



**Pittsburg State University**

**College of Technology**

**Master of Science in Technology [Emphasis] (MST)**

**Track 2 - Internship Track 2018-2019**

**CORE COURSES (15):**

One course from each core area is required (15 hours total):

<b>Research</b>	GRT 891	Research Methods in Technology	or	
	TTED 891	Methods of Research	or	
	HRD 891	Methods of Research		3 hrs
<b>Statistics-Based Analysis</b>	ETECH 899	Quantitative Decision Making	or	
	TTED 887	Data Analysis and Interpretation		3 hrs
<b>Quality Systems</b>	ETECH 804	Quality: Management & Control		3 hrs
<b>Global Issues</b>	TE/GRT 750	Technology & Society		3 hrs
<b>Leadership</b>	HRD 804	Fundamentals of Frontline Supervision/Leadership course		<u>3 hrs</u>
<b>TOTAL</b>				<b>15 hrs</b>

**TRACK 2: INTERNSHIP TRACK WITH ELECTIVE (8):**

Eight (8) hours from this section (GRT 700 and 799 are required).

<b>Internship</b>	GRT 700	Internship for Technologist (required)		3 hrs
<b>Professional Development</b>	GRT 799	Professional Development for Technologist (required)		2 hrs.
		and select 3 hours from the following electives:		
	GRT 800	Internship for Technologist		
	HRD 879	Professional Presentations		
	ETECH 831	Value Engineering		
	ETECH 809	Engineering Project Management		
		or an approved graduate <b>technical</b> or <b>professional</b> elective		3 hrs
<b>TOTAL</b>				<b>8 hrs</b>

**EMPHASIS COURSES (Representative courses listed. Select one emphasis area of 9 hours):**

**Automotive Technology Emphasis**

AT 879	Emerging & Future Power in Trans'n	3hrs
AT 890	Tran'n Industry Service Management	3 hrs
AT 795	Special Topics in Automotive	3-6 hrs
	Automotive Approved Electives	3-6 hrs
	<b>Total</b>	<b>9 hrs</b>

**Construction Management Emphasis:**

CMCET 833	Estimating and Bidding Strategy	3 hrs
CMCET 834	Advanced Construction Mgmt	3 hrs
CMCET 836	Virtual Design and Construction	3 hrs
	Construction Approved Elective **	3-9 hrs
	<b>Total</b>	<b>9 hrs</b>

**Graphics Management (or Design) Emphases:**

GIT 810	Special Topics	3 hrs
GIT 880	Graphics Administration (Mnt Only)	3 hrs
GIT 890	Graphics Arts Seminar	3 hrs
	Approved Graphics Design or Mngmt Electives **	3 hrs
	<b>Total</b>	<b>9 hrs</b>

**Personnel Development Emphasis:**

HRD 796	Foundations of HRD	3 hrs
HRD 706	Personnel Development	3 hrs
	Approved Personnel HRD Electives **	3-9 hrs
	<b>Total</b>	<b>9 hrs</b>

**Technology Management:**

ETECH 899	Quantitative Decision Making	3 hrs
ETECH 809	Engineering Project Mngmnt	3 hrs
	Tech Management Approved Electives **	3-6 hrs
	<b>Total</b>	<b>9 hrs</b>

**Information Technology Emphasis (select 9 hrs):**

CIS 615	Database Management (Fall/SP)	3 hrs
CIS 640	Software Engineering (SP only)	3 hrs
	Approved computer /data analytics course(s)	3-9hrs
	<b>Total</b>	<b>9 hrs</b>

**No Emphasis:**

	Approved Graduate Technology Electives**	9 hrs
	<b>Total</b>	<b>9 hrs</b>

**ASSESSMENT**

<b>MST Comp Exam</b>	GRT 895	MST Graduate Review and Assessment		1 hr
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\*\* Advisor approved, see back

**TOTAL DEGREE REQUIREMENTS: Minimum of 33 hrs**

\*\*NOTE: The information contained herein is intended for the use of planning of a student's academic program and does not replace the university catalog.

# Master of Science in Technology [Emphasis] (MST)

## CORE COURSES

- GRT 891. Methods of Research.** 3 hours. Fundamental principles and techniques of research, which include the development of a research proposal. (OR)
- HRD 891. Methods of Research.** 3 hours. Methods and techniques of research, interpretation, evaluation, and use of research. Emphasizes analysis of problems, development of a research plan and completing a literature review. (OR)
- TED 891. Methods of Research.** 3 hours. Required of all candidates for a Masters of Science degree with a major in technical teacher education. Involves the fundamental principles and techniques of research. Option I students submit a paper representing careful investigation and reporting on an approved problem.
- GRT 887. Statistical Applications in Technology Research.** 3 hours. An applied statistics course providing introduction to data gathering and analysis with an emphasis on problem solving for decision making and process improvement in industrial and business settings. Statistical software is used to supplement data analysis and aid in problem solving. Topics covered may include graphic and verbal representation of data, measures of central tendency, confidence intervals, correlation, and linear regression. (OR)
- TTED 887. Data Analysis and Interpretation in Technology.** 3 hours. This is an applied statistics course that utilizes a common statistical software titled SPSS. This course is designed for individuals within the area of technology. The course content consists of determining levels of measurement, measures of central tendency and variability, creating and using an SPSS data base, graphic and verbal representation of data, relationships between variables, running and analyzing differences between parametric and nonparametric populations, and simple linear regression. (OR)
- ETECH 899. Quantitative Decision Making in Industry.** 3 hours. Methods of utilizing quantitative techniques in production planning, manufacturing engineering, quality control and product marketing for modern industry.
- ETECH 804. Quality: Management & Control.** 3 hours. The use of advanced statistical process control techniques. Total Quality Management (TQM), ISO:9000 concepts and procedures, Design of Experiments (DOE), and process optimization using computer applications. Prerequisite: A working knowledge of statistical process control and computers or permission of instructor.
- GRT 801. Interdisciplinary Perspectives in Technology.** 3 hours. An overview of technology from an interdisciplinary perspective; to increase the awareness of other programs, the culture of American Business and other academic disciplines
- TE 750. Technology and Society.** 3 hours. The influence of technology on society is examined. Social-cultural impacts in regard to communication, medicine, transportation, construction, manufacture of goods and services are presented. Discussion centers on ethical, environmental, and societal issues resulting from technological development and decisions regarding it.
- HRD 804. Fundamentals of Frontline Supervision [Leadership].** 3 hours. Supervisory and leadership procedures used by experienced supervisors in business and industry, including current practices and innovative techniques.

## ENRICHMENT AND EMPHASIS ELECTIVE COURSES (Partial Listing)

### Enrichment Electives-Product/Project Improvement\*

- ETECH 807. Systems Engineering & Analysis.** 3 hours. A systems approach to product/project design. System design process from needs identification through conceptual and detail design, product/project development, systems testing and evaluation. Operational and economic feasibility, reliability, maintainability, supportability. Consideration of various project/product design aspects (mechanical, thermal, electrical/electronic, aesthetic, safety, etc.).
- ETECH 809. Engineering Project Management.** 3 hours. The design and control of technologically based projects. Considering theoretical and practical aspects of systems models, organizational development, project planning & control, resource allocation, team development, quantitative and qualitative decision making, financial and legal issues.
- ETECH 831. Value Engineering.** 3 hours. Value engineering concepts, function analysis system techniques (FAST) diagramming, creativity, matrix evaluation, design to cost, life cycle costing, human relations and strategies for organizing, performing and implementing value engineering work.

### Personnel Development Emphasis \*

- HRD 879. Professional Presentations.** 3 hours. Formal and informal presentations for audiences in various industrial and organizational settings. Needs assessment, effective presentation techniques, and audience interaction and engagement.
- HRD 706. Personnel Development in Business and Industry.** 3 hours. Techniques for improving employee learning and performance from analysis and selection through relationships and rewards.
- HRD 796. HRD Foundations and Applications.** 3 hours. Foundation principles, theories, principles, functions and roles associated with employee development, education, and performance in business and industry. (Student successfully completing HRD 596 Introduction to Human Resource Development is not eligible to enroll in HRD 796.)

### Automotive Emphasis\*

- AT 795. Special Topics in Automotive Technology (\_\_\_\_).** 1-3 hours. Selected topics in automotive technology. Regularly scheduled classroom and laboratory study pertaining to a distinct body of technical knowledge. May be repeated if subject matter is different. May be taken on a pass-fail basis.
- AT 879. Emerging and Future Power Systems for Automotive.** 3 hours. Advanced technologies including gasoline and diesel electric hybrid drive systems and integrated systems with multiple power sources, including high voltage systems, high voltage batteries, fuel cells and safety procedures. Prerequisites: AT 112 Engine Analysis, AT 215 Automotive Electrical/Electronic Equipment and AT 216 Automotive Electrical/Electronic Equipment Laboratory, or permission of instructor.
- AT 890. Transportation Industry Service Management and Product Support.** 3 hours. This course will examine the role of service management and product support and will focus on service operations including physical and manpower resources, workflow, customer relations, and employee relations. A look at merchandising and selling service and legal issues and responsibilities are covered. Other topics include management styles, management strategies, financial measurement and marketing.

### Construction Emphasis\*

- CMCET 833. Estimating and Bidding Strategy.** 3 hours. (3 hours lecture). Strategy of contracting to maximize profit through overhead distribution, breakeven analysis, probability and statistical technique, a realistic risk and uncertainty objective, and bid analysis both in theory and in practice. Prerequisites: CMCET 631 Construction Estimating I and 639 Construction Estimating II or equivalent, graduate standing.
- CMCET 834. Advanced Construction Management.** 3 hours. (3 hours lecture). Existing and emerging systems for designing, planning, and construction of projects. Changing roles, relationships, and responsibilities of the parties involved. Time-cost relationships for various construction operations.
- CMCET 835. Advanced Construction Structures.** 3 hours. (3 hours lecture). Methods of analysis for framed structures, trusses, rigid frames, statically indeterminate structures, composite materials. Two-dimensional and three-dimensional finite element analysis.
- CMCET 836. Virtual Design and Construction.** 3 hours. Utilization of 3D/4D/5D construction software applications to develop construction models, evaluate costs, develop schedules and predict better project outcomes. Course content will include the use of Revit, Navisworks, Civil 3D, DProfiler and other current software used in the development of virtual construction models. Prerequisite or co-requisite: CMCET 833 Estimating and Bidding Strategy or CMCET 834 Advanced Construction Management.

### Graphics Design/Management Emphasis\*

- GIT 810. Special Topics (\_\_\_\_).** 1-3 hour. Selected topics in graphics and imaging. Each class limited to single topic. May be repeated if subject matter is different. Prerequisite: Permission of the instructor.
- GIT 880. Graphics Administration.** 3 hours. Graphics management and production problems. Interpersonal relationships, communication skills, and change theory. Addresses the function of upper level management. Spring only class.
- GIT 890. Graphic Arts Seminar (\_\_\_\_).** 1-6 hour. Graphic arts industry, materials, production and processes. Individual reports and group discussions. May be repeated if subject matter is different for a maximum of six hours.

## ASSESSMENT COURSE

- GRT 895. MST Graduate Review and Assessment. 1 hour.** Course provides comprehensive review of candidate's core courses and emphasis area for the Master of Science with a major in Technology (MST) degree in preparation for MST Comprehensive Exam. Comprehensive exam is administered late in the semester as part of the course.

\*Note: Appropriate courses in the College of Technology at the 500 or 600 level (a maximum of 6 hours), may be acceptable with appropriate approvals for each emphases or enrichment. Note: Innovation Engineering Emphasis courses are not shown in listing since it is available face-to-face only.