

**NEOSHO COUNTY COMMUNITY COLLEGE
MASTER COURSE SYLLABUS**

COURSE IDENTIFICATION

Course Code/Number: AERO 114

Course Title: Precision Instruments

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

Credit Hour(s): One (1)

Effective Date: Fall 2013

Assessment Goal Per Outcome: 80%

COURSE DESCRIPTION

This course is worth 1 hour of college credit. It includes basic concepts and terminology that is related to precision instruments. Students will learn to utilize a precision rule, dial caliper, vernier micrometer, small hole gauge, counter sink gauge, grip gauges, and rivet height gauges.

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 be able to apply basic concepts and terminology to precision instruments.
 - a. Define terminology associated with instrumentation: precision, accuracy calibration setting master, zero setting, tool discrimination, and resolution.
 - b. Identify the impact of weather, cleanliness, instrument quality, tool usage on precision and accuracy.
 - c. Identify the role of NIST national Institute for Standards and Technology.
 - d. Identify the three principles of measurement: reference point, measurement point, measurement distance.
 - e. Describe the relationship between the principles of measurement and the blueprint or engineering specifications.
 - f. Identify the basics of using precision measurement tools.
- 2) The student will be able to effectively utilize a precision rule.
 - a. Define terminology; rule, measurement scale, graduation line, secondary graduation lines.
 - b. Compare and contrast rule and ruler.
 - c. Identify the key components of the precision rule.
 - d. Interpret a rule's graduation lines.
 - e. Identify rules based upon their measurement scale.
 - f. Choose which type of precision rule to measure a length.
 - g. Utilize a precision rule to measure a length.
 - h. Identify steps to care for a precision rule.
- 3) The student will be able to effectively utilize a vernier micrometer.
 - a. Define the role of micrometers.
 - b. Compare and contrast vernier micrometer and regular micrometer.

- c. Identify all the components of a vernier micrometer: anvil, lock level, frame, sleeve, spindle, thimble, micrometer screw.
 - d. Describe how the components work together to measure a product.
 - e. Interpret the graduation scales; primary graduation line, secondary graduation line, vernier graduation scale.
 - f. Use a vernier micrometer to accurately measure a distance.
 - g. Check the calibration on vernier micrometer.
 - h. Identify the steps to care for a vernier micrometer.
- 4) The student will be able to effectively utilize small hole gauge.
- a. Define the role of full ball and half ball small hole gauges and their roles.
 - b. Identify all the components of a small hole gauge; ball, handle, wedge, thimble.
 - c. Describe how the components work together to measure.
 - d. Use the small hole gauge to measure a diameter and a width.
 - e. Identify the steps to care for a small hole gauge.
- 5) The student will be able to effectively utilize a countersink gauge.
- a. Define counter sink, counter sink gauge, countersink angle.
 - b. Identify the components of a countersink gauge; body, setting ring, plunger, dial indicator (dial face, dial needle, dial lock).
 - c. Describe how the components work together to measure a product.
 - d. Zero set countersink gauge.
 - e. Use the countersink gauge to measure a diameter.
 - f. Identify the step to care for a countersink gauge.
- 6) The student will be able to effectively utilize grip gauges.
- a. Identify a grip gauge and its role.
 - b. Identify rivet terminology including clinch, grip range, and grip, and grip range value.
 - c. Identify all the components of a grip gauge; body, measurement slide, measurement point, measurement scale, rivet diameter measurement holes, lip, graduation lines.
 - d. Describe how the components work together to determine.
 - e. Utilize the grip gauge to calculate CherryMax rivet length.
 - f. Identify the steps to care for a grip gauge.
- 7) The student will be able to effectively utilize rivet height gauges.
- a. Identify the role of rivet height gauge.
 - b. Identify rivet height and tolerance.
 - c. Identify the components of a rivet height gauge; plunger, body, dial indicator (dial face, needle, lock).
 - d. Describe how the components work together to determine rivet height.
 - e. Zero set rivet height gauge.

- f. Utilize the rivet height gauge to measure rivet height.
- g. Identify the steps to care for a rivet height gauge.

8) *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 apply basic concepts and terminology to precision instruments
- II. The student will be able to utilize a precision rule.
- III. The student will be able to utilize vernier micrometer.
- IV. The student will be able utilize small hole gauge.
- V. The student will be able utilize countersink gauge.
- VI. The student will be able to utilize grip gauges.
- VII. The student will be able to utilize rivet height gauges.
- VIII. 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