

NASHUA COMMUNITY COLLEGE
COURSE OUTLINE FORM

AVTN101N	Lecture Hours: 2	Lab Hours: 3	Credit Hours: 3
Department: Transportation			
Program: Aviation Technologies			
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Course Competencies:

Competency (Knowledge and Skills)	Critical Thinking Level	Linked to Program Outcome(s) #
Students will be able to: 1. Explain FAA Maintenance privileges and limitations along with the classification of Airman	Comprehension	
2. Apply proper maintenance inspections along with accurate maintenance record entries	Analysis	
3. Demonstrate the difference between a major repair and alteration with form 337	Application	
4. Describe the proper weight and balance procedures and the location of center of gravity points	Application	
5. Identify the weight and balance theory as it relates to locating the balance point or CG and performing the solution and chart formulas	Knowledge	
6. Demonstrate the differences between single engine and multi-engine aircraft weight and balance computations	Application	
7. Apply forward and aft CG checks and formulas needed to compute them	Analysis	

Course Competencies:

Competency (Knowledge and Skills)	Critical Thinking Level
Students will be able to: Explain how to fine the center of gravity after a repair or alteration	Comprehension
Describe the procedures needed to determine if you need to install a ballast	Application
Identify in finding the maximum payload and the determination for large aircraft weight and balance computations	Knowledge
Demonstrate the use of and electronic computer in the computation of weight and balance	Application

Course Outline:

Content Topic

a.) Maintenance Privileges and Limitations

Subtopics:

a.) Maintenance classifications

b.) Inspections

Course Outline:

g.) Weighing the Aircraft	a.) Equipment for weighing b.) Preparation for weighing
h.) Locating the Center of Gravity	a.) Location with respect to the datum b.) Tail wheel airplane with the datum ahead of the main wheels c.) Tail wheel airplane with the datum behind the main wheels d.) Nose wheel airplane with the datum ahead of the main wheels e.) Nose wheel airplane with the datum behind the main wheels f.) Location with respect to the mean

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

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Will this course be taught online? Yes _____ No X

If



NASHUAAVTN102

	Lecture Hours: 2	Lab Hours: 6	Credit Hours: 4
Department: Transportation			
Program: Aviation Technologies			
Revision Date: 7/2018			

Prerequisites/Co-requisites:

Student must complete and pass the College Accuplacer exam.

Required Accuplacer Score:

Entrance Skills:

- Must be able to speak, read and write in English. Must be at least 18 years of age upon the completion on this 21-month course in order to test with the FAA to obtain Airframe and Powerplant licenses
- Basic math, writing skills and some mechanical skills are preferred
- An understanding of the basic use of tools
- Knowledge and use of precision measurement equipment and related tools
- Proper use and knowledge of (PPE) Personal Protection Equipment, as related to the task
- An understanding of the safe use of equipment, along with the ability to repair using correct repair procedures, tools and

aircraft finishing
including enamel, lacquer and dope for fabric covered surfaces will also be discussed.

Course Competencies

Competency(Knowledge and Skills)

Critical Thinking
Level

Linked to Program
Outcome(s) #

Students will be able to:

Course Outline:

Content Topic

a.) Nonmetallic Aircraft Structures

Subtopics:

a.) Aircraft Wood Structures

b.) Glues and Gluing

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

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.) Watching assigned and in class videos
- e.) Canvas usage

Instructional Facilities:

For this course a traditional classroom with audio/visual equipment is required as well as working lab space in the aviation labs.

Revision History:

Last recorded revision: None

Associate Professor, Jeffrey Sullivan

Latest revision: 07/13/2018

Associate Professor, Jeffrey Sullivan

Will this course be taught online? Yes No X

If yes, please complete the Online Course Outline Form.

NASHUA COMMUNITY COLLEGE
COURSE OUTLINE FORM

CourseTitle: Airframe Structures II			
CoursePrefix & No. AVTN103N	Lecture Hours: 3	Lab Hours: 6	Credit Hours: 5
Department: Transportation			

Course Competencies

Competency(Knowledgeand Skills) Studentswill beableto:	Critical Thinking Level	Linked to Program Outcome(s) #
1. Explain the proper layout and forming of metal sheetmetal construction	Comprehension	
2. Apply proper techniques in achieving accurate radius, setback and bend allowance	Analysis	
3. Demonstrate the procedures in folding a box and forming compound curves	Application	
4. Describe the proper use of solid rivets regarding sheetmetal joints	Application	
5. Identify the formulas to use		

12. Demonstrate the NACA method of flush riveting	Application
13. Identify the safety precautions regarding welding in the person and protection equipment needed	Knowledge
14. Describe shielded metal arc welding (SMAW) and gas tungsten arc welding (GTAW)	Application
15. Demonstrate a welding bead with an oxyacetylene welder and how to inspect the weld for a cold weld	Application
16. Apply the proper technique for oxyacetylene cutting, brazing and soldering and welding aluminum	Analysis
17. Identify the steps necessary to perform a welding repair on an aircraft structure	Knowledge
18. Explain the many types of composite structure and materials	Comprehension
19. Identify the procedures needed to perform a fiberglass repair on an aircraft control surface	Knowledge
20. Demonstrate the ability to perform a repair to the fuselage of an aircraft using a Kevlar style repair	Application
21. Apply inspection and repair procedures to perform a composite structure inspection	Analysis
22. Describe procedures when working with transparent plastic materials, such as cutting, drilling and forming	Application
23. Explain the repair of transparent plastic materials that have crazing, holes or cracks on their surfaces	Comprehension

Course Outline:

Content Topic	
a.) Layout and Forming of Sheet Metal	a.) Grain of the Metal b.) Bend Radius c.) Setback d.) Bend Allowance e.) Layout of a Sheet Metal Channel f.) Folding a Box g.) Forming Compound Curves
b.) Sheet Metal Joints Using Solid Rivets	a.) Rivet

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

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.) Watching assigned and in class videos
- e.) Canvas usage

Instructional Facilities:

For this course a traditional classroom with audio/visual equipments required as well as working lab space in the aviation labs.

Revision History:

Last recorded revision 08/13/1991
Associate Professor Donald Vallerand
Latest revision 07/13/2018
Associate Professor Jeffrey Sullivan

Will this course be taught online? Yes ___ No X

If yes, please complete the Online Course Outline Form.



NASHUA COMMUNITY COLLEGE
COURSE OUTLINE FORM

No:

AVTN104	Lecture Hours: 2	Lab Hours: 3	Credit Hours: 3
Department: Transportation			
Program: Aviation Technologies			
Revision Date: 6/2018			

Prerequisites/Co-requisites:

Student must complete and pass the College Accuplacer exam.

Required Accuplacer Score:

Entrance Skills:

- Must be able to speak, read and write in English. Must be at least 18 years of age upon the completion of this 21 month course in order to test with the FAA to obtain Airframe and Powerplant licenses
- Basic math, writing skills and some mechanical skills are preferred

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Course Competencies

Competency(Knowledgeand Skills)	Critical Thinking Level	Linked to Program Outcome(s) #
Studentswill beableto: 1. Explain a working		

Course Outline:

Content Topic	Subtopics:
a.) Materials	<ul style="list-style-type: none"> a.) Metals b.) Aluminum Alloys c.) Magnesium Alloys d.) Titanium e.) Monel
b.) Nonmetal Materials	<ul style="list-style-type: none"> a.) Aircraft Wood b.) Aircraft Fabrics c.) Composite Materials d.) Plastic Resins e.) Polyester Resin and Epoxy Resin f.) Reinforcing Materials g.) Glass Fibers, Kevlar, Graphite
c.) Metal Heat Treatment	<ul style="list-style-type: none"> a.) Ferrous Metal Heat Treatment b.) Nonferrous Metal Heat Treatment c.) Aluminum and Magnesium Alloys d.) Titanium Alloys e.) Stress Relieving, Annealing, Thermal and Case Hardening f.) Hardness Testing g.) Rockwell and Brinell Hardness Testing
d.) Nondestructive Inspection	<ul style="list-style-type: none"> a.) Radiographic Inspection b.) Magnetic Particle Inspection c.) Eddy Current Inspection d.) Ultrasonic Inspection e.) Penetrant Inspection f.) Welding Inspection g.) Bonded Structure Inspection
e.) Aircraft Hardware	<ul style="list-style-type: none"> a.) Threaded Fasteners b.) Cowling Fasteners c.) Aircraft Control Cable d.) Aircraft Rivets
f.) Measuring Devices	<ul style="list-style-type: none"> a.) Dial Indicators b.) Micrometer and Vernier Calipers d.) Small Hole Gages and Telescoping Gages e.) Dividers and Calipers f.) Thickness and Valve Stretch Gage g.) Connecting Rod Twist Fixture

Performance Evaluation:

Formative Assessments	Summative Assessments
<ul style="list-style-type: none">a.) Lab participation gradeb.) Classroom participationc.) Quizzesd.) Midterm exame.) Homework assignments	<ul style="list-style-type: none">a.) Final examb.) Lab practical exam

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.) Watching assigned and in class videos
- e.) Canvas usage

Instructional Facilities:

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For this course at 1.7 (Se) TJ re W n 478.5 -1.4 To s

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: Aircraft Systems

Course Prefix &
No. AVTN105N

Lecture Hours: 3

Lab Hours: 3

Credit Hours: 4

Department: Transportation

Program: Aviation Technologies

Revision Date: 7/2018

Prerequisites/Co-requisites:

Student must complete and pass the College Accuplacer exam.

Required Accuplacer Score:

Entrance Skills:

- Must be able to speak, read and write in English. Must be at least 18 years of age upon the completion of this 21 month course in order to test with the FAA to obtain Airframe and Powerplant licenses
- Basic math, writing skills and some mechanical skills are preferred
- An understanding of the basic use of tools
- Knowledge and use of precision measurement equipment and related tools
- Proper use and knowledge of (PPE) Personal Protection Equipment as related to the task
- An understanding of the safe use of equipment along with the ability to follow safety instructions

Catalog Description:

This course incorporates aircraft instruments and aircraft systems. Topics include basic airframe instruments, correct handling and installation procedures for instruments, ice and drain control systems, fire protection systems, position and warning systems, cabin atmosphere and oxygen systems, fuel systems, inspection, checks, servicing and repair of the various systems and their components

Course Competencies

Competency(Knowledge and Skills)

Students will be able

17. Identify components in the fuel quantity measuring system and how each of them are vital for accurate and temperature compensated measurements	Knowledge	
18. Demonstrate the proper way to run a fuel line, it's alignment and bonding	Application	
19. Apply techniques necessary for fuel system troubleshooting using aircraft manufacturer schematic diagrams and logic charts	Analysis	
20. Identify the effects on the human body regarding altitude pressure and temperatures	Knowledge	

21. Describe four types of

Course Outline:

Content Topic	Subtopics:
a.) Overview of Aircraft Instruments	a.) Classification of Aircraft Instruments b.) Pressure Measuring Instruments c.) Temperature Measuring Instruments d.) Mechanical Movement Measuring Instruments e.) Direction Indicating Instruments f.) Gyroscopic Instruments
b.) Aircraft Instrument Systems	a.) Pitot-Static Systems b.) Gyro instrument Power Systems c.) Automatic Flight Control Systems
c.) Aural Warning Systems	a.) No Subtopics

d.) Instrument Installation and

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g.) Fuel Heaters

a.) NoSubtopics

a.) FuelQuantityMeasuringSystems

b.) Fuel Flowmeters

h.) Fuel SystemInstruments

a.) Ice Control Systems	<ul style="list-style-type: none"> a.) Dangers of In-Flight Icing b.) Types of Ice Control Systems c.) Pitot Static System Ice Protection d.) Windshield Ice Protection e.) Airfoil Ice Protection f.) Brake Deice System g.) Powerplant Ice Protection h.) Water Drain System Ice Protection i.) Ground Deicing and Anti-Icing
b.) Rain Removal Systems	a.) No Subtopics
Fire Protection Systems	Fire Protection Systems
a.) Fire Protection Systems	<ul style="list-style-type: none"> a.) Fire Detectors and Overhead Detection Systems b.) Thermostatic Type Fire Detection System c.) Rate of temperature rise Detection System d.) Continuous Loop Detector System e.) Smoke and Flame Detectors
b.) Fire Extinguishing Systems	<ul style="list-style-type: none"> a.) Hand Held Fire Extinguishers b.) Fire Extinguishing Agents c.) Installed Fire Extinguishing Systems
c.) Complete Fire Protection System	<ul style="list-style-type: none"> a.) Engine Fire Detection and Extinguishing b.) APU Fire Detection and Extinguishing c.) Lower Cargo Compartment Smoke Detectors and Fire Suppression d.) Wheel Well Overhead Monitoring e.) Wing and Body Overhead Monitoring f.) Lavatory Smoke Detection and Fire Extinguisher

Performance Evaluation:

<p>Summative Assessments</p> <ul style="list-style-type: none"> a.) Final ex(e)-1.4 (.)-13.1m rd.)
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Instructional Facilities:

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: Aviation Electronics			
Course Prefix & No. AVTN106N	Lecture Hours: 2	Lab Hours: 2	Credit Hours: 3
Department: Transportation			
Program: Aviation Technologies			
Revision Date: 7/2018			

Prerequisites/Co-requisites:

Student must complete and pass the College Accuplacer exam.

Required Accuplacer Score:

Entrance Skills:

- Must be able to speak, read and write in English. Must be at least 18 years of age upon the completion on this 21 month course in order to test with the FAA to obtain Airframe and Powerplant licenses
- Basic math, writing skills and some mechanical skills are preferred. If knowledge of precision measurement equipment is required, the following are also required:
 - Proper use and knowledge of (PPE) Personal Protection Equipment
 - An understanding of the safe use of

Course Competencies

Competency(Knowledgeand Skills) Studentswill beableto:	Critical Thinking Level	Linked to Program Outcome(s) #
1. Explain how electrons and valance electro flow inanelectricalcircuit	Comprehension	
2. Apply techniques used to find the direction the flowof electricity	Analysis	
3. Demonstrate the difference between static electricityandcurrentelectricity	Application	
4. Describe the production of electricity andw how it relates to heat, chemical action, pressure, light andmagnetism	Application	
5. Identify the formula for Ohm's law and providexamples	Knowledge	
6. Demonstrate the differences between dire currentanalternatingcurrentelectricity	Application	
7. Apply techniques used to troubleshoot seri andparallelcircuits	Analysis	

8. Identify the formulas used for computation:

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17. Explain the difference between a Zener diode and a conventional diode and how they work in an electrical circuit	Comprehension	
18. Describe the difference between a transformer and a rectifier	Knowledge	
19. Apply knowledge on how and why direct current motors are more widely used on light aircraft and alternating current motors are more widely used on larger aircraft	Analysis	
20. Explain what an integrated digital circuit is in the proper troubleshooting procedures using electrical meters	Comprehension	
21. Demonstrate the difference between a simple chemical cell, primary and secondary cells. Explain how these are used in the aircraft	Application	
22. Apply knowledge on the effects of magnetism in an electrical motor or generator. Explain how these magnets, when oriented in the proper North and South poles, can produce magnetic flux lines, which can produce electricity	Analysis	

Course Outline:

Content Topic

h.) Solid-State Devices	<ul style="list-style-type: none"> a.) Semiconductor Theory b.) Semiconductor Diodes c.) Zener Diodes d.) Silicon Controlled Rectifiers e.) Triacs f.) Transistors g.) Optoelectronic Devices
i.) Integrated Circuits	<ul style="list-style-type: none"> a.) Digital Integrated Circuits b.) Linear Integrated Circuits
j.) Chemical Energy into Electricity	<ul style="list-style-type: none"> a.) Simple Chemical Cell b.) Primary Cells c.) Secondary Cells
k.) Aircraft Batteries	<ul style="list-style-type: none"> a.) Lead Acid Batteries b.) Nickel Cadmium Batteries
l.) Magnetism	<ul style="list-style-type: none"> a.) Permanent Magnets b.) Electromagnets
m.) Electrical Motors	<ul style="list-style-type: none"> a.) Direct Current Motors b.) Alternating Current Motors
n.) Electrical Generators	<ul style="list-style-type: none"> a.) Direct Current Generators
o.) Aircraft Electrical Circuits	<ul style="list-style-type: none"> a.) Electrically Retractable Landing Gear b.) Electrically Operated Fuel Valves

Performance Evaluation:

FbFo

Method

Will this course be taught online? Yes No

If yes, please complete the Online Course Outline Form.



NASHUA COMMUNITY COLLEGE

COURSE OUTLINE FORM

Course Title: Digital Logic / Communication and Navigation Systems			
Course Prefix & No. AVTN107N	Lecture Hours: 2	Lab Hours: 2	Credit Hours: 3
Department: Transportation			
Program: Aviation Technologies			
Revision Date: 7/2018			

Prerequisites/Co-requisites:

AVTN106N

Student must also complete and pass the College Accuplacer exam.

Required Accuplacer Score:

Entrance Skills:

- Must be able to speak, read and write in English. Must be at least 18 years of age upon the completion on this 2-month course in order to test with the FAA to obtain Airframe and Powerplant licenses
- Basic math, writing skills and some mechanical skills are preferred
- An understanding of the basic use of tools
- Knowledge and use of precision measurement equipment and related tools
- Proper use and knowledge of (PPE) Personal Protection Equipment, as related to the task
- An understanding of the safe use of

Course Competencies

Competency(Knowledge and Skills) Students will be able to:	Critical Thinking Level	
1. Explain the various Logic Symbols and elements	Comprehension	
2. Apply use of system drawings and control diagrams	Analysis	
3. Demonstrate Basic Radio Theory, to include modulation, radio waves and antennas	Application	
4. Describe Aircraft Communication Addressing and Reporting System (ACARS)	Application	
5. Identify the operation and location of an Emergency Locator Transmitter (ELT)	Knowledge	
6. Demonstrate the difference between Very High Frequency Omnidirectional Range Navigation Systems (VOR) and Instrument Landing System (ILS)	Application	
7. Apply proper troubleshooting technique the Traffic Alert / Collision Avoidance System (TCAS)	Analysis	
8. Explain how Distance Measuring Equipment allows pilot information as to how far away he / she is from airport or NAV or VOR stations	Comprehension	
9. Describe the operation of the Global Positioning System and Inertial Navigation System	Application	
10. Identify the relationship between Weather Radar System and Radar Altimeters	Knowledge	
11. Demonstrate meaning of the term, Terrain Awareness Warning System (TAWS)	Application	
12. Explain how the Electronic Flight Instrument System Works	Comprehension	
13. Identify components of the Air Data Computer System	Knowledge	
14. Apply proper Electronic Systems Installation and Maintenance	Analysis	

<p>b.) Electronic Navigation Systems</p>	<p>a.) Automatic Direction of Finder (ADF) b.) Very High Frequency Omnidirectional Range Navigation System (VOR) c.) Instrument Landing System (ILS) d.) Radar Beacon Transponder e.) Traffic Alert / Collision avoidance system (TCAS) f.) Distance Measuring Equipment (DME) g.) Area Navigation (RNAV) h.) LORAN i.) Global Positioning System (GPS) j.) Wide Area Augmentation System (WAAS) k.) Inertial Navigation System (INS) l.) Microwave Landing System (MLS) m.) Radar and Radial Altimeters o.) Terrain Awareness Warning System (TAWS) p.) Radar q.) Lightning Detector System</p>
<p>c.) Electronic Instrument Systems</p>	<p>a.) Microcomputers b.) Digital Indicating and Control Systems c.) Air Data Computer (ADC) d.) Flight Management Computer System (FMCS)</p>
<p>d.) Electronic Systems Installation and Maintenance</p>	<p>a.) Approval for Installation of Electronic Equipment b.) Electrical Considerations c.) Protection from Electrostatic Discharge Damage d.) Weight and Balance e.) Cooling f.) Shock Mounting g.) Static Protection h.) Antenna Installation</p>

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

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.) Watching assigned and in class videos
- e.) Canvas usage

Instructional Facilities:

For this course a traditional classroom with audio/visual equipments required as well as working lab space in the aviation labs.

Revision History:

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: Aviation Drafting and Blueprint Reading

Course Prefix &
No. AVTN108N

Lecture Hours: 3 Lab Hours: 0

Credit Hours: 3

Prerequisites/Co-requisites:

Student must complete and pass the College Accuplacer exam.

Required Accuplacer Score:

Entrance Skills:

- Must be able to speak, read and write in English. Must be at least 18 years of age upon the

This course is the study of the fundamentals of drafting and blueprint reading. This course will enable students enrolled in the Aircraft Maintenance Training program to develop the required skills to meet the FAA basic drafting and blueprint reading standards.

Course Competencies

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Competency(Knowledge

Course Outline:

Content Topic	Subtopics:
a.) Types of Aircraft Drawings	a.) Detail, Assembly and Installation Drawings b.) Sectional, Half Sectional and Cutaway Drawings c.) Exploded View, Schematic and Block Drawings d.) Repair Drawing, Wiring and Pictorial Diagrams e.) Sketches
b.) Drawing Views	a.) Perspective Views b.) Isometric Views c.) Orthographic Views d.) Auxiliary Views
c.) Drawing Practices	a.) Line Types and Weights

Will this course be taught online? Yes No X

NASHUA COMMUNITY COLLEGE
COURSE OUTLINE FORM

Course Title: Airframe Electrical Systems Course Prefix & No.

Competency(Knowledgeand Skills) Studentswill beableto:	Critical Thinking Level	Linked to Program Outcome(s) #
1. Explain various circuit control and protection devices Name the different types of switches used in aircraft electrical circuits	Comprehension	
2. Apply proper circuit arrangement with series and parallel electrical circuit	Analysis	
3. Demonstrate the difference between Semiconductor diodes and the Zener diodes	Application	
4.		

Course Outline:

Content Topic	Subtopics:
a.) An Introduction to Aircraft Electrical Systems	a.) Electrical System Requirements b.) Review of Terms c.) Direction of Current Flow d.) Electrical System Components e.) Circuit Arrangement
b.) Aircraft Electrical Power Circuits	a.) Battery Circuits b.) Ground Power Circuit c.) Power Generating Systems d.) Voltage and current Indicating Circuits
c.) Aircraft Electrical Load Circuits	a.) The Starter and Navigation Light Circuit b.) Landing and Taxi Light Circuit c.) Landing Gear Actuation and Indicating Circuit d.) Anti-skid Brake System e.) Electrical Propeller

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Performance Evaluation:

Formative Assessments

- a.) Lab participation grade
- b.) Classroom participation
- c.) Quizzes
- d.) Midterm exam

NASHUA COMMUNITY COLLEGE
COURSE OUTLINE FORM

Course

Competency(Knowledgeand Skills) Studentswill beableto:	Critical Thinking Level	Linked to Program Outcome(s) #
1. Explain the basic laws of physics as they apply to fluid power systems.	Comprehension	
2. Apply Bernoulli's principle and its relationship to the pressure drop in a moving fluid	Analysis	
3. Demonstrate advantages and disadvantages of fluid power systems	Application	
4. Describe the proper procedures to repair a sealed brake system	Application	
5. Identify the difference between a single acting actuator system and a double acting actuator system	Knowledge	
6. Demonstrate how the aircraft power pack system		

<p>16. Describe low pressure pneumatic systems and how they work to provide power to several aircraft systems</p>	<p>Application</p>	
<p>17. Apply knowledge of the jet transport aircraft hydraulic system's installation, indications and automatic control of the hydraulic fluid for many aircraft systems</p>	<p>Analysis</p>	
<p>18. Explain the procedures needed to effectively perform system maintenance and troubleshooting, on the aircraft hydraulic system</p>	<p>Comprehension</p>	

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

Will this course be taught online? Yes ___ No X

If yes, please



NASHUA COMMUNITY COLLEGE
COURSE OUTLINE FORM

Course Title: Assembly and Rigging			
Course Prefix & No. AVTN204N	Lecture Hours: 2	Lab Hours: 6	Credit Hours: 4
Department: Transportation			
Program: Aviation Technologies			
Revision Date: 7/2018			

Prerequisites/Co-requisites:

AVTN101N, AVTN203N
Student must complete and pass the College Accuplacer exam.

Required Accuplacer Score:

Entrance Skills:

- Must be able to speak, read and write in English. Must be at least 18 years of age upon the completion on this 21

16. Demonstrate the procedures on how to lo
up records

Course Competencies

Competency(Knowledgeand Skills)	Critical Thinking Skills	Linked to Program Outcome(s) #
Studentswill beableto: 1. Describe components and operation of a reciprocating engine and discuss the revolutionary changes of the		

Course Outline:

Content Topic

a.)

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

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.) Watching assigned and in class videos
- e.) Canvas usage

Instructional Facilities:

For this course a traditional classroom with audio/visual equipments required as well as working lab space in the aviation labs.

Revision History:

Last recorded revision 09/27/2017

Associate Professor, Jeffrey Sullivan

Latest revision 06/27/2018

Associate Professor, Jeffrey Sullivan

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: Reciprocating Engines II			
Course Prefix & No. AVTN207N	Lecture Hours: 3	Lab Hours: 6	Credit Hours: 5
Department: Transportation			
Program: Aviation Technologies			
Revision Date: 7/2018			

Prerequisites/Co-requisites:

A student must have successfully completed AVTN207N and have also successfully completed the required accuplacer exam.

Required Accuplacer Score:

Entrance Skills:

- Must be able to speak, read and write in English. Must be at least 18 years of age upon the completion of this 2-month course in order to test with the FAA to obtain Airframe and Powerplant licenses
- Basic math, writing skills and some mechanical skills are preferred
- An understanding of the basic use of tools, as related to engine disassembly and reassembly
- Knowledge and use of precision measurement equipment and related tools
- Proper use and knowledge

Course Competencies

Competency(Knowledgeand Skills)	Critical Thinking Level	Linked to Program Outcome(s) #
Studentswill beableto: 1. Demonstrate an aircraft's reciprocating engine		

Performance Evaluation:

Formative Assessments	Summative Assessments
<ul style="list-style-type: none">a.) Lab participation gradeb.) Classroom participationc.) Quizzesd.) Midterm exame.) Homework assignments	<ul style="list-style-type: none">a.) Final examb.) Lab practical exam

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.) Watching assigned and in class videos
- e.) Canvas usage

Instructional Facilities:

For this course a traditional classroom with audio/visual equipments required as well as working lab space in the aviation labs.

Revision History:

Last recorded revision 07/28/2017

Associate Professor, Jeffrey Sullivan

Latest revision 07/01/2018

Associate Professor, Jeffrey Sullivan

Will this course be taught online? Yes ___ No X

If yes, please complete the Online Course Outline Form.

NASHUA COMMUNITY COLLEGE
COURSEOUTLINE FORM

Course Title: Engine Systems

Course Prefix & No. AVTN208N Lecture Hours: 2 Lab Hours: 3 Credit Hours: 3

Program: Aviation Technologies

Revision Date 12/2017

Prerequisites/ Co-requisites

A student must have completed all FAA General Section courses or possess an FAA Airframe Certificate to be eligible to take this course. Student must have also successfully completed course AVTN206N Reciprocating Engines I

Required Accuplacer Score:

Entrance Skills:

- Basic math, reading and writing skills in English
- An understanding of basic tool usage as related to component disassembly and reassembly
- Knowledge and use of precision measurement equipment and related tools
- Proper use and knowledge of (PPE) Personal Protection Equipment, as related to the task
- An understanding of the safe use of tools and equipment

Course Competencies

Course Outline:

Content Topic	Subtopics
a.) Functions of lubrication systems	a.) Reduces friction, seals and cushions b.) Cleans inside of engine c.) Performs hydraulic action d.) Protects against corrosion e.) Removes heat
b.) Reciprocating engine lubricating oils	a.) Characteristics of lubricating oil b.) Types of lubricating oils c.) Compatibility of lubricating oils
c.) Reciprocating engine lubrication systems	a.) Types of lubrication systems b.) Oil supply storage c.) Internal lubrication
d.) Evolution of reciprocating engine exhaust systems	a.) Cabin and carburetor heat provisions b.) Mufflers c.) Augmentor tubes d.) Power recovery devices e.) Exhaust system inspection and repair
e.) Evolution of reciprocating engine cooling systems	a.) Air cooled engines b.) Liquid cooled engines c.) Cooling system inspection and maintenance
f.) Fire protection systems	a.) Types of fires b.) Fire zones

Content Topic	Subtopics
g.) Fire Detection and Warning Systems	a.) Thermoswitch type fire detection system b.) Rate of temperature rise detection system c.) Continuous loop fire and overheat detection system
h.) Fire Extinguishing Systems	a.) Fire extinguishing agents b.) Powerplant fire extinguishing systems
i.) Complete Fire Protection System	a.) Maintenance and servicing of fire detection systems b.) Maintenance and service of fire extinguishing systems
j.) Types of Powerplant Instruments	a.) Pressure measurement b.) Types of pressures c.) Pressure measuring instruments d.) Temperature measurement

Method of Instruction :

Will this course be taught online? Yes No X



NASHUA COMMUNITY COLLEGE

COURSE OUTLINE FORM

Course Title: Aircraft Propellers			
Course Prefix & No. AVTN209N	Lecture Hours: 2	Lab Hours: 3	Credit Hours: 3
Department: Transportation			
Program: Aviation Technologies			
Revision Date: 5/2018			

Prerequisites/Co-requisites:

A student must have completed all FAA General Section courses or possess an FAA Airframe Certificate to be eligible to take this course. Student must also complete and pass the College Acc completion on this month course in

- Powerplant licenses
- Basic math, writing skills and some mechanical
- An understanding of the basic use of tools
- Knowledge and use of precision measurement
- Proper use and knowledge of (PPE) Personal
- An understanding of the safe use of equipment

Catalog Description:

This course is a study of the physical laws and design characteristics governing propeller operation. Students receive instruction on propeller theory and maintenance, propeller control system components, types of propeller and propeller installations, identification and selection of propeller lubricants, inspecting, servicing and repairing of a fixed pitch, constant speed and feathering propellers, propeller governing systems, propeller synchronizing and ice control

CourseCompetencies

Competency(Knowledgeand Skills)

Course Outline:

Content Topic	Subtopics
a.) Introduction to Aircraft propellers	a.) Propeller theory b.) Propeller pitch and angle of attack c.) Propeller tip Speed and efficiency d.) Forces acting on a propeller e.) Classifications of propellers
b.) Propellers for Reciprocating Engines	a.) Fixed pitch propellers including wood and metal b.) Ground adjustable propellers c.) Control pitch propellers d.) Two position propellers e.) Automatic propellers f.) Constant speed and counterweight propellers g.) Feathering Constant Speed propellers h.) Reversible Constant Speed propellers

c.) Propellers for Turbine Engines

- a.) Turbo-prop Engines
- b.) Garrett and Pratt & Whitney 115156 Tm () Tj ET Q q 69.8 4044.273 0

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

Will this course be taught online? Yes _____ No X

If yes,



NASHUA COMMUNITY COLLEGE

COURSE OUTLINE FORM

Course Title: Turbine Engine and Systems			
Course Prefix & No. AVTN210N	Lecture Hours: 3	Lab Hours: 3	Credit Hours: 4
Department: Transportation			
Program: Aviation Technologies			
Revision Date: 7/2018			

Prerequisites/Co-requisites:

AVTN208N
 A student must have completed all FAA General Section courses or possess an FAA Airframe Certificate to be eligible to take this course. Student must complete and pass the College Accuplacer exam.

Required Accuplacer Score:

- Entrance Skills:**
- Must be able to speak, read and write in English. Must be at least 18 years of age upon the completion on this 2 month course in order to test with the FAA to obtain Airframe and Powerplant licenses
 - Basic math, writing skills and some mechanical skills are preferred
 - An understanding of the basic use of tools
 - Knowledge and use of precision measurement equipment and related tools
 - Proper use and knowledge of (PPE) Personal Protection Equipment related to the task
 - An understanding of the safe use of equipment along with the ability to follow safety instructions

Catalog Description:

The theory and maintenance of gas turbine engine systems and installation are covered in this course. Topics include theory of operation, operating characteristics, axial and centrifugal flow compressors, combustion chambers, exhaust sections, fan and bypass turbine engines, thrust reversing systems, turbine section and turbine blade design. Inspection and adjustment of gas turbine engines are included. Exhaust systems, fuel metering systems, lubrication systems and cooling systems will be covered along with operation and maintenance procedures, for turbine engines.

Course Competencies

Competency(Knowledge and Skills) Students will be able to:	Critical Thinking Level	Linked to Program Outcome(s) #
1. Explain the practical review of physics, as related to propulsion principles	Comprehension	
2. Apply formulas needed to calculate the many physics related definitions	Analysis	
3. Demonstrate the difference between jet breathing engines and air breathing reaction engines	Application	
4. Describe what a turbojet, turboprop, turbofan shaft, turbofan all have in common to produce the necessary thrust for the aircraft	Application	
5. Identify how thrust is produced in the aircraft gas turbine engine	Knowledge	
6. Demonstrate engine station designations and what they mean	Application	
7. Apply design features of air inlet ducts and compressors	Analysis	
8. Describe how the air flows through the gas turbine engine compressors and what happens at each stage of compression	Application E05 7-10.1.82102.a	

16.

33. Explain the many procedures necessary to perform the starting of a gas turbine engine	Comprehension	
34. Apply the procedure for engine trimming	Analysis	
35. Demonstrate the differences between a hot start and a hung start	Application	
36. Describe the procedures for inspection using borescope's, fiberscope's and electronic imaging equipment	Application	
37. Identify the proper use of torque wrenches and other precision tooling needed for repair	Knowledge	
38. Demonstrate the proper and safe procedures to perform turbine engine troubleshooting and repairs	Application	
39. Describe the many components and operation of turbine engine exhaust systems, including noise suppressors, thrust reversers, afterburners and vectored thrust engines	Application	

Course Outline:

Content Topic	Subtopics:
a.) Propulsion Principles	a.) Theory and Construction b.) A Practical Review of Physics
b.) Aircraft Turbine Engines	a.) Non-Air Breathing (Rocket) Engines b.) Air Breathing Reaction Engines c.) Gas Turbine Engines

c.) Thrust Atr20 Td [u(20 Tdhr)-83 (u)-185 (No2

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h.) Requirements for Turbine Engines Lubricants	a.) Synthetic lubricating oil
i.) Turbine Engine Lubrication Systems	a.) Wet Sump Lubrication System b.) Dry sump Lubrication System c.) Lubrication System Subsystems d.) Bearings and Seals e.) Lubrication System Components f.) Lubrication System Instrumentation g.) Lubrication System Servicing h.) Oil analysis
j.) Turbine Engine Cooling Systems	a.) No Subtopics
k.) Turbine Engine Fuels	a.) Jet Fuel Volatility b.) Jet Fuel Viscosity c.) Microbial Growth in Jet Fuel Tanks d.) Fuel Anti-Icing e.) Fuel Handling
l.) Turbine Engine Fuel Systems	a.) Fuel System Components b.) Turbine engine fuel control
m.) Turbine Engine Exhaust	a.) Noise Suppressors b.) Thrust Reversers c.) Afterburners d.) Vectored Thrust Engines
n.) Turbine Engine Operation	a.) Starting Gas Turbine Engines b.) No Oil Pressure c.) Hot Start d.) Hung Start
o.) Turbine Engine Maintenance	a.) On-Condition Maintenance b.) Trend Monitoring c.) Types of Maintenance
p.) Turbine Engine Inspections and Repair	a.) Borescope, Fiberscope, Electronic Imaging b.) Routine Inspections c.) Non-Routine Inspections d.) Repair Considerations
q.) Turbine Engine Testing	a.) Engine Trimming
r.) Turbine Engine Troubleshooting	a.) No Subtopics

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

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.) Watching assigned and in class videos
- e.) Canvas usage

Instructional Facilities:

For this course a traditional classroom with audio/visual equipments required as well as ~~an Online Course Outline Form~~

Will this course be taught online? Yes ___ No X

If yes, please complete the Online Course Outline Form.

NASHUA COMMUNITY COLLEGE
COURSE OUTLINE FORM

complete and pass the College

Course Title: Carburetion and Fuel Systems

Course Prefix &
No. AVTN211N

Technologies

Required Accuplacer Score:

Entrance Skills:

- Must be able to speak, read and write in English. Must be at least 18 years of age upon the completion of this 21 month course in order to test with the FAA to obtain Airframe and Powerplant licenses
- Basic math, writing skills and some mechanical skills are preferred
- An understanding of the basic use of tools
- Knowledge and use of precision measurement equipment and related tools
- Proper use and knowledge of (PPE) Personal Protective Equipment, as related to the task
- An understanding of the safe use of

Competency(Knowledgeand Skills) Studentswill beableto:	Critical Thinking Level	Linked to Program Outcome(s) #
1. Describe the theory of energy transformation and its relationship to power the aircraft engine with the heat energy it produces. Thermal efficiency, specific fuel consumption and mixture ratios will also be discussed.	Knowledge	
2. Identify the various grades of engine fuel used along with their respective heat energy content, vapor ratio, critical pressures and temperatures. The use of proper fuel grades and additives will also be discussed.	Analysis	
3. Describe the several configurations of engine fuel metering devices. These include float carburetors, pressure carburetors and fuel injection systems. 4. Explain the many different fuel delivery systems. These include main and idling jet metering systems, power enrichment systems, acceleration and mixture control systems.	Comprehension	

11. Identify early vintage reciprocating and radial engines equipped with anti-detonation systems, the theory behind them and the application on the various engines.	Knowledge	
12. Describe procedures for maintenance record entries pertaining to fuel delivery systems.	Comprehension	
13. Demonstrate proper log book procedures with strict adherence to Airworthiness Directives and Service Bulletins.	Application	

Course Outline:

Content Topic	Subtopics
a.) Transformation of Energy	<ul style="list-style-type: none"> a.) Thermal efficiency b.) Specific fuel consumption c.) Mixture ratio and engine power d.) Detonation and preignition
b.) Reciprocating Engine Fuels	<ul style="list-style-type: none"> a.) Aviation gasoline and specifications b.) Heat energy content c.) Vapor pressure, critical pressure and temperatures d.) Gasoline additives and ratings, automobile grades e.) Importance of proper fuel grades
c.) Reciprocating Engine Fuel Metering Systems	<ul style="list-style-type: none"> a.) Float carburetors Pressure carburetors b.) Fuel Injection systems both RSA and TCM c.) Main and

h.) Recordkeeping	a.) Maintenance record entry and compliance b.) Proper engine log book entries and procedures c.) Service Bulletins and Airworthiness Directives d.) Maintenance airworthiness release
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Performance Evaluation:

Formative Assessments a.) Lab participation grade b.) Classroom participation c.) Quizzes d.) Midterm exam e.) Homework assignments	Summative Assessments a.) Final exam b.) Lab practical exam
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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.) Watching assigned and in class videos
- e.) Canvas usage

Instructional Facilities:

For this course a traditional classroom with audio/visual equipments required as well as working lab space in the

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: Engine Electrical Systems			
Course Prefix & No. AVTN212N	Lecture Hours: 2	Lab Hours: 6	Credit Hours: 4
Department: Transportation			
Program: Aviation Technologies			
Revision Date: 7/2018			

Prerequisites/Co-requisites:

AVTN202N, AVTN206N

A student must have completed all FAA General Section courses or possess an FAA Airframe Certificate to be eligible to take this course. Student must complete and pass the College Accuplacer exam.

Required Accuplacer Score:

Entrance Skills:

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This course covers additional powerplant accessory systems including magnetos, high and low tension systems, reciprocating and turbine engine ignition systems. Included will be the turbine engine starting system, all its components, troubleshooting and servicing.

Course Competencies

Competency(Knowledgeand Skills)	Critical Thinking Level	Linked to Program Outcome(s) #
Studentswill beableto: 1. Explain the difference between a battery e		

Course Outline:

Content Topic

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

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

Will this course be taught online? Yes ___ No X

If yes, please complete the Online Course Outline Form.