Course Outcome Summary

Required Program Core Course

MECH 221 (CAD/CAM Lathe)

Course Information
Division   ASET
Contact Hours   60
Total Credits   3

Prerequisites   MECH 201

Course Description

CAD/CAM Lathe consists of part-oriented tutorials, and practice exercises that provide students with an excellent foundation in Lathe. The material emphasizes the machinability of parts with suggested fixtures, setup sheet, and more. CAD/CAM Lathe is ideal for beginners and current Mastercam users. Step-by-step tutorials introduce 2D geometry creation along with detailed coverage of 2D toolpaths such as Face, Rough, Finish, Drilling, Grooving, Grooving on an angle, Inside Boring, Cutoff, Threading, and Canned Cycles for Rough and Finish. Appropriate terminology is used and theory and practice of safe work methods will be emphasized.

This course is a required core course for students pursuing an AAS in Product and Process Technology.

Program Outcomes Addressed by this Course:

Upon successful completion of this course, students should be able to meet the program outcomes listed below:
  A. Demonstrate safe operation and practices of equipment.
  B. Specify proper Personal Protective Equipment (PPE) required for applicable work environments.
  C. Identify the complete design and the process, from concept to completion.
  D. Identify the major functions of a manufacturing system, their characteristics, relationship to design, process routing and lean manufacturing.
  E. Demonstrate computer competency required for CAM applications including CNC programming, set up, data transmission and the use of CAD/CAM editing software.
  F. Analyze, apply and qualify engineering specifications for parts machined, prototyped or fabricated.
  G. Analyze, design and add or remove material for physical systems in emerging fields, including medical applications, alloyed metals, composites and exotic materials.
  H. Plan, design and implement the sequence of operations including tooling, machines, time studies, automation and robotic integrated manufacturing.

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Course Outcomes

In order to evidence success in this course, the students will be able to:

1. Create the part geometry.
   Program outcomes linked:
   > A. Demonstrate safe operation and practices of equipment.
   > B. Specify proper Personal Protective Equipment (PPE) required for applicable work environments.
   > C. Identify the complete design and the process, from concept to completion.
   > D. Identify the major functions of a manufacturing system, their characteristics, and relationship to design, process routing and lean manufacturing.
   > E. Demonstrate computer competency required for CAM applications including CNC programming, set up, data transmission and the use of CAD/CAM editing software.
   > F. Analyze, apply and qualify engineering specifications for parts machined, prototyped or fabricated.
   > G. Analyze, design and add or remove material for physical systems in emerging fields, including medical applications, alloyed metals, composites and exotic materials.
   > H. Plan, design and implement the sequence of operations including tooling, machines, time studies, automation and robotic integrated manufacturing.

2. Select the correct machine and set up the stock.
   Program outcomes linked:
   > A. Demonstrate safe operation and practices of equipment.
   > B. Specify proper Personal Protective Equipment (PPE) required for applicable work environments.
   > C. Identify the complete design and the process, from concept to completion.
   > D. Identify the major functions of a manufacturing system, their characteristics, and relationship to design, process routing and lean manufacturing.
   > E. Demonstrate computer competency required for CAM applications including CNC programming, set up, data transmission and the use of CAD/CAM editing software.
   > F. Analyze, apply and qualify engineering specifications for parts machined, prototyped or fabricated.
   > G. Analyze, design and add or remove material for physical systems in emerging fields, including medical applications, alloyed metals, composites and exotic materials.
   > H. Plan, design and implement the sequence of operations including tooling, machines, time studies, automation and robotic integrated manufacturing.

3. Select the tool settings and set up the stock.
   Program outcomes linked:
   > A. Demonstrate safe operation and practices of equipment.
   > B. Specify proper Personal Protective Equipment (PPE) required for applicable work environments.
   > C. Identify the complete design and the process, from concept to completion.
   > D. Identify the major functions of a manufacturing system, their characteristics, and relationship to design, process routing and lean manufacturing.
   > E. Demonstrate computer competency required for CAM applications including CNC programming, set up, data transmission and the use of CAD/CAM editing software.
   > F. Analyze, apply and qualify engineering specifications for parts machined, prototyped or fabricated.
   > G. Analyze, design and add or remove material for physical systems in emerging fields, including medical applications, alloyed metals, composites and exotic materials.
   > H. Plan, design and implement the sequence of operations including tooling, machines, time studies, automation and robotic integrated manufacturing.

4. Backplot the toolpaths.
    A. Demonstrate safe operation and practices of equipment.
    B. Specify proper Personal Protective Equipment (PPE) required for applicable work environments.
    C. Identify the complete design and the process, from concept to completion.
    D. Identify the major functions of a manufacturing system, their characteristics, and relationship to design, process routing and lean manufacturing.
    E. Demonstrate computer competency required for CAM applications including CNC programming, set up, data transmission and the use of CAD/CAM editing software.
    F. Analyze, apply and qualify engineering specifications for parts machined, prototyped or fabricated.
    G. Analyze, design and add or remove material for physical systems in emerging fields, including medical applications, alloyed metals, composites and exotic materials.
    H. Plan, design and implement the sequence of operations including tooling, machines, time studies, automation and robotic integrated manufacturing.

5. Simulate the toolpaths in verify.
    Program outcomes linked:
    A. Demonstrate safe operation and practices of equipment.
    B. Specify proper Personal Protective Equipment (PPE) required for applicable work environments.
    C. Identify the complete design and the process, from concept to completion.
    D. Identify the major functions of a manufacturing system, their characteristics, and relationship to design, process routing and lean manufacturing.
    E. Demonstrate computer competency required for CAM applications including CNC programming, set up, data transmission and the use of CAD/CAM editing software.
    F. Analyze, apply and qualify engineering specifications for parts machined, prototyped or fabricated.
    G. Analyze, design and add or remove material for physical systems in emerging fields, including medical applications, alloyed metals, composites and exotic materials.
    H. Plan, design and implement the sequence of operations including tooling, machines, time studies, automation and robotic integrated manufacturing.

6. Run the post processor to obtain the G-code file.
    Program outcomes linked:
    A. Demonstrate safe operation and practices of equipment.
    B. Specify proper Personal Protective Equipment (PPE) required for applicable work environments.
    C. Identify the complete design and the process, from concept to completion.
    D. Identify the major functions of a manufacturing system, their characteristics, and relationship to design, process routing and lean manufacturing.
    E. Demonstrate computer competency required for CAM applications including CNC programming, set up, data transmission and the use of CAD/CAM editing software.
    F. Analyze, apply and qualify engineering specifications for parts machined, prototyped or fabricated.
    G. Analyze, design and add or remove material for physical systems in emerging fields, including medical applications, alloyed metals, composites and exotic materials.
    H. Plan, design and implement the sequence of operations including tooling, machines, time studies, automation and robotic integrated manufacturing.

7. Saving part files and crating libraries.
   Program outcomes linked:

   A. Demonstrate safe operation and practices of equipment.

   B. Specify proper Personal Protective Equipment (PPE) required for applicable work environments.

   C. Identify the complete design and the process, from concept to completion.

   D. Identify the major functions of a manufacturing system, their characteristics, and relationship to design, process routing and lean manufacturing.

   E. Demonstrate computer competency required for CAM applications including CNC programming, set up, data transmission and the use of CAD/CAM editing software.

   F. Analyze, apply and qualify engineering specifications for parts machined, prototyped or fabricated.

   G. Analyze, design and add or remove material for physical systems in emerging fields, including medical applications, alloyed metals, composites and exotic materials.

   H. Plan, design and implement the sequence of operations including tooling, machines, time studies, automation and robotic integrated manufacturing.

Date Updated: 3/13/2020
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