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|---|---|---|---|
| 3/13/2023 | DATE | TEC | DIVISION |
| ☑ | REQUIRED COURSE | ☐ | NEW COURSE |
| ☐ | ELECTIVE COURSE | ☑ | REVISION |

# Lake Land College

## Course Information Form

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|---|---|---|---|
| COURSE NUMBER: | TEC-048 | TITLE: *(30 Characters Max)* | Applied Shop Computations |

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|---|---|---|---|---|---|---|---|
| SEM CR HRS: | 3 | Lecture: | 3 | Lab: | 0 | ECH: | 3 |
| Course Level: | ☐ Gen Ed / IAI ☐ Baccalaureate /Non-IAI ☑ Career/Technical ☐ Dev Ed/ Not in Degree Audit | Clinical Practicum: | 0 | Work-based Learning: | 0 | WBL ECH: | 0 |
| COURSE PCS # | 12 - 27.0301 | IAI Code | | Contact Hours (Minutes/Week) | | | |
| Repeatable (Y/N): N | Pass/Fail (Y/N): N | Variable Credit (Y/N): N | Min: | Max: | 16 Wks: 150 | 8 wks: 300 | |

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| Prerequisites: | None |
| Corequisites: | None |
| Catalog Description: (40 Word Limit) | Focuses on basic arithmetic and calculations necessary for solving shop oriented problems involving ratio, proportion, percent, units conversion and algebra. |

| List the Major Course Segments (Units) | Contact Lecture Hours | Contact Lab Hours | Clinical Practicum | Work-based Learning |
|---|---|---|---|---|
| Whole numbers | 5 | | | |
| Common fractions | 6 | | | |
| Decimals | 5 | | | |
| Ratio and proportion | 3 | | | |
| Percent | 3 | | | |
| Signed numbers | 6 | | | |
| Precision and accuracy | 2 | | | |
| English measurement units | 4 | | | |
| Metric measurement units | 5 | | | |
| Algebra | 6 | | | |
| TOTAL | 45 | 0 | 0 | 0 |

### EVALUTION

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|---|---|---|---|
| QUIZZES ☑ | EXAMS ☑ | ORAL PRES ☐ | PAPERS ☐ |
| LAB WORK ☐ | PROJECTS ☐ | COMP FINAL ☑ | OTHER ☑ |

### COURSE MATERIALS

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|---|---|---|
| TITLE: | *Introductory Technical Mathematics* | |
| AUTHOR: | John Peterson, Robert D. Smith | |
| PUBLISHER: | Delmar | |
| VOLUME/EDITION/URL: | 6th | |
| COPYRIGHT DATE: | 2013 | |

| MAJOR COURSE SEGMENT | HOURS | LEARNING OUTCOMES |
|---|---|---|
| | | *The student will be able to:* |
| Whole numbers (1-1 to 1-12) | 5 | 1. Express the digit place values of whole numbers.<br>2. Write whole numbers in expanded form.<br>3. Estimate answers.<br>4. Arrange, add, subtract, multiply, and divide whole numbers.<br>5. Solve practical problems using addition, subtraction, multiplication, and division.<br>6. Solve problems by combining addition, subtraction, multiplication, and division.<br>7. Solve arithmetic expressions by applying the proper order of operations.<br>8. Solve problems with formulas by applying the proper order of operations. |

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| Common fractions (2-1 to 2-18) | 6 | 1. Express fractions as equivalent fractions.<br>2. Express fractions in lowest terms.<br>3. Express mixed numbers as improper fractions.<br>4. Determine lowest common denominators.<br>5. Add, subtract, multiply, and divide fractions.<br>6. Add and subtract combinations of fractions, mixed numbers, and whole numbers.<br>7. Multiply and divide combinations of fractions, mixed numbers, and whole numbers.<br>8. Solve practical problems by combining addition, subtraction, multiplication, and division.<br>9. Simplify arithmetic expressions with combined operations by applying the proper order of operations.<br>10. Solve practical combined operations problems involving formulas by applying the proper order of operations. |
| Decimals (3-1 to 3-20) | 5 | 1. Write decimal numbers in word form.<br>2. Write numbers expressed in word form as decimal numbers.<br>3. Express common fractions as decimals.<br>4. Express decimals as common fractions.<br>5. Add, subtract, multiply and divide decimals.<br>6. Solve problems using individual operations of addition, subtraction, multiplication and division of decimals.<br>7. Solve practical problems by combining addition, subtraction, multiplication and division of decimals.<br>8. Determine the root of any positive number.<br>9. Solve practical problems by using powers and roots.<br>10. Solve practical problems by using power and root operations in combination with one or more additional arithmetic operations. |
| Ratio and proportion (4-1 to 4-5) | 3 | 1. Write comparisons as ratios.<br>2. Solve applied ratio problems.<br>3. Solve for the missing terms of given proportions.<br>4. Solve proportion problems by substituting values in formulas.<br>5. Analyze problems to determine whether they are direct or inverse proportions, set up proportions and solve for unknowns. |
| Percent (5-1 to 5-10) | 3 | 1. Express decimals and common fractions as percents.<br>2. Express percents as decimals and common fractions.<br>3. Determine the percentage, given the base and rate.<br>4. Determine the rate, given the percentage and base.<br>5. Determine the base, given the rate and percentage.<br>6. Solve more complex percentage problems in which two of the three parts are not directly given. |
| Signed numbers (6-1 to 6-3 & 6-5 to 6-12) | 6 | 1. Express word statements as signed numbers.<br>2. Write signed number values using a number scale.<br>3. Add and subtract signed numbers.<br>4. Multiply and divide signed numbers.<br>5. Compute powers and roots of signed numbers.<br>6. Solve combined operations of signed numbers.<br>7. Solve signed number problems.<br>8. Express decimal numbers in scientific notation.<br>9. Express numbers written in scientific notation as decimal numbers.<br>10. Compute expressions using scientific notation. |
| Precision and accuracy (7-1 to 7-7) | 2 | 1. Determine the degree of precision of any measurement number.<br>2. Round sums and differences of measurement numbers to proper degrees of precision.<br>3. Determine the number of significant digits of measurement numbers. |

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| English measurement units (8-1 to 8-14) | 4 | 1. Express lengths as smaller or larger English linear compound numbers.<br>2. Perform arithmetic operations with English linear units and compound numbers.<br>3. Express given English length, area, and volume units in larger and smaller units.<br>4. Express given English capacity and weight units as larger and smaller units.<br>5. Solve practical applied English length, area, volume, capacity, and weight problems.<br>6. Express English compound unit measures as equivalent compound unit measures.<br>7. Solve practical applied compound unit measures problems. |
| Metric measurement units (9-1 to 9-16 & 9-18) | 5 | 1. Express lengths as smaller or larger metric linear compound numbers.<br>2. Perform arithmetic operations with metric linear units and compound numbers.<br>3. Select appropriate linear metric units in various applications.<br>4. Express given metric length, area, and volume units in larger and smaller units.<br>5. Express given metric capacity and weight units as larger and smaller units.<br>6. Solve practical applied metric length, area, volume, capacity, and weight problems.<br>7. Express metric compound unit measures as equivalent compound unit measures.<br>8. Solve practical applied compound unit measures problems.<br>9. Convert between English measures and metric measures. |
| Algebra (12-1 to 12-3 & 13-1 to 13-9) | 6 | 1. Express word statements as algebraic expressions.<br>2. Express diagram values as algebraic expressions.<br>3. Evaluate algebraic expressions by substitution given numbers for letter values.<br>4. Solve formulas by substituting numbers for letters, word statements, and diagram values.<br>5. Add and subtract single and multiple literal terms.<br>6. Multiply and divide single and multiple literal terms.<br>7. Compute powers of single and multiple literal terms.<br>8. Compute roots of single literal terms.<br>9. Remove parentheses that are preceded by plus or minus signs.<br>10. Simplify combined operations of literal term expressions.<br>11. Solve literal term problems. |
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| Outcomes* | At the successful completion of this course, students will be able to: |
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| Course Outcome 1 | Complete applied mathematical computations with whole numbers, fractions, and decimals. |
| Course Outcome 2 | Solve applied proportion problems. |
| Course Outcome 3 | Solve applied percent problems. |
| Course Outcome 4 | Convert units of measurement. |
| Primary Laker Learning Competency | |
| Secondary Laker Learning Competency | |

**Course and program outcomes will be used in the software for outcomes assessment and should include at least 1 primary and 1 secondary Laker Learning Competency. Limit to 3-5.*