

## SYLLABUS

<b>DATE OF LAST REVIEW:</b>	09/2019
<b>CIP CODE:</b>	41.0303
<b>SEMESTER</b>	Departmental Syllabus
<b>COURSE TITLE:</b>	Manufacturing Technician Training
<b>COURSE NUMBER:</b>	BMFR 0145
<b>CREDIT HOURS:</b>	3
<b>INSTRUCTOR:</b>	Departmental Syllabus
<b>OFFICE LOCATION:</b>	Science Building Room 2403
<b>TELEPHONE:</b>	Departmental Syllabus
<b>OFFICE HOURS:</b>	Departmental Syllabus
<b>PREREQUISITES</b>	Meet qualifying scores on Accuplacer Accuplacer Reading score - 240

### **REQUIRED TEXT AND MATERIALS:**

Please check with the KCKCC bookstore, <http://www.kckccbookstore.com/>, for the required texts for your particular class.

**COURSE DESCRIPTION:** The Manufacturing Technician Training course will provide students an understanding of industrial Lean manufacturing, Safety, and some of the physics of behind machines. These include levers, pulley systems, hydraulics, and electricity. Students will also learn to interpret two dimensional drawings into three dimensional structures.

**METHOD OF INSTRUCTION:** A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, and panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

**EXPECTED LEARNER OUTCOMES:**

- A. Apply different method of measurement for different materials
- B. Use algebra for manufacturing based math problems.
- C. Apply basic math skills to monitor production efficiency and quality.
- D. Use Spatial Reasoning to translate 2D schematic drawing into 3D structures.
- E. Understand the mechanics of machines
- F. Understand fundamentals of fluid power and thermodynamics.
- G. Understand basic wiring and electrical power in electric motors and generators.
- H. Apply basic chemistry in media production.
- I. Understand Manufacturing Processes & Control.
- J. Practice and implement Quality and Lean Manufacturing Concepts
- K. Apply SPC statistical analyses to monitor processes.
- L. Understand the monetary impact of everyday activity on business.

**COURSE COMPETENCIES:**

- A. Apply different method of measurement for different materials
  - 1. Be able to use a decimal inch machinist's ruler to measure a length
  - 2. Use a U.S. ruler and tape measure to measure a length
  - 3. Use a metric ruler and tape to measure length.
  - 4. Measure liquids/weights in metric and U.S. customary units
  - 5. Apply basic math skills to convert between common fraction Inches and decimal Inches.
  - 6. Convert between U.S. customary units and SI metric units.
- B. Use algebra for manufacturing based math problems.
  - 1. Perform correct order of operation to simplify mathematical expressions.
  - 2. Generate linear equations with one unknown for situations described in text.
  - 3. Solve simple linear equations with one unknown.
- C. Apply basic math skills to monitor production efficiency and quality.
  - 1. Read and interpret histograms, bar charts, line graphs, and scatter plots.
  - 2. Interpret descriptive statistics: Mean median, mode, and range.
  - 3. Demonstrate qualitative reasoning for situations involving statistical data and probabilities.
- D. Use Spatial Reasoning to translate 2D schematic drawing into 3D structures.
  - 1. Visually translate from 2D drawings to 3D images and back
  - 2. Identifying different views for given isometric drawing of an object.
  - 3. Identifying the different elements of an object in various views
  - 4. Predict behavior of visual representations of simple mechanisms
- E. Understand the mechanics of machines
  - 1. Demonstrate qualitative reasoning about mechanical force and systems involving pulleys, levers, and gears.
  - 2. Determine mechanical advantage of different systems of pulleys
  - 3. Determine effects of different lever configurations on the force required to lift an object
  - 4. Generate different configurations of gears and axels to increase power or speed.

- F. Understand fundamentals of fluid power and thermodynamics.
  - 1. Generate causal explanations of behavior of:
    - (a) simple systems involving changes in pressure, temperature and volume,
    - (b) simple hydraulic/pneumatic devices and
    - (c) principles of heat transfer.
  - 2. Predict the effects of changes in pressure on volume and temperature
  - 3. Predict the effects of changes in temperature on volume and pressure
  - 4. Predict the mechanical advantage of simple hydraulic and pneumatic systems.
  
- G. Understand basic wiring and electrical power in electric motors and generators.
  - 1. Generate causal explanations of the relationship between electrical and magnetic forces and explanations of how electric motors, generators, solenoids, and relay switches behave.
  - 2. Generate causal explanations and predictions of electric circuit behavior involving simple series and parallel circuits containing relays, capacitors, resistors and simple devices such as light bulbs and pumps.
  
- H. Apply basic chemistry in media production.
  - 1. Core Concepts: Classify substances as a molecule, element, mixture, or compound; classify changes in substances as chemical reaction, mixture, or physical change; classify and apply characteristics acids and bases; interpret the periodic chart; and classify methods for separating mixtures (filtration, evaporation, distillation).
  - 2. Chemical Reactions: Explain chemical bonding and structural changes that take place in common chemical reactions and interpret chemical formulas and equations.
  - 3. Polymers: Generate explanations of molecular structural difference and physical characteristics between common types of polymers such as slime, flexi-putty, rubber and plastic bags.
  
- I. Understand Manufacturing Processes & Control.
  - 1. Generates the Sequence of Operation and a Flow Diagram for production tasks and processes.
  - 2. Generate explanations of how electrical mechanical controls and sensors operate in simple systems and devices.
  - 3. Create flow charts for models (mock-up) of simple computer controlled systems such as a traffic light or washing machine.
  
- J. Practice and implement Quality and Lean Manufacturing Concepts
  - 1. Identify descriptions of manufacturing quality and lean production initiatives as examples of
  - 2. value stream mapping, waste elimination, 5S, DMAIC, and Total Productive Maintenance (TPM)
  - 3. Create a process map and value stream map to improve a process or reduce waste
  - 4. Demonstrate using a industry standard problem solving method such as DMAIC for improving production processes. Currently using DMAIC

- K. Apply SPC statistical analyses to monitor processes.
  - 1. Determine plausible causes in fluctuations in processes based on statistical information (mean, range, & variation patterns)
  
- L. Understand the monetary impact of everyday activity on business.
  - 1. Predict how actions, strategies, and decisions impact the bottom line.
  - 2. Classify examples of common business financial terms.

**SPECIAL NOTES:**

This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student's progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

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All enrolled students at Kansas City Kansas Community College are subject to follow all rules, conditions, policies and procedures as described in both the Student Code of Conduct as well as the Student Handbook. All Students are expected to review both of these documents and to understand their responsibilities with regard to academic conduct and policies. The Student Code of Conduct and the Student Handbook can be found on the KCKCC website.

*Kansas City Kansas Community College complies with the Americans with Disabilities Act. If you need accommodations due to a documented disability, please contact the disabilities services office at (913) 288 -7664.*