Raritan Valley Community College
Course Outline

AUTC 206 – Automatic Transmission & Drive Trains

I. Basic Course Information

A. Course Number and Title: AUTC 206 – Automatic Transmission & Drive Trains

B. New or Modified Course: Modified

C. Date of Proposal: Fall 2017

D. Effective Term: Semester: Fall Year: 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. This course will cover the theoretical understanding of principles, maintenance and adjustments required to today's automatic transmissions, transaxles, drive shafts, final drives and all-wheel drive units.

In the lab, students will learn a hands-on strategy to perform basic maintenance of engines 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 automatic transmission systems in automobiles and their maintenance are integral elements for the education of well-trained technicians in the field. Students need to be familiar with the basic hydraulic principles for all automatic transmissions. Service and adjustments which can be done to the transmissions are a key part of maintenance and life expectancy of the unit.

B. Lab assignments for the course will introduce students to the basic maintenance and repair of automatic transmission systems, while maintaining instruction that reinforces the safety practices in a demonstrative environment.

C. Course transferability: The course transfers as 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. Torque Converters
    i. Torque multiplication
    ii. Fluid flow
    iii. Heat exchanger
    iv. Torque converter lock-up
B. Gear Train, Bands, and Clutches
    i. Planetary gears
    ii. Flex plate and ring gear
C. Safety and Automatic Transmission Construction and Operation
    i. General maintenance

ii. Checking fluid
iii. Locate leaks
iv. Safety precautions for testing transmissions
v. Test driving

D. Basic Hydraulic Operation
i. Pascal's Law
ii. Fluid pump
iii. Solenoid valves
iv. Clutch and band application charts

E. Basic Hydro-Controls
i. Shifting and shift valve controls
ii. Line pressure control
iii. Drive gears

F. Automatic Transmission Service and Simple Repairs
i. In-vehicle repairs
ii. Out-of-vehicle repairs
iii. Transmission mounts
iv. Final drive

G. Automatic Transmission Adjustments
i. Shift linkage

H. Electronically Controlled Transmission
i. Transmission Computer Control Module
ii. Input Sensors
iii. Output Solenoids

I. Hybrid and Continuously Variable Transmissions
i. Types of CVT
ii. Regeneration
iii. Propulsion

J. Automatic Transmission Circuits and Designs

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 appropriate techniques to troubleshoot and solve problems with automatic transmission systems (GE NJ 4)
2. apply quantitative reasoning to problems with the maintenance of automotive systems (GE NJ 2)
3. discuss issues involving automotive 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 automatic transmission systems in use in automobiles.
2. Recognize environmental and safety concerns related to maintenance procedures for automatic transmission systems.
3. Discuss the theory regarding the influence of computer controls on transmission and all-wheel drive systems.
4. Perform lab experiments and tasks to competent skill level as listed on the NATEF curriculum standards.

C. <u>Assessment Instruments</u>

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