



Syllabus

MET 230 Jig & Fixture Design

General Information

Date

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Author

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Department

Science and Technology

Course Prefix

MET

Course Number

230

Course Title

Jig & Fixture Design

Course Information

Credit Hours

3

Lecture Contact Hours

1

Lab Contact Hours

4

Other Contact Hours

0

Catalog Description

This course will provide the students with the necessary skills needed to design manufacturing and testing support equipment. The course will discuss theory and provide practice in a series of design assignments.

Key Assessment

This course does not contain a Key Assessment for any programs

Prerequisites

None

Co-requisites

None

Grading Scheme

Letter

First Year Experience/Capstone Designation

This course DOES NOT satisfy the outcomes applicable for status as a FYE or Capstone.

SUNY General Education

This course is designated as satisfying a requirement in the following SUNY Gen Ed category

None

FLCC Values

Institutional Learning Outcomes Addressed by the Course

Course Learning Outcomes

Course Learning Outcomes

1. Describe the unique constraints necessary for tool design
2. Demonstrate the methods for supporting a work piece for manufacturing, assembly or testing/inspecting.

Program Affiliation

This course is not required as a core course in a program

Outline of Topics Covered

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- I. Purpose of Tool Design
 - o Tool Drawings
 - o Tool Design Objectives
 - o Planning the Design

- II. Types and Functions of Jigs and Fixtures
 - o Jig and Fixture Design
 - o Class of Jigs
 - o Types of Jigs
 - o Types of Fixtures
 - o Classification of Fixtures

- III. Support and Locating Principles
 - o Referencing
 - o Basic Rules of Locating
 - o Planes of Movement
 - o Locating the Work

- IV. Clamping and Holding Principles
 - o Workholders
 - o Basic Rules of Clamping
 - o Types of Clamps
 - o Non-Mechanical Clamping
 - o Special Clamping Operations

V. Basic Construction Principles

- o Tool Bodies
- o Preformed Materials
- o Drill Bushings
- o Set Blocks
- o Fastening Devices

VI. Design Economics

- o Considerations of Design Economics
- o Design Economics
- o Design Economy
- o Economic Analysis
- o Comparative Analysis

VII. Developing the Initial Design

- o Predesign Analysis
- o Designing Around the Human Element
- o Previous Machining Operations
- o Developing tooling Alternatives

VIII. Tool Drawings

- o Tool Drawings vs Production Drawings
- o Simplified Drawings
- o Dimensioning Tool Drawings
- o Geometric Dimensioning and Tolerancing Tool Drawings

IX. Design and Constructing Jigs and Fixtures

- o Template Jigs
- o Vice-Held and Plate Fixtures
- o Plate Jigs
- o Angle-Plate Jigs and Fixtures
- o Channel and Box Jigs
- o Vice-Jaw Jigs and Fixtures

X. Specialized Workholding Topics

- o Power Workholding
- o Modular Workholding

- o Welding and Inspection tooling
- o Low-Cost Jigs and Fixtures
- o Tooling For CNC Machines
- o Setup Reduction for Workholding
- o Tool Materials