

# Auto Restoration Technology Program

## Purpose Statement

The department of technology commits itself to developing whole persons through experiential problem solving and the systematic study of technology.

The department achieves this purpose when its students:

- Demonstrate awareness of how technology changes and interacts with society.
- Possess a professional orientation for employment or advanced programs, or develop vocational interests in technology.
- Have acquired technical skills and craftsmanship through systematic study, experiences with technological artifacts, and the solving of technical problems.

## Technology Major

McPherson College offers a unique degree program of authentic auto restoration technology emphasizing hands-on skills and historical research. This program results in a unique departmental blend of contemporary technology and traditional craftsmanship. The Bachelor of Science in Technology major has six different options from which to choose:

## Historic Automotive Technology Option

The goal of the Historic Automotive Technology option is to develop graduates who are prepared for professional pursuits in the area of automotive history and/or graduate study.

### Program objectives (Option I)

This program achieves its purposes when graduates:

- Demonstrate an understanding of the major technological systems of the automobile.
- Demonstrate an understanding of authentic antique automobile restoration materials, methods and techniques.
- Demonstrate proficiency in the use of the materials and tools necessary to complete authentic automobile restoration work.
- Demonstrate the attitudes, knowledge and skills necessary to pursue a successful career in antique automobile restoration.
- Possess knowledge of historical automotive research material sources, methods and techniques necessary to complete historically accurate automotive restorations.
- Demonstrate knowledge of the historical role of the automobile in modern society.
- Demonstrate knowledge of the role of the automobile in the history of transportation, technology and science.

## Requirements

### *Auto Restoration Technology Core Courses*

- TE 100** Intro to Restoration (2 hours)
- TE 141** Engine Rebuilding (4 hours)
- TE 145** Drive Train Rebuilding (4 hours)
- TE 152** Sheet Metal Restoration (4 hours)
- TE 162** Technical Woodworking (OR)
- TE 262** Machining Technology (3 hours)
- TE 202** Research & Documentation (2 hours)
- TE 271** Chassis Restoration (3 hours)
- TE 275** Automotive Paint Restoration (4 hours)
- TE 281** Automotive Trim (4 hours)
- TE 360** Electrical and Electronic Systems (4 hours)
- TE 385** Restoration Assembly Processes (4 hours)

### *History Core Courses*

- G-HI130** Introd. Mthds. For Hist. Analysis (3 hours)
- HI 205** History of the Automobile (3 hours)
- G-HI/TE 333** Technology & Society (3 hours)
- HI 410** Colloquium in Historiography (3 hours)
- \*HI 475** Senior Thesis (2 hours)

### *History Electives*

At least 6 credit hours drawn from the following list:

- AR/HI 245** The History of Automotive Design (3 hours)

**G-HI 150** American History since 1877 (3 hours)

**G-HI 220** Modern Europe (3 hours)

**G-HI 236** Topics in Social History (3 hours)

**G-HI 237** Topics in Political History (3 hours)

**HI 313** Medieval Europe (3 hours)

**HI 315** Early Modern Europe (3 hours)

## Automotive Restoration Management Option

The goal of the Automotive Restoration Management option is to develop graduates who are prepared for professional pursuits and/or graduate study.

### Program Objectives (Option II)

This program achieves its purposes when its graduates:

- Demonstrate an understanding of the major technological systems of the automobile.
- Demonstrate an understanding of authentic antique automobile restoration materials, methods and techniques.
- Demonstrate proficiency in the use of the materials and tools necessary to complete authentic automobile restoration work.
- Demonstrate the attitudes, knowledge and skills necessary to pursue a successful business career in antique automobile restoration.
- Capitalize on Automotive Restoration Technology program connections with automotive business to place students in productive internships.
- Demonstrate knowledge, understanding, and application of the principles, concepts, and tools in each key content area of their major.
- Perform research, analysis, and critical thinking necessary to integrate key content from various business disciplines and other dimensions of society.
- Perform effectively in groups.
- Persuasively communicate business-related ideas in a variety of media and settings.

### Requirements

#### *Automotive Restoration Technology Core*

**HI 205** History of the Automobile (3 hours)

**TE 100** Intro to Restoration (2 hours)

**TE 162** Technical Woodworking (OR)

**TE 262** Machining Technology (3 hours)

**TE 141** Engine Rebuilding (4 hours)

**TE 145** Drive Train Rebuilding (4 hours)

**TE 152** Sheet Metal Restoration (4 hours)

**TE 202** Research & Documentation (2 hours)

**TE 271** Chassis Restoration (3 hours)

**TE 275** Automotive Paint Restoration (4 hours)

**TE 281** Automotive Trim (4 hours)

**TE 385** Restoration Assembly Processes (4 hours)

37 hours

#### *Business Management Courses*

**G-BA 101** Introduction to Business (3 hours)

**EC 202** Survey of Economics (3 hours)

**AC 205** Financial Accounting (3 hours)

**AC 206** Managerial Accounting (3 hours)

**BA 224** Principles of Management (3 hours)

**BA 325** Financial Management I (3 hours)

**BA 235** Small Business Management (3 hours)

**BA 315** Business Law (3 hours)

**BA 321** Marketing (3 hours)

**\*BA 339** Human Resources Management (3 hours)

**BA 375** Junior Seminar (1 hour)

**\*BA 475** Business Strategy and Policy (3 hours)

34 hours

71 hours in major

## Automotive Communication Option

The goal of the Automotive Communications Major Option is to develop graduates who have the skills and technical knowledge to communicate effectively in a variety of media to an audience focused on automotive issues.

### Program Objectives (Option III)

This program achieves its purposes when its graduates:

- Demonstrate knowledge of methods and techniques necessary to complete and document historically accurate automotive restorations.
- Demonstrate knowledge of the historical role of the automobile in modern society and of historical automotive research material sources.
- Demonstrate oral and written communication skills necessary to pursue a successful career in automotive communication, publishing or other media.
- Design attractive, effective documents, graphics, and publications targeted at specific audiences.
- Understand the media of communication, including mass media and computer technologies.
- Make ethical choices in their professional lives.

### Requirements

#### *Automotive Restoration Technology Core Courses*

**HI 205** History of the Automobile (3 hours)  
**TE 100** Intro to Restoration (2 hours)  
**TE 162** Technical Woodworking (OR)  
**TE 262** Machining Technology (3 hours)  
**TE 141** Engine Rebuilding (4 hours)  
**TE 145** Drive Train Rebuilding (4 hours)  
**TE 152** Sheet Metal Restoration (4 hours)  
**TE 202** Research & Documentation (2 hours)  
**TE 271** Chassis Restoration (3 hours)  
**TE 275** Automotive Paint Restoration (4 hours)  
**TE 281** Automotive Trim (4 hours)  
**TE 385** Restoration Assembly Processes (4 hours)  
37 hours

#### *Communication Core Courses*

Students must complete the listed courses from the core communication curriculum and the listed courses from the multimedia communication emphasis.

#### *Communications Core*

**G-CM 120** Intro to Human Communication (3 hours)  
**CM 135** Journalism (3 hours)  
**G-CM 140** Public Speaking (3 hours)  
**CM 210** Multimedia Storytelling I (3 hours)  
**G-CM 221** Intercultural Communication (3 hours)  
**CM 305** Editing (OR)  
**CM 310** Public Relations (3 hours)  
**CM 315** Journalism Practica (3 hours)  
**CM 375** Junior Seminar (1 hour)  
**CM 388** Career Conn. in Communication (OR)  
**TE 388** Career Conn. In Technology (3 hours)  
**CM 475** Seminar in Communication (2 hours)  
**\*EN 313** Expository Writing (OR)  
**EN 420** Creative Writing (3 hours)  
30 hours

*67 hours in major*

## Automotive Restoration Design Technology Option

The Automotive Restoration Design Technology option is for the student who wishes to pursue a career in automotive art. This option will develop majors who possess the technical knowledge and artistic abilities necessary to execute a variety of art skills sensitively and intelligently, analyze and critique art, and relate the creative process to life in personally meaningful ways.

This degree option within the technology and art departments is oriented to meet the needs of students who (1) wish to develop and refine their aesthetic

values (2) plan for careers as automotive artists (3) plan to further their art education in graduate school.

## Program Objectives (Option IV)

This program achieves its purposes when its graduates:

- Demonstrate an understanding of the major technological systems of the automobile.
- Demonstrate an understanding of authentic antique automobile restoration materials, methods and techniques.
- Demonstrate proficiency in the use of the materials and tools necessary to complete authentic automobile restoration work.
- Possess knowledge of historical automotive research material sources, methods and techniques necessary to complete and document historically accurate automotive restorations.
- Demonstrate knowledge of the historical role of the automobile in modern society.
- Demonstrate knowledge of the role of the automobile in the history of transportation, technology and science.
- Demonstrate the attitudes, knowledge and skills necessary to pursue a successful career in automotive art using a variety of media.
- Demonstrate performance in a variety of art media.
- Demonstrate analysis and critique in verbal and written form.
- Demonstrate an understanding of design principles and elements.
- Demonstrate awareness of Western and non- Western cultural contributions to art.
- Demonstrate meaningful connections of art to life through the development of keen perceptual abilities.

## Requirements

### *Automotive Restoration Technology Core Courses*

**HI 205** History of the Automobile (3 hours)  
**TE 100** Intro to Restoration (2 hours)  
**TE 110** Technical Drawing/CAD (3 hours)  
**TE 141** Engine Rebuilding (4 hours)  
**TE 145** Drive Train Rebuilding (4 hours)  
**TE 152** Sheet Metal Restoration (4 hours)  
**TE 162** Technical Woodworking (OR)  
**TE 262** Machining Technology (3 hours)  
**TE 202** Research & Documentation (2 hours)  
**TE 271** Chassis Restoration (3 hours)  
**TE 275** Automotive Paint Restoration (4 hours)  
**TE 281** Automotive Trim (4 hours)  
**TE 385** Restoration Assembly Processes (4 hours)  
37 hour

### *Art Core Courses*

**G-AR 101** Drawing I (2 hours)  
**G-AR 102** Painting I (2 hours)  
**AR 103** Elementary Design (3 hours)  
**AR 202** Painting II (2 hours)  
**AR 203** Photography I (2 hours)  
**AR 230** Graphic Design I (3 hours)  
**AR/HI 245** The History of Automotive Design (3 hours)  
**G-AR 311** Art History II (4 hours)  
**AR 348** Intermedia (3 hours)  
**AR 475A** Senior Concentration (4 hours)  
38 hours

*69 hours in major*

### *Automotive Restoration Design Major Internship/Field experience (recommended):*

**TE 295/495** Field Experience (work experience in automotive Art/Design) (OR) (1 - 4 hours)  
**TE 388** Career Connections (Internship in automotive Art/Design) (1 - 12 hours)  
1-12 hours total

## Automotive Restoration Technology Option

The Automotive Restoration Technology option is for the student who intends to pursue the authentic restoration of vintage and classic vehicles and develop values of craftsmanship, with attention to detail and an emphasis on authenticity. Graduates will be able to reference a wide variety of processes, methods and will have research capabilities. Graduates will be able to understand the automobile as a technological system and understand its

development and role in the world.

## Program Objectives (Option V)

This program achieves its purposes when its graduates:

- Demonstrate an understanding of the major technological systems of the automobile.
- Demonstrate an understanding of authentic antique automobile restoration materials, methods and techniques.
- Possess knowledge of historical automotive research material sources, methods and techniques necessary to complete and document historically accurate automotive restorations.
- Demonstrate proficiency in the use of the materials and tools necessary to complete authentic automobile restoration work.
- Demonstrate the attitudes, knowledge and skills necessary to pursue a successful business career in antique automobile restoration.
- Demonstrate knowledge of the historical role of the automobile in modern society.
- Demonstrate knowledge of related and supporting scientific fields.

## Requirements

### *Automotive Restoration Technology Core Courses*

- HI 205** History of the Automobile (3 hours)
- TE 100** Intro to Restoration (2 hours)
- TE 141** Engine Rebuilding (4 hours)
- TE 145** Drive Train Restoration (4 hours)
- TE 152** Sheet Metal Restoration (4 hours)
- TE 162** Technical Woodworking (3 hours)
- TE 202** Research & Documentation (2 hours)
- TE 262** Machining Technology (3 hours)
- TE 271** Chassis Restoration (3 hours)
- TE 275** Automotive Paint Restoration (4 hours)
- TE 281** Automotive Trim (4 hours)
- TE 301** Materials and Processes (3 hours)
- TE 360** Electrical & Electronic Systems (4 hours)
- TE 375** Junior Seminar (1 hour)
- TE 385** Restoration Assembly Processes (4 hours)
- TE 475** Senior Project (4 hours)

*6 credit hours from the following upper-level courses:*

- TE 341** Advanced Engine Rebuilding (3 hours)
- TE 452** Advanced Sheet Metal Restoration (3 hours)
- TE 480** Advanced Automotive Paint Restoration (3 hours)
- TE 481** Applied Trim and Upholstery (3 hours)

*3 credit hours from the following courses:*

- TE 252** Vintage Panel Restoration (3 hours)
- TE 242** Re-Babbitting (spring - on demand) (3 hours)
- TE 353** Finishing Touches (3 hours)
- TE 380** Applied Diagnostics (3 hours)
- TE 388** Internship (3 hours)

*60 hours in major*

## Recommended Supporting Courses:

- AR/HI 245** The History of Automotive Design (3 hours)
- G-BA 101** Intro to Business (3 hours)
- G-CH 101** Principles of General Chemistry (4 hours)
- G-PH 215** General Physics (4 hours)
- TE 110** Engineering Drawing/CAD (3 hours)

## Motorcycle Restoration Technology Option

Motorcycle Restoration Technology is the option for the student who intends to pursue the authentic restoration of vintage and classic motorcycles and to help develop values of craftsmanship, with attention to detail and an emphasis on authenticity. Graduates will not only possess a wide range of knowledge of the processes necessary to complete the restoration but have the research skills to ensure an accurate and authentic restoration. Graduates will

understand the technical systems of the motorcycle as well as its role in society and the world of transportation.

### Program Objectives (Option VI)

This program achieves its purposes when its graduates:

- Demonstrate an understanding of the major technical systems of the motorcycle.
- Demonstrate an understanding of authentic antique and vintage motorcycle restoration materials, methods and techniques.
- Possess knowledge of historical motorcycle research material sources, methods and techniques necessary to complete and document historically accurate motorcycle restorations.
- Demonstrate proficiency in the use of the materials and tools necessary to complete authentic motorcycle restoration work.
- Demonstrate the attitudes, knowledge and skills necessary to pursue a successful business career in antique and vintage motorcycle restoration.
- Demonstrate knowledge of the historical role of the motorcycle in modern society.

### Requirements

**TE 206** Motorcycle History and American Society (3 hours)

**TE 100** Intro to Restoration (2 hours)

**TE 141** Engine Rebuilding (4 hours)

**TE 145** Drive Train Restoration (4 hours)

**TE 152** Sheet Metal Restoration (4 hours)

**TE 262** Machining Technology (3 hours)

**TE 271** Chassis Restoration (3 hours)

**TE 275** Automotive Paint Restoration (4 hours)

**TE 281** Automotive Trim (4 hours)

**TE 360** Electrical & Electronic Systems (4 hours)

**TE 385** Restoration Assembly Processes (4 hours)

**TE 341** Motorcycle Engines (3 hours)

**TE 371** Motorcycle Chassis & Drive Train (3 hours)

**TE 384** Motorcycle Assembly Processes (3 hours)

**TE 375** Junior Seminar (Restoration) (1 hours)

**TE 475** Senior Project (4 hour)

*Choice of one advanced course: 3 hours*

**TE 452** Advanced Sheet Metal Restoration – with Motorcycle Option

**TE 480** Advanced Paint – with Motorcycle Option

**TE 481** Applied Trim & Upholstery – with Motorcycle Option

*Choice of one of the following courses: 3 hours*

**TE 353** Finishing Touches (3)

**TE 301** Materials and Processes (3)

**TE 380** Applied Diagnostics (3)

**TE 388** Internship

*61 hours in major*

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## Auto Restoration Technology Course Descriptions

### TE 100 Intro To Restoration

*2 hours*

A course designed to provide an overview of the restoration core courses, elective courses, general safety and shop knowledge. This course will provide historical information about the automotive industry, information about research, documentation and planning a restoration project. Students must pass this course with a D or better to continue with courses with a TE prefix. Prerequisites: None. (Fall)

### TE 110 Engineering Drawing/CAD

*3 hours*

This course blends the art and science of freehand sketching and technical drafting as students are introduced to the graphic languages as a

medium of technical communication. Topics include freehand (isometric) sketching and traditional (orthographic) drafting as well as an introduction to two and three dimensional CAD (Computer Assisted Drawing) tools and processes. Prerequisites: TE 100, None. Spring, odd years

#### **TE 141 Engine Rebuilding**

*4 hours*

A course designed to teach students the basics of automotive engine restoration. This course includes work in basic engine and related systems, operational theory, disassembly procedures, diagnosis of mechanical faults, evaluating engine condition, engine rebuilding techniques and engine machining processes. Students will work on vintage automobile engines, rebuilding engine components as determined by the instructor. Lab Fee. Prerequisite: TE 100, TE 262 taken concurrently or consent of the instructor. (Fall, Spring)

#### **TE 145 Drive Train Rebuilding**

*3 hours*

A course designed to teach students the basics of automotive drive train restoration. This course includes work in basic transmission and differential operational theory, disassembly procedures, diagnosis of mechanical faults and evaluating transmission and final drive condition, transmission and differential rebuilding techniques and procedures. Students will work on vintage automobile transmissions and differential assemblies as determined by the instructor. Lab Fee. Prerequisite: TE 100. (Fall, Spring)

#### **TE 152 Sheet Metal Restoration**

*4 hours*

A course designed to teach students the basics of welding and auto body panel fabrication as used in automobile restoration. This course includes work in basic welding processes, techniques, operational theory and related systems and basic auto body panel fabricating processes, techniques, tool operational theory and related fabrication systems, assembly procedures for auto body panels, and evaluating metal body component condition. Lab Fee. Prerequisite: TE 100. (Fall, Spring)

#### **TE 162 Technical Woodworking**

*3-4 hours*

This course will introduce students to the concepts and practices of basic woodworking, including planning, fabrication and finishing, while stressing the safe operation of power tools used in basic woodworking. The course will also examine the history and evolution of the American automobile in general and automotive coach building in particular. Prerequisite: TE 100. Lab Fee. (Fall, Spring)

#### **TE 202 Research & Documentation**

*2 hours*

This course will introduce students to practical research, documentation and planning related to restoring antique automobiles. Prerequisite: TE 100. (Fall)

#### **TE 206 Motorcycle History and American Society**

*3 hours*

A study of the evolution of motorcycle culture, and the impact of that culture on American society. Prerequisite: TE 100. (Fall, odd years)

#### **TE 242 Re-Babbitting**

*3 hours*

An intensive, lab-based course in the restoration and re-Babbitting of antique automotive engines and mechanical components. Lab Fee. Prerequisites: TE 100, TE 141, TE 262. (On Demand)

#### **TE 245 The History of Automotive Design**

*3 hours*

Discover and examine the technological and stylistic evolution of automotive design. This course will explore ways in which automobiles, by way of their design, reflect the technology and communicate the values of the culture that produced them. Prerequisites: TE 100. (Spring)

#### **TE 252 Vintage Panel Restoration**

*3 hours*

An intensive, lab-based course in the restoration or fabrication of antique auto body panel components (not applicable as an advanced course). Lab Fee. Prerequisites: TE 100, TE 152. (Interterm)

#### **TE 262 Machining Technology**

*3 hours*

An introduction to machining technology. Students are introduced to blueprint reading, precision measurement, the theory and operation of machine tools, layout techniques and the use of layout tools, the characteristics of common industrial metals used in machining processes, machine maintenance, and nontraditional machining processes. Lab work required. Lab Fee. Prerequisite: TE 100. (Fall, Spring)

**TE 271 Chassis Restoration**

4 hours

A course designed to teach students the basics of automotive chassis restoration. This course includes restoration work in basic frame, suspension, wheel, brake and drive train components. Operational theory and other related chassis systems, disassembly procedures, diagnosis of mechanical faults, component condition, and brake systems machining processes are also included. Students will work on vintage automobile chassis and related components. Lab Fee. Prerequisite: TE 100, TE 141, TE 145. (Fall, Spring)

**TE 275 Automotive Paint Restoration**

4 hours

A course designed to teach students the basics of automotive paint restoration. This course emphasizes panel preparation, paint systems and paint application, disassembly and documentation procedures, diagnosis of auto body and interior painted surface faults and evaluating the auto body condition. Students will work on vintage automobile bodies and related components. Lab Fee. Prerequisite: TE 100. (Fall, Spring)

**TE 281 Automotive Trim**

4 hours

A course designed to teach students the basics of automotive trim (upholstery) restoration. This course includes restoration work in basic automotive seats, interior panels, convertible and other top covering restoration. Also included are disassembly procedures, diagnosis of upholstery and trim and interior faults and evaluating the interior condition. Students will work on vintage automobile interiors and related components. Lab Fee. Prerequisite: TE 100. (Fall, Spring)

**TE 301 Materials and Processes**

3 hours

This course will explore the history and cultural impacts of the development of engineering materials and processes. Students will gain a working knowledge of the properties and strengths of materials and gain a working knowledge of classic industrial processes and be able to apply that knowledge to the restoration and preservation of antique automotive systems and structures. This class will include field trips to various industrial facilities.. Lab Fee. Prerequisites: None. (Interterm.)

**TE 311 Advanced Topics in Engineering Drawing/CAD**

4 hours

A continuation of TE 110. Includes revolutions, tolerance dimensioning, threads and fasteners, sections, working drawings, surface and solid generation. Prerequisite: TE 100, TE 110. (On demand)

**G-TE/HI 333 Technology and Society**

3 hours (Language Intensive)

An introduction to the historical development of technology as part of society and culture, exploring the ways which society and culture constrain and stimulate technologies, and the ways in which technology then shapes society and culture. Does not require previous specialized technical knowledge. This course is designed for both majors and non-majors. Prerequisite: G-EN 111 or consent of the instructor. (Fall.)

**TE 341 Advanced Engine Rebuilding**

3 hours

This course is designed to build on the skills and knowledge gained in TE 141. This class will focus on designs and construction techniques which apply specifically to vintage engines. This class will also explore the practical application of techniques gained in TE 141 to more complex and vintage engines. Repairing damaged or severely worn components will be the focus of one major Rebuilt engines will then be tested on a dynamometer to assess the rebuild. Lab Fee. Prerequisites: TE 100, TE 141, TE 262. (Fall)

**TE 342 Motorcycle Engine Rebuilding**

3 hours

This course will focus on rebuilding single and multi-cylinder engines used in motorcycles prior to 1970 as well as various other small engines of similar design. Lab Fee. Prerequisite: TE 100, TE141 (Spring)

**TE 353 Finishing Touches**

3 hours

A course designed to teach three skills needed for the restoration of early era vehicles. Students will learn to restore and polish hard trim moldings, restore wood grained interior moldings and the art of pinstriping. Lab Fee. Prerequisites: TE 100, TE 152, TE 275 or consent of the instructor. (on demand)

**TE 360 Electrical and Electronic Systems**

4 hours

This course will address the characteristics and operations of electrical and electronic systems with special emphasis on their practical application in automotive systems. The course will introduce Ohm's Law, electrical power, circuit elements and magnetism and induction in electrical circuits. Special emphasis is given to the use of this knowledge in the repair, restoration, and preservation of classic and antique automotive electrical systems. Prerequisite: TE 100, TE 141, TE 271. (Fall, Spring).

#### **TE 371 Motorcycle Drivetrain & Chassis Restoration**

*3 hours*

This course on diagnosing problems, repairing and restoring motorcycle transmissions and chassis components including forks, wheels and tires, and brakes. Lab Fee. Prerequisite: TE 100, TE271 (on demand)

#### **TE 375 Junior Seminar (Juniors, Option V and VI only)**

*1 hour*

This course will explore how to create a professional portfolio, how to properly research restoration, how to manage tasks in relation to a timeline, how to prepare for senior project, and professional ethics. For juniors in Option V and VI only. Prerequisites: TE 100, TE 141, TE145, TE 152 or consent of the instructor, (Fall)

#### **TE 380 Applied Diagnostics**

*3 hours*

An exploration of vintage automotive diagnostics, including a basic overview of automotive electrical systems, fuel and ignition systems, drive train and chassis systems. Basic failure modes of these systems will be explored and will be experienced in the laboratory. Integration of the theory and practice of diagnostics will be explored in a classroom and lab setting. Proper use of diagnostic tools, diagnostic literature and methodology will be taught. Students will work with vintage automobiles and related components. Lab Fee. Prerequisites: TE 100, TE 141, TE 145, TE 271, TE 360. (Interterm)

#### **TE 384 Motorcycle Restoration Assembly Processes**

*4 hours*

A course designed to allow students to refine their skills from other courses in a comprehensive format. Students will work on vintage motorcycles and their components, rebuilding and reassembling these components. Lab Fee. Prerequisite: TE 100, TE 262, TE 275, TE 281, TE 342, TE 371 or consent of the instructor. (Fall)

#### **TE 385 Restoration Assembly Processes**

*4 hours*

A course designed to allow students to refine their skills from other courses in a comprehensive format. Students will work on vintage automobiles and their components, rebuilding and reassembling these components. Hard metal trim restoration and other specialized restoration processes may also be explored depending on project vehicles available. Lab Fee. Prerequisite: TE 100, TE 141, TE 145, TE 152, TE 162, TE 262, TE 271, TE 275, TE 281 or consent of the instructor. (Fall, Spring)

#### **TE 406 Advanced Topics in Woodworking and Design**

*4 hours*

A study of the nature of wood, identification of wood, and joinery. Special emphasis is given to the use of this knowledge in the design, construction, restoration and preservation of automotive coachwork and related wood products. Prerequisites: TE 100, TE 110 and TE 162. Lab fee. (On demand)

#### **TE 414 Advanced Electrical & Electronic Systems**

*3 hours*

A student-guided study of the design, operation, and characteristics of specialized automotive electrical systems including gauges and instruments, clocks and radios, lighting and accessory systems, and specialized ignition systems. This course will address reading and interpreting automotive wiring diagrams and will include design and construction of authentic wiring looms and harnesses. Special emphasis is given in this course to the repair, restoration and preservation of classic and antique automobile electrical systems. Lab Fee. Prerequisites: TE 100, TE 360 (Spring)

#### **TE 452 Advanced Sheet Metal Restoration**

*3 hours*

A study of special sheet metal restoration techniques, including the use of power tools in fabrication, creating complex compound curves, repairing extremely damaged components and the craft of creating custom tooling. Students will build experience and confidence in their skills in the laboratory. Lab Fee. Prerequisites: TE 100, TE 152. (Spring)

#### **TE 475 Restoration Technology Senior Project (Seniors, Option V and VI only)**

*4 hours (Language Intensive)*

This course will be a practical and realistic experience in which students will study a specific aspect of automotive restoration and complete restoration work on one of many college-owned vintage cars or projects related to their study. Students will present the completed research and

restoration plan to complete a capstone experience. Prerequisite: TE 100, TE 375. (Fall)

### **TE 480 Advanced Automotive Paint Restoration**

*3 hours*

This course will build on concepts introduced in TE 275. Safety issues related to painting, paint history, special painting techniques and proper documentation of vehicle components will be a major emphasis. Students will work to increase their painting skills through practical experience. Lab Fee. Prerequisites: TE 100, TE 275. (Fall)

### **TE 481 Applied Trim and Upholstery**

*3 hours*

A course that builds students' hands-on experience in automotive soft trim restoration and replacement. Lab Fee. Prerequisites: TE 100, TE 281. (Spring)

### **Individualized Courses Available**

295/495 Field Experience (1-4 hours)

\*299/499 Independent Study (1-4 hours)

388 Career Connections (1-12 hours)

\*445 Readings and Research (1-4 hours)

### **\* Prerequisite Policy: (TE 299/499 and TE 445)**

The student must submit to the appropriate instructor a written proposal of study, prior to enrollment in the course, including the following components:

1. statement of the student's acceptance of the goals of topics courses: to provide the opportunity for specialized unit shop teaching endorsements, study of advanced content, and the development of teaching and training skills;
2. goals, project plans, and a detailed weekly schedule, consistent with the course syllabus;
3. evidence of academic maturity, self-motivation, and desire to serve as an appropriate role model for students in lower-level classes in similar content area;
4. agreement to schedule the lab time of the topics course at the same time the lower-level course is offered; and
5. evidence that the student has completed all lower-level course(s) in the corresponding content area with a minimum B (3.0) average and a minimum B (3.0) overall college grade point average; or permission of the instructor to waive the grade

Upon instructor approval of the proposal, an interview will be scheduled with the student to discuss the arrangement and any further details prior to granting final permission for the student to enroll in the course.