- **ME 331 Battery Energy Management and Charging Systems 电池能量管理与充电系统**
- **Credits 学分: 3 (3-0-6)**

This course introduces EV battery systems, covering battery structures, components, and types, battery energy management systems (BMS), and fundamentals of EV battery technology. Topics include high-voltage battery safety, thermal runaway prevention, battery design for safe use, battery state evaluation (SOP, SOC, SOH), charging and discharging methods, cell balancing, charging tools and station inspections, and maintenance of high-voltage battery and cooling systems in accordance with EV service manuals. 本课程介绍电动车电池能量管理与充电系统，内容涵盖电池结构与类型、电池管理系统（BMS）、电池技术基础、高压电池安全与热失控预防、电池状态评估（SOP、SOC、SOH）、充放电方法、电池均衡、充电工具与充电站检测，以及依据维修手册进行高压电池与冷却系统的维护。

- **ME 332 Electric Vehicle Maintenance and Problem Diagnosis 电动车维修与故障诊断**
- **Credits 学分: 3 (3-0-6)**

This course focuses on EV maintenance and diagnostic practices. Topics include EV fundamentals review, safety preparation and hazard prevention in service centers, use of maintenance tools, reading repair manuals and electrical schematics, high-voltage isolation procedures for different EV brands, battery lifting and module replacement, motor and ECU inspection and replacement, ECU coding and fault code diagnosis, scheduled servicing, and troubleshooting EV systems in accordance with repair manuals. 本课程重点介绍电动车的维护与故障诊断。内容涵盖电动车基础复习、维修中心安全与风险防护、维修工具使用、维修手册与电路图识读、高压断电操作、电池拆装与模块更换、电机与 ECU 检测及编程、故障代码诊断、定期保养，以及依据维修手册进行故障排除。