

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

MATHEMATICS 121 – QUANTITATIVE REASONING FOR CAREER EDUCATION

3 hours lecture, 3 units

Catalog Description

A mathematics course designed to develop the computational skills needed in many Career Education (CE) programs. Topics include geometry, measurement, number sense, estimation, basic statistics, trigonometric functions, and critical thinking skills.

Prerequisite

None

Course Content

- 1) Simplify arithmetic expressions using order of operations
- 2) Read and use measuring tools (for measurements & tolerances)
- 3) Estimate and approximate quantities by rounding
- 4) Convert between units
- 5) Scale using ratios, proportions, and variations
- 6) Read and analyze application problems
- 7) Produce accurate illustrations
- 8) Inspect solutions for accuracy
- 9) Compute perimeters, areas, and volumes
- 10) Solve formulas for unknown quantities
- 11) Measure angles
- 12) Apply the Pythagorean theorem
- 13) Apply trigonometric relationships
- 14) Evaluate and apply different measures of center of data
- 15) Read and interpret graphs
- 16) Use statistics to make decisions

Course Objectives

Students will be able to:

- 1) apply critical thinking skills to establish relationships between skilled trades problems and mathematical processes needed to evaluate the problem;
- 2) generate an accurate estimate of the amount of material needed for a job and the material's cost;
- 3) develop proficiency with using fractions as it relates to common skilled trades;
- 4) Apply the role of trigonometry used in computer calculations;
- 5) demonstrate and properly use units of measure;
- 6) describe different measures of center and why each are used;
- 7) read and interpret different graphs of data; and
- 8) Use descriptive statistics when making decisions.

Method of Evaluation

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in the subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

- 1) Group or Individual Project(s), class activities, homework exercises, and exam questions which measure students' ability to explore and represent information.
- 2) In-class activities, homework, math notebook, and data analysis projects which demonstrate students' ability to apply effective learning strategies to a skilled trade.
- 3) CE comprehensive exams will be considered for evaluations.

Special Materials Required of Student

- 1) Scientific or graphing calculator

Minimum Instructional Facilities

- 1) Smart classroom with writing boards covering all available walls, overhead projector, graphing utility software, projection screen

Method of Instruction

- 1) Individualized instruction: computer aided instruction or in-class individualized instruction
- 2) Collaborative learning: group work or peer review student work
- 3) Modeling: instructor led-demonstrations and discussion or guided-discovery
- 4) Active learning: use of manipulatives, interactive computer-based instruction, or in-class activities requiring student participation
- 5) Class activities and assignments developed by Cuyamaca math faculty

Out-of-Class Assignments

- 1) Problem sets
- 2) Exploratory activities and/or projects
- 3) Reading and/or writing assignments

Texts and References

- 1) Required (representative examples):
 - a. Saunders & Carman. *Mathematics for the Trades: A Guided Approach*. 11th edition. Pearson, 2018.
 - b. Classroom activities developed by Cuyamaca College math faculty.
- 2) Supplemental: None

Student Learning Outcomes

Upon successful completion of this course, students will be able to:

- 1) Use analytical, numerical, graphical, and statistical methods to solve trade problems.
- 2) Solve multi-disciplinary trade applications and interpret the results in context.
- 3) Communicate the results of tests results to industry standards using technical writing skills.

*For the complete list of learning objectives, please see the Course Objectives section