



NASHUA COMMUNITY COLLEGE

COURSE OUTLINE FORM

Course Title: Honda Advanced Electrical and Electronic Systems			
Course Prefix & No. HATN 205N	Lecture Hours: 2	Lab Hours: 4	Credit Hours: 4
Department: Industry and Transportation			
Program: Honda Automotive Technology			
Revision Date: 12/2021			

Prerequisites/ Co-requisites:

HATN 113N The designated prerequisite contains skills that will be required and utilized in the Honda Advanced Electricity class.

Required Accuplacer Score: N/A

Entrance Skills:

HATN 113 The designated prerequisite contains skills that will be required and utilized in the Honda Advanced Electricity class. In addition, reading, writing, computational skills and computer skills will be required. Strong skills in reading schematics and understanding how electricity flows will be needed for successful completion of this course.

Catalog Description:

This course is designed to give students a better understanding of the theory, operation, diagnosis and repair practices that are utilized in Honda advanced electrical systems. The topics will include, computer controlled systems, electric motor circuits, computer communication systems, body computers, multiplexing, keyless entry and hybrid systems. In addition, students will be required to complete all Advanced Electrical self study modules, as well as Honda designated skill module for successful completion of this course.

Course Competencies:

Competency (Knowledge and Skills)	Critical Thinking Skills	Linked to Program Outcome(s) #
Students will be able to:		
1. To develop safe working habits and respect for equipment and shop management.	Recognize and apply	
2. Understand the operation of components found in solid state circuitry, such as capacitors, transistors, diodes and resistors.	Identify and apply	
3. Proper knowledge and interpretation of wiring diagrams of computer controlled systems.	Recognize and apply	
4. Diagnose systems with the use of diagnostic test equipment.	Analyze	
5. Understand the basics of multiplex systems.	Recognize	
6. To become proficient at reading wiring diagrams and service manuals.	Recognize, apply and analyze	
7. To build experience and competence in the troubleshooting of electrical problems on vehicles.	Recognize, apply and analyze	
8. Diagnose and repair computer controlled circuits	Employ and Interpret	
9. Understand basic hybrid safety and operation	Knowledge	

Course Outline:

Content Topic	Subtopics (a., b., etc.)
A) Introduction and Shop Safety	<ul style="list-style-type: none">a. Battery safetyb. Electrical safetyc. Hybrid safety
B) Computer Fundamentals	<ul style="list-style-type: none">a. Computer design and operationb. Input and output testing and operationc. Diagnostic procedures
C) Test Equipment	<ul style="list-style-type: none">a. Oscilloscopesb. Graphing Multi-meters
D) Communication Systems	<ul style="list-style-type: none">a. Design and operation of communication systemsb. Diagnostic proceduresc. Repair and testing of communication systems
E) Accessory Circuits	<ul style="list-style-type: none">a. Comfort systemsb. Convenience systemsc. Anti-theft systemsd. Audio systemse. Driver Information and Navigation Systems
F)HYBRID VEHICLES	Design and operation Safety procedures Basic repair procedures

Performance Evaluation:

Formative Assessments	Summative Assessments
a) lab participation grade b) classroom participation c) quizzes d) midterm exam e) homework assignments	a) final exam b) lab practical exam c) completed Honda modules

Method of Instruction:

The methods of instruction that will be used in this course include but are not limited to:

- a) lecture
- b) required reading
- c) lab instruction
- d) written assignments
- e) watching assigned and in class videos
- f) Canvas usage
- g) Honda Interactive Network

Instructional Facilities:

For this course a traditional classroom with working audio/visual equipment is required as well as working lab space in the automotive lab. Access to both a lab classroom with benches and main shop space with lifts is required for this class.

Revision History:

Last recorded revision 9/10/2007 Al DeRosa
Latest Revision 3/20/2013 Al DeRosa
Latest Revision 9/25/14 Al DeRosa
Latest Revision 12-2018 Jason Felton
December 2021 Jason Felton



NASHUA COMMUNITY COLLEGE

COURSE OUTLINE FORM

Course Title: Honda Engine Performance II			
Course Prefix & No.: HATN215N	Lecture Hours: 2	Lab Hours: 4	Credit Hours: 4
Department: Industry and Transportation			
Program: Honda Automotive Technology			
Revision Date: 12/2021			

Prerequisites/ Co-requisites:

Prerequisites: , HATN205, HATN185

These prerequisite courses will introduce and reinforce topics, skills, and theory that will be required for successful completion of the subject area.

Required Accuplacer Score:

Entrance Skills:

- Basic skills in written English are required.
- Basic reading skills are required.
- Basic computer skills are required.
- Basic understanding of automotive electricity is required.
- Basic understanding of tools and procedures used to perform automotive repair is required.
- Basic understanding of physics principles is required.
- Students are expected to possess a good work ethic and a strong desire to learn.

Catalog Description:

This course is an advanced in-depth study of the engine computer management system and the various engine emission and fuel evaporation systems required to meet Federal emission and economy standards. The course will include an in-depth study and use of test equipment and scan tool operations necessary to diagnose and repair engine performance malfunctions related to the ignition, fuel and emission controls.

Course Competencies: Competency (Knowledge and Skills)	Critical Thinking Level	Linked to Program Outcome(s) #
Students will be able to:		
1. To develop a working knowledge of basic fuel and electronic fuel injection systems including related computer control systems.	The ability to recognize the operating principles of electronic fuel injection and computer systems used in Honda vehicles.	
2. To develop a working knowledge of Honda advanced emission control systems.	The ability to recognize and identify the operating principles of advanced emission control systems used in Honda vehicles.	
3. To develop the ability and self-confidence to trouble shoot and repair Honda emission control systems.	Accessing and developing a strategy to repair various Honda advanced emission control systems.	
4. To develop the knowledge required to make decisions in repairing or replacing fuel system and emission system components.	Identify and apply proper repair procedures involving Honda fuel system and emission control systems.	
5. To develop the ability to use the appropriate electronic test equipment.	Demonstrate the ability to select and properly use electronic test equipment related to the repair of Honda fuel and advanced emission control systems.	

6. To develop safe working habits and respect for the equipment and shop personnel.	The ability to recognize and apply safe work practices involved in automotive service, maintenance, and repair.	
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Course Outline:

Content Topic	Subtopics (a., b., etc.)
Introduction	
Electronic engine control modules	<ul style="list-style-type: none"> a. Types of engine control modules b. Theory of operation c. Diagnosis and repair
Electronic engine control sensors	<ul style="list-style-type: none"> a. Types of engine control sensors b. Sensor theory of operation c. Sensor diagnosis and repair procedures
Emission controls-OBD II	<ul style="list-style-type: none"> a. Exhaust gas recirculation b. Catalytic converters c. Evaporative d. Air induction reaction e. Early fuel evaporative f. Heated air intake g. Crankcase ventilation
Vehicle emissions and pollutants	<ul style="list-style-type: none"> a. Hydrocarbons b. Carbon monoxide c. Carbon dioxide d. Oxides of nitrogen e. Oxygen

Test equipment usage	<ul style="list-style-type: none"> a. Exhaust gas analyzer b. Scan tool c. Lab scope d. On-board diagnostic systems
Diagnosis and trouble shooting	<ul style="list-style-type: none"> a. Diagnosis using exhaust gas analyzer b. Diagnosis using scan tools and on board diagnostic systems

Performance Evaluation:

<p>Formative Assessments</p> <ul style="list-style-type: none"> 1. Lab participation grade 2. Classroom participation 3. Quizzes 4. Midterm exam 5. Homework assignments, reading 	<p>Summative Assessments</p> <ul style="list-style-type: none"> 1. Final exam 2. Lab practical exam
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<p>Method of Instruction:</p> <ul style="list-style-type: none"> 1. Lecture and discussion 2. Required reading 3. Demonstration 4. Laboratory work

Instructional Facilities:

Instructional facilities required for this course include:

1. A traditional classroom with working audio/visual equipment.
2. Lab space including tools and equipment commonly found in an automotive facility dealing with Honda repairs.

Revision History:

January, 2007 Roland Gies

January, 2009 Roland Gies

January, 2012 Roland Gies

April, 2013 Roland Gies

12-2018 Jason Felton

December 2021 Jason Felton

Will this course be taught online? Yes___No_X__

If yes, please complete the Online Course Outline Form.



NASHUA COMMUNITY COLLEGE

COURSE OUTLINE FORM

Course Title: Honda Heating And Air Conditioning Systems			
Course Prefix & No.: HATN221N	Lecture Hours: 2	Lab Hours: 4	Credit Hours: 4
Department: Transportation			
Program: Honda Automotive Technology			
Revision Date: 12/2021			

Prerequisites/ Co-requisites:

HATN121N, HATN113N. Co-requisite: PHYS101N.

These prerequisite courses and co-requisite course will introduce and reinforce topics, skills, and theory that will be required for successful completion of the subject area.

Required Accuplacer Score:

Entrance Skills:

- Basic skills in written English are required.
- Basic reading skills are required.
- Basic computer skills are required.
- Understanding of automotive electricity is required. Basic understanding of physics principles is required.
- Honda Modules completion of prerequisite courses as outlined by Honda IN

Catalog Description:

The theory and operations of Honda climate control systems including safety, diagnosis, service and repair will be covered. Major areas of study will include: manual and automatic controls for heating and air conditioning systems, diagnosis and repair of failed components and recovery/evacuation and charging of refrigerant systems. There will be an emphasis on safety and refrigerant recovery procedures as well as the proper use of test equipment.

Course Competencies:

Competency (Knowledge and Skills)	Critical Thinking Level	Linked to Program Outcome(s) #
Students will be able to:		
1. Perform the tasks of a service technician in a safe, clean, neat and ethical manner.	Demonstrate	
2. Understand the theory of operation of Honda automotive heating, ventilation and air conditioning systems including environmental concerns.	Describe	
3. The student will learn proper diagnosis and repair procedures for Honda automotive heating and ventilation systems.	Examine and Apply	
4. The student will learn the proper diagnosis and repair procedures for Honda automotive air conditioning systems.	Examine and Apply	
5. The student will learn to properly diagnose and repair Honda automatic climate control system controls.	Examine and Apply	
6. The student will learn the proper procedures for the safe handling of refrigerants used in automotive air conditioning systems.	Examine and Apply	

7. The student will understand and demonstrate use of refrigerant recovery, recycling, and recharging equipment.	Describe and Illustrate	
8. The student will learn the proper procedures for servicing Honda automotive air conditioner compressors.	Knowledge	
9. The student will complete the Honda training modules required for this course.	Knowledge and Application	

Course Outline:

Content Topic	Subtopics (a., b., etc.)
Introduction	
Heating and ventilation	<ul style="list-style-type: none"> a. Types of systems b. Operation c. Service d. Cases and ducts
Heating systems	<ul style="list-style-type: none"> a. Theory of operation b. Heater components c. Heater diagnosis, service and repair d. Heater controls
Refrigerants	<ul style="list-style-type: none"> a. Refrigerant safety b. Types of refrigerants c. Refrigerants and the environment d. Legislation e. Refrigerant recovery and recycling
Heat movement theory	<ul style="list-style-type: none"> a. Heat movement b. States of matter c. Latent and sensible heat d. Boiling points e. Saturated vapors and pressure temperature relationship

	f. Pressure, gauge and absolute
Air conditioning systems	<ul style="list-style-type: none"> a. Electrical switches and evaporator temperature controls b. Control head c. Automatic climate control d. Control diagnosis, service and repair
Air conditioning system inspection and diagnosis	<ul style="list-style-type: none"> a. System inspection b. Problem diagnosis c. Air conditioning pressure checks d. Air conditioning system refrigerant leak tests e. Preventive maintenance operations
Air conditioning system repair	<ul style="list-style-type: none"> a. Compressor repair b. Hose and fitting repair c. Air conditioning component replacement d. Air conditioner evacuation and recharge procedures

Performance Evaluation:

<p>Formative Assessments</p> <ul style="list-style-type: none"> 1. Lab participation grade 2. Classroom participation 3. Quizzes 4. Midterm exam 5. Homework assignments, reading 	<p>Summative Assessments</p> <ul style="list-style-type: none"> 1. Final exam 2. Lab practical exam 3. Completed Honda Modules
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Method of Instruction:

The methods of instruction that will be used in this course include but are not limited to:

- a) lecture
- b) required reading
- c) lab instruction
- d) written assignments
- e) watching assigned and in class videos
- f) Canvas usage
- g) Honda Interactive Network

Instructional Facilities:

Instructional facilities required for this course include:

1. A traditional classroom with working audio/visual equipment.
2. Lab space including tools and equipment commonly found in an automotive facility involved with automotive heating and air conditioning repairs.

Revision History:

January, 2007 Roland Gies
January, 2013 Roland Gies
April, 2013 Roland Gies
September, 2014 Al DeRosa
12-2018 Jason Felton
December 2021 Jason Felton

Will this course be taught online? Yes ___ No X ___

If yes, please complete the Online Course Outline Form.



NASHUA COMMUNITY COLLEGE
COURSE OUTLINE FORM

Course Title: Honda Transmissions and Drivelines			
Course Prefix & No.: HATN 226N	Lecture Hours: 2	Lab Hours: 6	Credit Hours: 4
Department: Industry and Transportation			
Program: Honda Automotive Technology			
Revision Date: 12/2021			

Prerequisites/ Co-requisites:

HATN 114N, HATN 121N These prerequisite courses will introduce to or reinforce topics and skills that will be required for successful completion of this course.

Required Accuplacer Score: N/A

Entrance Skills:

Without the following skills, competencies and/or knowledge, students entering this course will be highly unlikely to succeed. These skills include reading, writing, computational skills as well as computer skills. In addition to these skills the following automotive skills will be required as well; Proper lifting techniques, proper tool identification and usage, proper measuring tool usage, ability to follow repair instructions both written and verbal, ability to use supplied resources for gathering information and the proper methods for disposal of automotive fluids and components. The ability to access the Honda Interactive Network to complete required modules for Honda PACT certification.

Catalog Description:

This course is designed to introduce students to the basic principles employed in the construction, operation and diagnosis of the various components and systems involved in the transmissions (manual, automatic and CVT) of current automotive vehicles. Topics for this course include clutches, transmissions/transaxles, both front and rear wheel drive train components including drive shafts, axles and differentials. Four wheel drive and all wheel drive systems are discussed as well. This course is designed to meet the requirements of ASE Education Foundation certification in the topic of manual drive train and axles as well as automatic transmissions. All required Honda modules (both self study and skill) will be included as course work for this course. .

Course Competencies:

Competency (Knowledge and Skills)	Critical Thinking Skills
Students will be able to:	
1. Illustrate basic clutch operation, components and diagnosis	Knowledge and Analysis
2. Differentiate between basic manual and automatic transmission operation, components and diagnosis	Knowledge and Analysis
3. Outline drive line operation, components and diagnosis	Knowledge and Analysis
4. Outline differential operation, components and diagnosis	Knowledge and Analysis
5. Diagram basic four wheel and AWD operation, components and diagnosis	Knowledge and Analysis

Course Outline:

Content Topic	Subtopics (a., b., etc.)
Drive train theory	a) torque multiplication b) gear ratios c) drive train basic component identification
Clutch theory and operation	a) basic clutch design and construction b) basic clutch operation c) clutch diagnosis d) clutch repair procedures
Transmission theory and operation	a) basic transmission design and construction b) basic transmission operation and power flow c) Transmission diagnosis d) transmission disassembly, repair and reassembly
Constant velocity joints and front axles	a) cv joint design and construction b) cv joint diagnosis and repair c) front axle design and repair
Drive shafts and universal joints	a) drive shaft design and construction b) vibration and noise diagnosis and repair c) u-joint construction and repair
Rear differentials	a) basic differential theory and designs b) differential component identification c) differential diagnosis and repair

Four wheel drive systems	<ul style="list-style-type: none"> a) FWD and AWD theory and operation b) basic component identification c) system diagnosis and repair
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Performance Evaluation:

Formative Assessments	Summative Assessments
<ul style="list-style-type: none"> a) lab participation grade b) classroom participation c) quizzes d) midterm exam e) homework assignments 	<ul style="list-style-type: none"> a) final exam b) lab practical exam c) completed Honda modules

Method of Instruction:

The methods of instruction that will be used in this course include but are not limited to:

- a) lecture
- b) required reading
- c) lab instruction
- d) written assignments
- e) watching assigned and in class videos
- f) Canvas usage
- g) Honda Interactive Network

Instructional Facilities:

For this course a traditional classroom with working audio/visual equipment is required as well as working lab space in the automotive lab. Access to both a lab classroom with benches and main shop space with lifts is required for this class.

Revision History:

Last recorded revision 9/10/2007 Al DeRosa
Latest Revision 2/20/2013 Al DeRosa
Latest Revision 4/7/14 Al DeRosa
Latest Revision 12-2018 Jason Felton
December 2021 Jason Felton

Will this course be taught online? Yes ___ No X

If yes, please complete the Online Course Outline Form.



NASHUA COMMUNITY COLLEGE

COURSE OUTLINE FORM

Course Title: Honda Automotive Engine Repair			
Course Prefix & No. HATN 228N	Lecture Hours: 2	Lab Hours: 6	Credit Hours: 4
Department: Industry and Transportation			
Program: Honda Automotive Technology			
Revision Date: 12/2021			

Prerequisites/ Co-requisites:

Co requisite: PHYS 101N. Previous Honda automotive coursework contains skills that will be required and utilized in the Engine Repair class. Successful completion of all Honda Automotive coursework or program coordinator approval

Required Accuplacer Score: N/A

Entrance Skills:

Without the following skills, competencies and/or knowledge, students entering this course will be highly unlikely to succeed. These skills include reading, writing, computational skills as well as computer skills. In addition to these skills the following automotive skills will be required as well; Proper lifting techniques, proper tool identification and usage, proper measuring tool usage, ability to follow repair instructions both written and verbal, ability to use supplied resources for gathering information and the proper methods for disposal of automotive fluids and components.

Catalog Description:

This course is designed to give students a better understanding of current practices involved in the diagnosis, disassembly, cleaning, repair and reassembly of today's modern engines. Topics for this course will include engine diagnostic procedures, engine removal practices, proper teardown, cleaning and inspection processes, best practices for component repair/replacement, reassembly and engine reinstallation. There will also be discussion about engine design and some specifics regarding certain engine features that are manufacturer specific. This course is designed to meet all of the requirements for ASE Education Foundation certification and Honda modules in the Engine Repair section.

Course Competencies:

Competency (Knowledge and Skills)	Critical Thinking Skills	Linked to Program Outcome(s) #
Students will be able to:		
1. Discuss basic engine theory to properly diagnose engine mechanical failures	Knowledge and Application	
2. Demonstrate proper engine removal procedures	Duplicate	
3. Demonstrate proper teardown and cleaning procedures	Duplicate and Illustrate	
4. Discuss proper engine repair processes	Knowledge and Application	
5. Apply proper reassembly procedures for engine mechanical parts	Knowledge and Application	
6. Demonstrate how to safely and efficiently reinstall an engine	Knowledge, Application, and Utilization	

Course Outline:

Content Topic	Subtopics (a., b., etc.)
Safety and Engine Diagnosis	a) Shop safety b) Engine theory c) Engine diagnostic testing d) Diagnostic evaluation
Engine Disassembly, Cleaning, and Inspection	a) Teardown procedures b) Proper cleaning methods for different parts c) Methods of inspection d) Crack detection
Engine Block	a) Design b) Construction c) Inspection d) Repair processes
Cylinder heads	a) Cylinder head design b) Cylinder head inspection and repair c) Camshaft design and inspection d) Valve train design and inspection
Engine rotating assembly	a) Crankshaft design, inspection and repair b) Piston design, inspection and repair c) Connecting rod design, inspection and repair d) Piston ring design, inspection and repair
Engine reassembly	a) Proper engine assembly procedures b) Proper engine reinstallation procedures c) In car engine service

Performance Evaluation:

Formative Assessments	Summative Assessments
a) lab participation grade b) classroom participation c) quizzes d) midterm exam e) homework assignments	a) final exam b) lab practical exam c) completed Honda modules

Method of Instruction:

The methods of instruction that will be used in this course include but are not limited to:

- a) lecture
- b) required reading
- c) lab instruction
- d) written assignments
- e) watching assigned and in class videos
- f) Canvas usage
- g) Honda Interactive Network

Instructional Facilities:

For this course a traditional classroom with working audio/visual equipment is required as well as working lab space in the automotive lab. Access to both a lab classroom with benches and main shop space with lifts is required for this class.

Revision History:

Last recorded revision 5/2012 Al DeRosa
Latest Revision 2/25/2013 Al DeRosa
Latest Revision 10/31/2014
Latest Revision 12-2018 Jason Felton
December 2021 Jason Felton

Will this course be taught online? Yes ___ No X

If yes, please complete the Online Course Outline Form.