

Course Structure for M.A. Program
Department of Industrial Education
National Taiwan Normal University

Adaptive to Class of	Required Credit(s)	Elective Credit(s)	Free Elective Credit(s)	Minimum Total Credits for Graduation
115	Technical and Vocational Education area 14.0 Technology Application and Management area 18.0	Technical and Vocational Education area 10.0 Technology Application and Management area 10.0	Technical and Vocational Education area 8.0 Technology Application and Management area 4.0	Technical and Vocational Education area 32.0 Technology Application and Management area 32.0

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

I. Required Courses: 8.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
IEM0002	1 Research Methods in Industrial Education (I)	2.0	2.0	0.0	
IEM0084	2 Research Methods in Industrial Education (II)	2.0	2.0	0.0	
IEM0001	3 Educational Statistics	2.0	2.0	0.0	
IEM0095	4 Advanced Educational Statistics (I)	2.0	2.0	0.0	

II. Elective Courses: 0.0 credit is required

III. Courses Offered to Students in Different Divisions

A-1. Required Course for Technical and Vocational Education area, 6.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
IEM0004	1 Seminar on Vocational Technical (I)	1.0	1.0	0.0	
IEM0178	2 Seminar on Vocational Technical (II)	1.0	1.0	0.0	
IEM0377	3 Seminar on Vocational Technical (III)	1.0	1.0	0.0	
IEM0378	4 Seminar on Vocational Technical(IV)	1.0	1.0	0.0	
IEM0179	5 Theories and Methods in Vocational Technical Education	2.0	2.0	0.0	

A-2. Elective Course for Technical and Vocational Education area, 10.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
1 Instrumental course					
IEC0012	1-1 Experimental Design	2.0	2.0	0.0	
IEC0014	1-2 E Statistical Methods for Multivariate Analysis	2.0	2.0	0.0	
IEC8006	1-3 Advanced Educational Statistics (II)	2.0	2.0	0.0	
IEM0085	1-4 Data Processing and Analysis	3.0	3.0	0.0	
2 Management and administrative expertise					
IEC8002	2-1 E Special Topics in Contemporary Technical-Vocational Education Policies	2.0	2.0	0.0	
IEM0019	2-2 Evaluation in Vocational Technological Education	2.0	2.0	0.0	
IEM0423	2-3 Program Factors Concepts and Elements in Technological and Vocational Education	2.0	2.0	0.0	
IEM0354	2-4 Comparative Studies of Vocational Training Systems	2.0	2.0	0.0	
IEM0404	2-5 Technical-Vocational Education Administration and Supervision	2.0	2.0	0.0	
IEM0413	2-6 Enterprise-School Cooperative Theory and Practice	2.0	2.0	0.0	
IEC8012	2-7 A Research on Applying Artificial Intelligence on Technological and Vocational Education	2.0	2.0	0.0	
3					
IEC0003	3-1 E Studies in Learning Theory of Technological and Vocational Education	2.0	2.0	0.0	
IEM0424	3-2 The Study of Instructional Technology in Technological and Vocational Education	2.0	2.0	0.0	
IEM0406	3-3 Teaching Methods of Technical-Vocational Education	2.0	2.0	0.0	
IEM0407	3-4 Teaching Material and Instruction Design of Technical-Vocational Education	2.0	2.0	0.0	
IEM0408	3-5 Test and Measurement Assessment of Technical-Vocational Education	2.0	2.0	0.0	
IEM0409	3-6 Practical Shop Safety and Management of Technical-Vocational Education	2.0	2.0	0.0	
IEM0410	3-7 Curriculum Development of Technical-Vocational Education	2.0	2.0	0.0	
IEM0411	3-8 Career Development of Technical-Vocational Education	2.0	2.0	0.0	

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
IEM0414	3-9 Occupational Analysis	2.0	2.0	0.0	
IEM0098	4 Interdisciplinary Study of Industry Technology and Education	3.0	3.0	0.0	
IEM0145	5 Computerized Testing and Evaluation System	3.0	3.0	0.0	
IEM0403	6 Practice Course and Instructional Design of Technical-Vocational Education	2.0	2.0	0.0	
IEM0412	7 Technical-Vocational Education Law	2.0	2.0	0.0	
IEM0418	8 Stem and Technical Vocational Education	2.0	2.0	0.0	
IEM0420	9 Studies of Technological and Vocational Education and Employment Security	2.0	2.0	0.0	
IEC0026	10 Digital Learning Environment Design	3.0	3.0	0.0	
IEC8007	11 Seminar in Technical Vocational Educational Administration	2.0	2.0	0.0	
IEC8015	12 Technology and Methodology	3.0	3.0	0.0	
IEC8014	13 Study on E-learning System	2.0	2.0	0.0	
IEC8013	14 Special Topics in Digitalized Learning of Technical-Vocational Education	3.0	3.0	0.0	
IEC0031	15 Application and Development of Nanotechnology	3.0	3.0	0.0	
IEM0319	16 Engineering of Nanomaterials	3.0	3.0	0.0	
IEM0053	17 Mechanical Properties of Metal	3.0	3.0	0.0	
IEM0067	18 Principle of Plastic Machine	3.0	3.0	0.0	
IEM0154	19 Special Topic of Casting and Forging of Alloys	3.0	3.0	0.0	
IEM0193	20 Engineering Material	3.0	3.0	0.0	
IEM0364	21 Computer-aided Design and Analysis	3.0	3.0	0.0	
IEM0336	22 Processes of Materials Engineering	3.0	3.0	0.0	
IEM0131	23 Control System Design	3.0	3.0	0.0	
IEM0061	24 Advanced Heat Transfer	3.0	3.0	0.0	

B-1. Required Course for Technology Application and Management area, 10.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
IEM0395	1 Seminar on Technological Application Management(I)	1.0	1.0	0.0	
IEM0396	2 Seminar on Technological Application Management(II)	1.0	1.0	0.0	
IEM0387	3 Seminar on Technological Application Management(III)	1.0	1.0	0.0	
IEM0388	4 Seminar on Technological Application Management(IV)	1.0	1.0	0.0	
IEM0086	5 Technology Management	2.0	2.0	0.0	
IEC0021	6 Strategic Management	2.0	2.0	0.0	
IEC8018	7 Innovation Management	2.0	2.0	0.0	

B-2. Elective Course for Technology Application and Management area, 10.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
IEC8001	1 Special Topics in Human Resource Management	2.0	2.0	0.0	
IEC0011	2 E Commodity Innovation and Pricing	2.0	2.0	0.0	
IEC8003	3 Organization Innovation and Development	2.0	2.0	0.0	
IEC0016	4 The Philosophy and History of Technology	2.0	2.0	0.0	
IEC0027	5 Technology and Social Culture	2.0	2.0	0.0	
IEM0323	6 Development of Technology Policy	2.0	2.0	0.0	
IEC8004	7 Special Topics in Creative Thinking and Innovation of Technical-Vocational Education	2.0	2.0	0.0	
IEC0019	8 Technology Innovation and Transfer	2.0	2.0	0.0	
IEM0346	9 Intellectual Property	2.0	2.0	0.0	
IEC0023	10 Studies in E-Commerce Management	2.0	2.0	0.0	
IEC0024	11 Knowledge - based Economy	2.0	2.0	0.0	
IEM0088	12 Financial Management	2.0	2.0	0.0	
IEM0325	13 R&D and Project Management	2.0	2.0	0.0	
IEM0328	14 Global Business Management	2.0	2.0	0.0	
IEM0333	15 Innovation Management on Small and Medium Enterprise	2.0	2.0	0.0	
IEM0347	16 Studies in Production and Operation Management	2.0	2.0	0.0	
IEM0356	17 Industrial Analysis and Competitive Strategies	2.0	2.0	0.0	
IEM0399	18 Technology Marketing Management	2.0	2.0	0.0	
IEM0400	19 Technology Forecasting	2.0	2.0	0.0	
IEC9004	20 E Theory and Practice of Big Data Analysis	2.0	2.0	0.0	
IEC9003	21 E Innovation, Business and Patent	2.0	2.0	0.0	
IEM0422	22 Industry Skill of High-Tech	2.0	2.0	0.0	
IEM0425	23 Market Analytics	2.0	2.0	0.0	

Course Code		Course Name	Credit(s)	Credit Unit		Note
				Lecture Hour	Lab/Practice Hour	
IEM0331	24	Marketing on Small and Medium Enterprise	2.0	2.0	0.0	
IEM0332	25	Information and Communication Technology	2.0	2.0	0.0	
IEM0341	26	Analysis of Advanced Industry	3.0	3.0	0.0	
IEM0096	27	The Study in Enterprise Management	3.0	3.0	0.0	
IEC8009	28	Decision Theory and Analysis	3.0	3.0	0.0	
IEC8011	29	New Product Planning and Analysis	3.0	3.0	0.0	
IEC9005	30	E Customer Relationship Management	2.0	2.0	0.0	
IEM0427	31	Business Analytics	3.0	3.0	0.0	
IEM0428	32	Quality Management for Organizational Excellence	2.0	2.0	0.0	
IEM0430	33	Six Sigma Management	2.0	2.0	0.0	
IEM0429	34	Supply Chain Management	2.0	2.0	0.0	
IEM0426	35	Patent Analysis and Management	2.0	2.0	0.0	
IEC8016	36	Research on the Development of Industries through Artificial Intelligence	3.0	3.0	0.0	
IEM0334	37	Enterprise Practice	1.0	0.0	2.0	
IEC0031	38	Application and Development of Nanotechnology	3.0	3.0	0.0	
IEM0053	39	Mechanical Properties of Metal	3.0	3.0	0.0	
IEM0193	40	Engineering Material	3.0	3.0	0.0	
IEM0372	41	Application of Renewable Energy	3.0	3.0	0.0	
IEM0421	42	Solar Cells and Systems	3.0	3.0	0.0	
IEM0364	43	Computer-aided Design and Analysis	3.0	3.0	0.0	
IEM0336	44	Processes of Materials Engineering	3.0	3.0	0.0	
IEM0131	45	Control System Design	3.0	3.0	0.0	
IEM0061	46	Advanced Heat Transfer	3.0	3.0	0.0	
IEC8017	47	Entrepreneurship Management	2.0	2.0	0.0	

IV. Free Elective Credits

A Free Elective Credit for Technical and Vocational Education area, 8.0 credits are required

B Free Elective Credit for Technology Application and Management area, 4.0 credits are required