Raritan Valley Community College
Course Outline

AUTC 106 – Clutches & Manual Transmissions

I. Basic Course Information

A. Course Number and Title: AUTC 106 – Clutches & Manual Transmissions

B. New or Modified Course: Modified

C. Date of Proposal: Fall 2017

D. Effective Term: Fall 2018

E. Sponsoring Departments: *Science and Engineering Department*

F. Semester Credit Hours: 2

G. Weekly Contact Hours: 4 Lecture: 1
Laboratory: 3
Out of class student work per week: 3.5

H. Co-requisite: A grade of C or better in AUTC 101 – Automotive Introduction, Fundamentals, and Safety

I. Laboratory Fees: Yes

J. Name and Telephone Number or Email Address of Department Chair and Divisional Dean at time of approval:
Department Chair: Marianne Baricevic, Marianne.baricevic@raritanval.edu
Divisional Dean: Sarah Imbriglio, sarah.imbriglio@raritanval.edu

II. Catalog Description

Co-requisite: A grade of C or better in AUTC 101 – Automotive Introduction, Fundamentals, and Safety. Fundamental principles and types of clutches and manual transmissions and their component parts are covered. Students will experience the installation and adjustment of clutches, manual transmissions, universal parts and other components such as drive shafts. Diagnosis and service of standard transmissions are included.

In the lab, students will learn a hands-on strategy to perform basic maintenance of manual transmissions, clutches, and drive train and learn how to use a variety of hand tools and precision

measurement tools. Students will be required to wear clothing appropriate for auto shop safety at all classes. Safety glasses will also be required at all classes.

III. Statement of Course Need

A. Automotive technicians are vital to our mobile and transport-dependent community. Understanding the structure and function of manual transmissions, clutches, and drive train systems in automobiles and their maintenance are integral elements for the education of well-trained technicians in the field. Efficiency, performance and compliance with EPA regulations (State and Federal) are mandatory in this field as well as customer satisfaction. This course is intended to enhance the student's knowledge beyond understanding.

B. Lab assignments for the course will introduce students to the basic manual transmissions, clutches, and drive train components of the vehicle, while maintaining instruction that reinforces safety practices in a demonstrative environment.

C. Course transferability: The course transfers one of the core fundamental courses for the Automotive Technology major and includes a laboratory component; for New Jersey schools go to the NJ Transfer website, www.njtransfer.org. For all other colleges and universities, go to their individual websites.

IV. Place of Course in College Curriculum

A. Free Elective

B. This course meets the program requirement for the Automotive Technology Certificate and the Associate of Applied Science in Automotive Technology.

C. Course transferability; for New Jersey schools go to the NJ Transfer website, www.njtransfer.org. For all other colleges and universities go to their individual sites.

V. Outline of Course Content

A. Safety and Driveline Layout
B. Special Tools and Applications
C. General Clutch Construction
D. Gears, Chains, and Bearings
E. Static and Dynamic Sealing
F. Clutch Construction and Operation
G. Clutch Problems, Trouble-Shooting and Service
H. Manual Transmission Construction
I. Manual Transmission Problems, Trouble Shooting and Service
J. Transaxle Construction and Operation

K. Drive Lines Construction and Operation
L. Transfer Cases, Manual and Automatic Construction & Operation 4WD
M. Transfer Cases, Computer Controlled AWD Units
N. Rear Axle Assemblies, Problems, Trouble-Shooting & Service
O. Rear Axle Set-Up & Assembly
P. Prop Shaft and Rear Axle Assemblies
Q. C-V joints and Plunge Joints and bearings: Inspection and Servicing
R. 4WD and AWD Construction and Operation
S. Drive Train Electronics and Controls
T. Visual Inspections of Drivelines

VI. General Educational and Course Learning Outcomes

A. General Educational Learning Outcomes

At the completion of the course, students will be able to:

1. identify techniques to troubleshoot, repair, maintain, and solve problems related to automotive manual transmissions, clutches, and drive train systems (GE NJ 4)
2. apply quantitative reasoning to problems with maintenance of automotive manual transmissions, clutches, and drive train systems (GE NJ 2)
3. discuss issues involving automotive manual transmissions, clutches, and drive train systems (GE NJ 1)

B. Course Learning Outcomes

At the completion of the course, students will be able to:

1. Analyze the structure and function of manual transmissions, clutches, and drive train in use in automobiles.
2. Compare and contrast manual transmissions, clutches, and drive train component systems.
3. Inspect, test, and replace manual transmissions, clutches, and drive train components according to manufacturer's specifications.
4. Examine manual transmissions, clutches, and drive train components and identify appropriate tools and measuring instruments used during diagnosis and repair.
5. Perform lab experiments and tasks to competent skill level as listed on the NATEF curriculum standards.

C. Assessment Instruments

1. lectures
2. demonstrations
3. laboratory work
4. instructional videos/DVDs

5. laboratory performance
6. examinations
7. NATEF task list

VII. Grade Determinants

A. lab performance
B. examinations
C. class participation
D. technical writing
E. interactive simulations

Primary formats, modes, and methods for teaching and learning that may be used in the course:

A. lecture/discussion
B. small-group work
C. group discussion
D. computer-assisted instruction
E. laboratory
F. simulation/role playing
G. demonstration
H. student collaboration

VIII. Text and Materials

A. Suggested Text: Automotive Technology: Principles, Diagnosis, and Service Plus MyAutomotiveLab with Pearson eText -- Access Card Package / Edition 5 by James D. Halderman (Author), Prentice Hall Publishing ISBN-10: 0134009088 / ISBN-13: 9780134009087

B. Students will be required to wear clothing appropriate for auto shop safety at all classes. Student are required to wear a standard industry uniform. Safety glasses will also be required at all classes.

C. The Automotive Program utilizes online curriculum and online industry service and repair information from the following sources:

I. AllData
II. Snap On Industries
III. Shop Key Pro.

D. Various Automotive Magazines

E. Students are provided the use of RVCC technology during the course

Please note: The course outline is intended only as a guide to course content and resources. Do not purchase textbooks based on this outline. The RVCC Bookstore is the sole resource for the most up-to-date information about textbooks.

IX. Resources

A. Reference books
B. AllData
C. Shop Key Pro
D. Snap On Industries
E. NAPA Pro-Link
F. Published Automotive Magazines
G. Lab/Shop Tools and Equipment
H. CDX Interactive Courseware
I. Safety equipment
J. Lubricants and various automotive fluids
K. Sample automotive system components
L. Instructional videos/DVDs
M. Auto mechanics shop facility at RVCC workforce building