

Course Structure for Undergraduate Program

Department of Industrial Education

National Taiwan Normal University

Adaptive to Class of	Common Courses Credit(s)	Required Credit(s)	Elective Credit(s)	Free Elective Credit(s)	Minimum Total Credits for Graduation
115	32.0	Power Mechanical Engineering Group 56.0 Mechanical Engineering Group 56.0 54.0 54.0	Power Mechanical Engineering Group 8.0 Mechanical Engineering Group 12.0 12.0 12.0	Power Mechanical Engineering Group 32.0 Mechanical Engineering Group 28.0 30.0 30.0	Power Mechanical Engineering Group 128.0 Mechanical Engineering Group 128.0 128.0 128.0

I. General Course: 32.0 credits are required

Course Name	Credit(s)
1 Chinese 4.0 credits are required	
1-1 Chinese Reading and Thinking	2.0
1-2 Chinese Writing and Expression	2.0
2 English 6.0 credits are required, Students who major in Department of English must take the course which course code are ENU0168 and ENU0169 with a passing score for instead	
2-1 English(I)	2.0
2-2 English(II)	2.0
2-3 English(III)	2.0
3 General Education Courses 18.0 credits are required	
3-1 Liberal Arts Course 8.0 credits are required	
3-1-1 Humanities and Arts 2.0 credits are required	
3-1-2 Social Sciences 2.0 credits are required	
3-1-3 Natural Sciences 2.0 credits are required	
3-1-4 Logic and Computing 2.0 credits are required	
3-2 Cross-domain Exploration 4.0 credits are required	
3-2-1 College Common Course	
3-2-2 Cross-domain Professional Discovery Course	
3-2-3 Introduction to University Studies	
3-3 Self-Directed Learning maximum credits are 4.0	
3-3-1 Inquiry Study	
3-3-2 MOOCs	
4 Physical Education 4.0 credits are required, 4 courses are least required	

Note: The first alphabet "E" on the course name refers to the course in English as a medium of instruction

II. Required Courses: 39.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
MAU0180	1 E Calculus B (I)	3.0	3.0	0.0	
IEU4365	2 Teaching and Assessment of Industrial Subjects	2.0	2.0	0.0	
IEU4364	3 Industrial Subject Curriculum Development and Teaching Materials Design	2.0	2.0	0.0	
IEU0111	4 Introduction to Technological and Vocational Education	2.0	2.0	0.0	
IEU0119	5 Computer Programming	3.0	3.0	0.0	
IEU4370	6 Electric Circuits (I)	3.0	3.0	0.0	
IEU4371	7 Engineering Mathematics (I)	3.0	3.0	0.0	
H5C9001	8 Career Ethics	2.0	2.0	0.0	
IEU4372	9 Electronics (I)	3.0	3.0	0.0	
IEU0009	10 Industrial Safety and Hygiene	2.0	2.0	0.0	
IEU4379	11 Workshop Layout and Management	2.0	2.0	0.0	
IEU4373	12 Special Project (I)	2.0	2.0	0.0	
IEU4374	13 Special Project (II)	2.0	2.0	0.0	
IEU4375	14 Training for Professional Techniques (I)	2.0	2.0	0.0	
IEU4376	15 Training for Professional Techniques (II)	2.0	2.0	0.0	
IEU4377	16 Training for Professional Techniques (III)	2.0	2.0	0.0	
IEU4378	17 Training for Professional Techniques (IV)	2.0	2.0	0.0	

III. Elective Courses: 4.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
IEU4366	1 Integrating Digital Technology into Industrial Curriculum and Teaching	2.0	2.0	0.0	
IEU4369	2 Cooperation between Education and Industry and Academia	2.0	2.0	0.0	
IEU4368	3 Vocational Education Policy and School Administration	2.0	2.0	0.0	

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
IEU4367	4 Application of Artificial Intelligence in Industrial Education	2.0	2.0	0.0	

IV. Courses Offered to Students in Different Divisions

A-1. Required Course for Power Mechanical Engineering Group, 17.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
VEU0002	1 Introduction to Energy Technology	2.0	2.0	0.0	
VEU0016	2 Electric Vehicle	3.0	3.0	0.0	
VEU0006	3 Introduction to Power Mechanics	3.0	3.0	0.0	
VEU0012	4 Internal Combustion Engine	3.0	3.0	0.0	
VEU0011	5 E Thermo-Dynamics (I)	3.0	3.0	0.0	
VEU0014	6 Automatic Control Engineering	3.0	3.0	0.0	

A-2. Elective Course for Power Mechanical Engineering Group, 4.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
VEU0013	1 E Applied Mechanics	3.0	3.0	0.0	
VEU0045	2 Fluid Mechanics	3.0	3.0	0.0	
VEU0064	3 Engine Rebuilding	3.0	2.0	2.0	
VEU0072	4 Automotive Chassis Repair	3.0	2.0	2.0	
VEU0071	5 Automotive Chassis Repair (II)	3.0	2.0	2.0	
VEU0027	6 Refrigeration and Air Conditioning Principle	3.0	3.0	0.0	
VEU0076	7 Vehicle Basic Technology	3.0	2.0	2.0	
VEU0074	8 Gasoline Engine Diagnosis	3.0	2.0	2.0	
VEU0021	9 Automotive Electronics	3.0	3.0	0.0	
VEU0059	10 Diesel Engine Repair	3.0	2.0	2.0	
VEU0036	11 Vehicle Design	3.0	3.0	0.0	
VEU0057	12 Internal Combustion Engine Test	3.0	2.0	2.0	
VEU0061	13 Automotive Electric System Repair	3.0	2.0	2.0	
VEU0020	14 Introduction to Vehicle Engineering	3.0	3.0	0.0	
VEU0019	15 Engineering Graphics and Computer-Aided Design	3.0	3.0	0.0	
VEC9015	16 Novel Vehicle Technologies	3.0	3.0	0.0	
IEU1190	17 Automotive Materials	3.0	3.0	0.0	

B-1. Required Course for Mechanical Engineering Group, 17.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
MTU0005	1 The Processes of Manufacturing	3.0	3.0	0.0	
MTU0028	2 Automatic Control Engineering	3.0	3.0	0.0	
MTU0026	3 Mechanics of Materials	3.0	3.0	0.0	
MTU0098	4 Statics	2.0	2.0	0.0	
MTU0025	5 Mechanisms	3.0	3.0	0.0	
MTC0014	6 E Nano Science and Technology	3.0	3.0	0.0	

B-2. Elective Course for Mechanical Engineering Group, 8.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
MTU0097	1 Materials Science	3.0	3.0	0.0	
MTU0117	2 Engineering Graphics	2.0	1.0	3.0	
MTU0003	3 The Mechanical Technology	2.0	1.0	3.0	
MTU0021	4 Computer Aided Drawing	2.0	1.0	3.0	
MTC9012	5 Mechanical Practical Skills	3.0	2.0	2.0	
MTC9018	6 E Semiconductor Fabrication Process	3.0	3.0	0.0	
MTU0030	7 Programmable Logic Control	3.0	3.0	0.0	
MTU0046	8 Principle and Apply of the Fluid Control	3.0	3.0	0.0	
MTU0102	9 Experiments of Electric Circuits	1.0	0.0	3.0	
MTU0029	10 The Technology of Mechatronics	1.0	0.0	2.0	
MTC0002	11 Robotics	3.0	3.0	0.0	
MTU0075	12 Applied Electronics (I)	3.0	3.0	0.0	
MTC9010	13 Intelligent Manufacturing Technology	3.0	3.0	0.0	
MTC0009	14 Introduction to Micro-Electro-Mechanical System Technology	3.0	3.0	0.0	
MTC0016	15 Micro Actuators and Sensors Analysis and Design	3.0	3.0	0.0	
MTC0017	16 E Linear Control Systems	3.0	3.0	0.0	
MTC0013	17 Servo Control	3.0	3.0	0.0	
MTC0004	18 Finite Element Analysis	3.0	3.0	0.0	

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
MTC0020	19 Computer-Aided Mechanism Analysis	3.0	3.0	0.0	
MTU0105	20 Mechanical Engineering Design	3.0	3.0	0.0	
MTU0101	21 Dynamics	3.0	3.0	0.0	
MTC0022	22 Computer-Aided Optical Design	3.0	3.0	0.0	
MTC0027	23 Laser Engineering Technology and Applications	3.0	3.0	0.0	
MTC9002	24 Precision Mechanical System Design and Practice	3.0	3.0	0.0	
MTC0019	25 E Applied Optics	3.0	3.0	0.0	
MTC7001	26 E Precision Micro Manufacturing Engineering	3.0	3.0	0.0	
MTU0103	27 Computer-Aided Manufacturing	3.0	3.0	0.0	
MTC9021	28 Mold Design and Manufacturing	3.0	2.0	2.0	
MTU0024	29 Mechanical Engineering Experiments	1.0	0.0	3.0	
MTU0060	30 Fluid Mechanics	3.0	3.0	0.0	
MTU0039	31 Thermodynamics	3.0	3.0	0.0	
MTU0067	32 Heat Transfer	3.0	3.0	0.0	
MTC0012	33 E Analysis and Design of Thermal-Fluid Systems	3.0	3.0	0.0	
MTC9004	34 Nano/micro-Thermal-Fluidic Systems	3.0	3.0	0.0	
MTC0010	35 Ultra Precision Machining	3.0	3.0	0.0	
MTU0104	36 The Principle and Technology of Computerized Numerical Control Machine Tools	3.0	2.0	2.0	
IEU0121	37 Precision Casting	3.0	3.0	0.0	
MTC9013	38 Precision Welding Engineering	3.0	3.0	0.0	

C-1. Required Course for , 15.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
AEU0003	1 Digital Systems	3.0	3.0	0.0	
AEU0005	2 E Introduction to Computer Science	3.0	3.0	0.0	
AEU0011	3 Electronics (II)	3.0	3.0	0.0	
AEU0015	4 E Engineering Mathematics (II)	3.0	3.0	0.0	
AEU0025	5 Signals and Systems	3.0	3.0	0.0	

C-2. Elective Course for , 8.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
AEU0004	1 E Digital Systems Laboratory	2.0	1.0	3.0	
AEU0017	2 Electric Circuits (II)	3.0	3.0	0.0	
AEU0021	3 Sensors and Transducers	3.0	3.0	0.0	
AEU0023	4 Microprocessors	3.0	3.0	0.0	
AEU0029	5 Programmable Logic Control	3.0	3.0	0.0	
AEU0030	6 Electric Machineries (I)	3.0	3.0	0.0	
AEU0043	7 E Control Systems	3.0	3.0	0.0	
AEU0044	8 Single Chip Control	3.0	3.0	0.0	
AEU0069	9 Electromagnetics	3.0	3.0	0.0	
VEU0002	10 Introduction to Energy Technology	2.0	2.0	0.0	
VEU0011	11 E Thermo-Dynamics (I)	3.0	3.0	0.0	
VEU0014	12 Automatic Control Engineering	3.0	3.0	0.0	
VEU0045	13 Fluid Mechanics	3.0	3.0	0.0	
VEC9001	14 Renewable Energy	3.0	3.0	0.0	
VEC9003	15 Technology of Energy Saving	3.0	3.0	0.0	
VEC9005	16 Refrigeration Engineering and Design	3.0	3.0	0.0	
VEU0027	17 Refrigeration and Air Conditioning Principle	3.0	3.0	0.0	
VEC9006	18 Air Conditioning Engineering and Design	3.0	3.0	0.0	
VEU0051	19 Food Refrigeration	3.0	3.0	0.0	
VEU0052	20 Transportation Refrigeration and Air Conditioning	3.0	3.0	0.0	

D-1. Required Course for , 15.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
AEU0005	1 E Introduction to Computer Science	3.0	3.0	0.0	
AEU0015	2 E Engineering Mathematics (II)	3.0	3.0	0.0	
AEU0011	3 Electronics (II)	3.0	3.0	0.0	
AEU0025	4 Signals and Systems	3.0	3.0	0.0	
AEU0003	5 Digital Systems	3.0	3.0	0.0	

D-2. Elective Course for , 8.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
AEU0027	1 Principles of Communication (I)	3.0	3.0	0.0	
AEU0044	2 Single Chip Control	3.0	3.0	0.0	
AEU0051	3 Electronic Circuits Design	3.0	3.0	0.0	
AEU0040	4 E Electronic Instruments	3.0	3.0	0.0	
AEU0017	5 Electric Circuits (II)	3.0	3.0	0.0	
AEU0004	6 E Digital Systems Laboratory	2.0	1.0	3.0	
AEU0021	7 Sensors and Transducers	3.0	3.0	0.0	
AEU0049	8 Operating Systems	3.0	3.0	0.0	
AEU0016	9 E Computer Architectures	3.0	3.0	0.0	
AEU0023	10 Microprocessors	3.0	3.0	0.0	
AEU0022	11 Data Structures	3.0	3.0	0.0	
AEU0039	12 Object-Oriented Programming	3.0	3.0	0.0	

V. Free Elective Credits

A Free Elective Credit for Power Mechanical Engineering Group, 32.0 credits are required

B Free Elective Credit for Mechanical Engineering Group, 28.0 credits are required

C Free Elective Credit for , 30.0 credits are required

D Free Elective Credit for , 30.0 credits are required