

**NEOSHO COUNTY COMMUNITY COLLEGE
MASTER COURSE SYLLABUS**

COURSE IDENTIFICATION

Course Code/Number: AERO 115

Course Title: Aerospace Blueprint Reading

Division: Applied Science (AS) Liberal Arts (LA) Workforce Development (WD)
 Health Care (HC) Lifetime Learning (LL) Nursing Developmental

Credit Hour(s): Two (2)

Effective Date: Fall 2013

Assessment Goal Per Outcome: 80%

COURSE DESCRIPTION

This course is worth 2 hours of college credit. It teaches basic concepts associated with blueprints including using a production line, understanding terminology, comparing blueprint elements, interpreting lines, identify dimension and tolerance, interpret common GD&T symbols, interpret fastener symbols and common aircraft symbols.

MINIMUM REQUIREMENTS/PREREQUISITES AND/OR COREQUISITES

High school diploma or GED or ability to benefit

TEXTS

* The official list of textbooks and materials for this course is found on *myNeosho*.

<http://www.neosho.edu/ProspectiveStudents/Registration/CourseSyllabi.aspx>

GENERAL EDUCATION OUTCOMES

1. Practice Responsible Citizenship through:
 - identifying rights and responsibilities of citizenship,

- identifying how human values and perceptions affect and are affected by social diversity,
 - identifying and interpreting artistic expression.
2. Live a healthy lifestyle (physical, intellectual, social) through:
 - listing factors associated with a healthy lifestyle and lifetime fitness,
 - identifying the importance of lifetime learning,
 - demonstrating self-discipline, respect for others, and the ability to work collaboratively as a team.
 3. Communicate effectively through:
 - developing effective written communication skills,
 - developing effective oral communication and listening skills.
 4. Think analytically through:
 - utilizing quantitative information in problem solving,
 - utilizing the principles of systematic inquiry,
 - utilizing various information resources including technology for research and data collection.

COURSE OUTCOMES/COMPETENCIES (as Required)

- 1) The student will understand the basics concepts associated with blueprints.
 - a. Define, blueprint, engineering drawing, blueprint line, blueprint symbol.
 - b. Describe the blueprint cycle.
 - c. Describe the history of blueprints
 - d. Describe the language of blueprints.
 - e. Identify the variety of symbols used on blueprints including aircraft, welding, architecture, machining, fasteners, electrical, hydraulic and geometric locations.
 - f. Explain why blueprints are standardized.
 - g. Identify the common standardization organizations: ISO and ASME.
 - h. Identify the common sizes of blueprints.
- 2) The student will be able to effectively utilize a production drawing in the shop.
 - a. Describe the types of production drawings; detail, installation and assembly.
 - b. Describe the elements of detail, assembly and installation drawing.
 - c. Identify what is and is not an assembly.
 - d. Discuss the common elements of production drawing; boarder, title block, revision block, picture area, parts list.
- 3) The student will identify terminology common to blueprints and explain their relationships.
 - a. List the basic shapes used on blueprints; point and lines, surfaces, planes, angles.
 - b. Identify line types used on blueprints.
 - c. Identify the angle types used on blueprints.
 - d. Explain the relationships that exist between two or more lines: surfaces, planes, angles, perpendicular lines, right angles, parallel lines, acute angle, obtuse angle, complimentary angle, supplementary angle.
 - e. Measure an angle.

- f. Identify types of circles and terminology associated with them including concentric, eccentric, circumference, diameter and radius.
- g. Explain the relationships that exist between two or more circles; concentric circles, eccentric circles, arc, tangent, chord, straight arc, arch between radii
- h. Identify common angles and arcs including; straight angle, right angle, acute angle, obtuse angle, complimentary angle. Supplementary angle, arc between two radii
- i. Measure a circle.

4) The student will be able to compare and contrast the elements of blueprint views.

- a. Explain how blueprints are drawn.
- b. Describe pictorial drawings, perspective view isometric view, oblique view, and orthographic drawings.
- c. Compare and contrast the differences between perspective, isometric and orthographic drawings.
- d. Describe orthographic projection including its principles and views.
- e. Identify the most common orthographic views: top front and right side.
- f. Interpret an orthographic projection.
- g. Compare and contrast first and third angle projection.
- h. Identify auxiliary views including primary, secondary and tertiary.
- i. Identify additional views including enlarged, sectional, partial and rotated.
- j. Describe the unique characteristics of orthographic views and airplanes including air plane views and referenced planes (station, buttock line water line wing reference planes).

5) The student will be able to interpret blueprint lines.

- a. Describe blueprint line standards including object, hidden, center, dimension, extension, leader, break, section, phantom, stitch, cutting plane and viewing plane.
- b. Identify the standards of line precedence.
- c. Interpret a product based upon a line drawing.
- d. Interpret hidden features on a blueprint drawing.
- e. Identify other views of a product on the blueprint drawing

6) The student will be able to identify dimension and tolerance on blueprints and its application in manufacturing.

- a. Identify the different types of dimensions; dimension of size and dimension of position.
- b. Describe the components of dimensions; extension lines, dimension lines and dimension.
- c. Identify dimension of angles.
- d. Define tolerance and its role.
- e. Describe methods of displaying tolerance and their role; plus and minus, maximum and minimum, maximum, minimum.
- f. Explain the purpose of dimension lines and extension lines.
- g. Identify different dimensioning methods used in product drawings including chain and baseline or datum dimensioning, arcs and radius, typical dimensions and rivet location dimensions.

- 7) The student will be able to interpret common GD&T symbols on a blueprint.
 - a. Identify the role of symbols on a blueprint.
 - b. Define G D & T
 - c. Define the product datum and its role including primary, secondary and tertiary datum's.
 - d. Identify types of G D & T symbols including characteristic and modifying.
 - e. Identify the categories of characteristic symbols including; individual part, individual and related, and related only.

- 8) The student will be able to interpret common fastener symbols on a blueprint.
 - a. Identify the role of fastener symbols on a blueprint.
 - b. Identify type of fasteners specified on a blueprint; permanent and removable
 - c. Describe the permanent fastener id system: quadrants
 - d. Describe how removable fasteners are indicated on blueprint
 - e. Identify the tooling hole symbol and its role.
 - f. Locate product feature symbols on a product drawing.

- 9) The student will be able to interpret common aircraft symbols on a blueprint.
 - a. Identify the role of aircraft symbols on a blueprint
 - b. Identify common symbols including center line, flag note, directional indicator, K or coordinating hole, engineered tooling, station indicators, limited release.

- 10) *The student will achieve an average of 3.0 on the Employability Skills Competency Profile.

MINIMUM COURSE CONTENT

The following topics must be included in this course. Additional topics may also be included.

- I. The student will be able to discuss the basics concepts associated with blueprints
- II. The student will be able to utilize a production drawing in the
- III. The student will be able identify terminology common to blueprints and explain their relationships.
- IV. The student will be able to compare and contrast the elements of blueprint views.
- V. The student will be able to interpret blueprint lines
- VI. The student will be able to identify dimension and tolerance on blueprints and its application in manufacturing.
- VII. The student will be able to interpret common G D & T symbols on a blueprint.
- VIII. The student will be able to interpret common fastener symbols on a blueprint.
- IX. The student will be able to interpret common aircraft symbols on a blueprint
- X. Review Employability Skills

STUDENT REQUIREMENTS AND METHOD OF EVALUATION

INSTRUCTIONAL METHODS

1. Lecture
2. Example and demonstration
3. Review of student applications
4. Computerized skills tests (performance-based)

STUDENT REQUIREMENTS

Evaluation of student performance is determined primarily from results of written and performance tests to validate mastery of course competencies. Due to the nature of the class, student participation, teamwork, courtesy, and adherence to policies are required. Students are required to take the 3rd party testing examination.

GRADE SCALE

- A = 90 to 100%
- B = 80 to 89%
- C = 70 to 79%
- D = 60 to 69%
- F = 59% and below

ASSESSMENT OF STUDENT GAIN

Students will be assessed through written testing. Practical application will be assessed on the first attempt at the skill and again at the conclusion of the course. Comparison will determine the extent of student gain.

Attendance Policy

1. NCCC values interactive learning which promotes student engagement in the learning process. To be actively engaged, the student must be present in the learning environment.
2. Unless students are participating in a school activity or are excused by the instructor, they are expected to attend class. If a student's absences exceed one-eighth of the total course duration, (which equates to one hundred (100) minutes per credit hour in a face-to-face class) the instructor has the right, but is not required, to withdraw a student from the course. Once the student has been dropped for excessive absences, the registrar's office will send a letter to the student, stating that he or she has been dropped. A student may petition the chief academic officer for reinstatement by submitting a letter stating valid reasons for the absences within one week of the registrar's notification. If the student is reinstated into the class, the instructor and the registrar will be notified. Please refer to the Student Handbook/Academic Policies for more information

3. Absences that occur due to students participating in official college activities are excused except in those cases where outside bodies, such as the State Board of Nursing, have requirements for minimum class minutes for each student. Students who are excused will be given reasonable opportunity to make up any missed work or receive substitute assignments from the instructor and should not be penalized for the absence. Proper procedure should be followed in notifying faculty in advance of the student's planned participation in the event. Ultimately it is the student's responsibility to notify the instructor in advance of the planned absence.

ACADEMIC INTEGRITY

NCCC expects every student to demonstrate ethical behavior with regard to academic pursuits. Academic integrity in coursework is a specific requirement. Definitions, examples, and possible consequences for violations of Academic Integrity, as well as the appeals process, can be found in the College Catalog, Student Handbook, and/or Code of Student Conduct and Discipline.

ELECTRONIC DEVICE POLICY

Student cell phones and other personal electronic devices not being used for class activities must not be accessed during class times unless the instructor chooses to waive this policy.

NOTE

Information and statements in this document are subject to change at the discretion of NCCC. Students will be notified of changes and where to find the most current approved documents.

ACCOMMODATIONS

If you are a student with a disability who may need accommodation(s), in compliance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) of 1990, please notify the Dean of Student Services in the Student Services Office, Sanders Hall, 620-432-0304, on the Chanute Campus, or the Dean for the Ottawa and Online Campuses, 785-248-2798, on the Ottawa Campus as soon as possible. You will need to bring your documentation for review in order to determine reasonable accommodations, and then we can assist you in arranging any necessary accommodations.

NON-DISCRIMINATION POLICY

The following link provides information related to the non-discrimination policy of NCCC, including persons with disabilities. Students are urged to review this policy.

<http://www.neosho.edu/Departments/NonDiscrimination.aspx>

SEXUAL MISCONDUCT POLICY (TITLE IX)

At NCCC, it is the responsibility of an instructor to help create a safe learning environment in the classroom, including both physical and virtual classrooms. All instructors are considered mandatory reporters at NCCC, therefore any information regarding sexual misconduct that is shared by a student in one-on-one meetings with the instructor must be reported to appropriate personnel at the College. Instructors will keep the information private to the greatest extent possible, but it is not confidential. Generally, climate surveys, classroom writing assignments or discussions, human subjects research, or events such as Take Back the Night events do not provide notice that must be reported to the Coordinator by employees, unless the reporting party clearly indicates that they wish a report to be made.

The following link provides information related to the sexual misconduct policy of NCCC, including resources, reporting options, and student rights. Students are urged to review this policy.

<http://www.neosho.edu/TitleIX.aspx>

COURSE NOTES

I understand that this course utilizes computer-based modules and each phase of the module must be successfully completed in order to progress to the next phase.

I understand that this course is one course in a series of courses in the Aerostructures Program. I must successfully complete this course and all other computer module courses in the program in order to advance into the Aerostructures Assembly (lab) course.

Additionally, I understand that I must pass the Aerostructures Assembly (lab) course at 80% competency or better to receive the official program certificate.

SIGNATURE

DATE