

Washtenaw Community College Comprehensive Report

MEC 201 Mechanisms and Introduction to Mechatronics Effective Term: Fall 2023

Course Cover

College: Advanced Technologies and Public Service Careers
Division: Advanced Technologies and Public Service Careers
Department: Advanced Manufacturing
Discipline: Mechatronics
Course Number: 201
Org Number: 14400
Full Course Title: Mechanisms and Introduction to Mechatronics
Transcript Title: Mechanisms & Intro Mechatronic
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: Course Change
Change Information:

Consultation with all departments affected by this course is required.

Course title

Course description

Pre-requisite, co-requisite, or enrollment restrictions

Outcomes/Assessment

Objectives/Evaluation

Rationale: New Perkins funded equipment received and advisory board input have changed the course.

Proposed Start Semester: Winter 2023

Course Description: In this course, students will gain theoretical knowledge and hands-on skills for shaft, belt, gear and chain drives using real-world motor drive components. Students will learn and apply these skills in mechanical drives training systems and interactive online mechanical drives curriculum. They will also build skills in hands-on mechanical drives including mechanical drive systems, power transmission systems, v-belt drives, chain drives, spur gear drives, and multiple shaft drives. Students will be introduced to Lock-out/Tag-out safety procedures and 5S workplace organization. This course is the foundation for mechatronics programs. The title of this course was previously Mechanisms.

Course Credit Hours

Variable hours: No

Credits: 2

Lecture Hours: Instructor: 0 Student: 0

Lab: Instructor: 60 Student: 60

Clinical: Instructor: 0 Student: 0

Total Contact Hours: Instructor: 60 Student: 60

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Level 3

Requisites

General Education

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Use procedures and diagrams to build electro-mechanical systems.

Assessment 1

Assessment Tool: Outcome-related skills checklist

Assessment Date: Fall 2025

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 75% of students will score 70% or higher.

Who will score and analyze the data: Departmental faculty

2. Analyze mechanical advantage and/or ratios of given mechanisms using math concepts learned in this course.

Assessment 1

Assessment Tool: Outcome-related test questions

Assessment Date: Fall 2025

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 75% of students will score 70% or higher.

Who will score and analyze the data: Departmental faculty

Course Objectives

1. Understand and properly apply Lock-out/Tag Out procedures.
2. Understand 5S workplace organization (Sort, Straighten, Shine, Standardize, Sustain).
3. Assemble components into a machine and evaluate its performance.
4. Calculate gear ratios.
5. Calculate ratio and shaft speed for V-belt and grooved pulley drive systems.
6. Identify components of chain drive systems.
7. Calculate input and output speeds of drive systems.
8. Estimate the mechanical advantage provided by a system of pulleys.

New Resources for Course

Course Textbooks/Resources

Textbooks

Manuals

Periodicals

Software

Equipment/Facilities

Level III classroom

Computer workstations/lab

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Allan Coleman</i>	<i>Faculty Preparer</i>	<i>Jan 08, 2023</i>
Department Chair/Area Director: <i>Allan Coleman</i>	<i>Recommend Approval</i>	<i>Jan 08, 2023</i>
Dean: <i>Jimmie Baber</i>	<i>Recommend Approval</i>	<i>Jan 09, 2023</i>
Curriculum Committee Chair: <i>Randy Van Wagnen</i>	<i>Recommend Approval</i>	<i>Feb 24, 2023</i>
Assessment Committee Chair: <i>Shawn Deron</i>	<i>Recommend Approval</i>	<i>Feb 24, 2023</i>
Vice President for Instruction: <i>Victor Vega</i>	<i>Approve</i>	<i>Feb 27, 2023</i>

Washtenaw Community College Comprehensive Report

MEC 201 Mechanisms Effective Term: Winter 2022

Course Cover

College: Advanced Technologies and Public Service Careers

Division: Advanced Technologies and Public Service Careers

Department: Advanced Manufacturing

Discipline: Mechatronics

Course Number: 201

Org Number: 14400

Full Course Title: Mechanisms

Transcript Title: Mechanisms

Is Consultation with other department(s) required: No

Publish in the Following: College Catalog , Time Schedule , Web Page

Reason for Submission: Three Year Review / Assessment Report

Change Information:

Course description

Pre-requisite, co-requisite, or enrollment restrictions

Outcomes/Assessment

Objectives/Evaluation

Rationale: Three year update based on assessment report results and new faculty mentoring the course. Removed prerequisite for MEC101. Blueprint reading skills are not being included in current course and allows this foundation course to be taken earlier in the student's program. Revised objectives to match available equipment.

Proposed Start Semester: Fall 2021

Course Description: In this course, students will use a blend of hands-on experiences and short research assignments to gain an understanding of electro-mechanical theory and principles. These principles are used for the design and maintenance of industrial machines and products. Students will also examine fundamental forces and motion within mechanisms using a variety of math concepts. This course is the foundation for the mechatronics program.

Course Credit Hours

Variable hours: No

Credits: 2

Lecture Hours: Instructor: 0 Student: 0

Lab: Instructor: 60 Student: 60

Clinical: Instructor: 0 Student: 0

Total Contact Hours: Instructor: 60 Student: 60

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Level 3

Requisites

General Education

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Design and construct machine systems utilizing the six classic machines.

Assessment 1

Assessment Tool: Outcome-related written test questions

Assessment Date: Fall 2022

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 75% of students will achieve 70% or higher

Who will score and analyze the data: Departmental faculty

Assessment 2

Assessment Tool: Lab project

Assessment Date: Fall 2022

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 75% of students will score 70% or higher

Who will score and analyze the data: Departmental faculty

2. Analyze mechanical advantage and/or ratios of given mechanisms using math concepts learned in this course.

Assessment 1

Assessment Tool: Outcome-related written test questions

Assessment Date: Fall 2022

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Departmentally-developed rubric.

Standard of success to be used for this assessment: 75% of students will achieve 70% or higher.

Who will score and analyze the data: Departmental faculty

3. Design a suitable product for a specific force/motion application.

Assessment 1

Assessment Tool: Capstone project

Assessment Date: Fall 2022

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 75% of students will achieve 70% or higher

Who will score and analyze the data: Departmental faculty

Course Objectives

1. Construct models of simple machines.
2. Measure performance of simple machines.
3. Calculate gear ratio for multiple gear drive train.
4. Predict speed ratio for V-belt and grooved pulley drive system.
5. Identify components of chain drive systems.
6. Design a mechanism to produce a specified motion.
7. Identify the component simple machines that are in a complex product.
8. Estimate the mechanical advantage provided by a system of pulleys.
9. Design a mechanism to perform an inspection task.
10. Assemble components into a machine and evaluate its performance.
11. Calculate input and output speeds of drive systems.

New Resources for Course**Course Textbooks/Resources**

Textbooks
 Manuals
 Periodicals
 Software

Equipment/Facilities

Level III classroom

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Allan Coleman</i>	<i>Faculty Preparer</i>	<i>Aug 17, 2021</i>
Department Chair/Area Director: <i>Allan Coleman</i>	<i>Recommend Approval</i>	<i>Aug 17, 2021</i>
Dean: <i>Jimmie Baber</i>	<i>Recommend Approval</i>	<i>Aug 22, 2021</i>
Curriculum Committee Chair: <i>Randy Van Wagnen</i>	<i>Recommend Approval</i>	<i>Nov 05, 2021</i>
Assessment Committee Chair: <i>Shawn Deron</i>	<i>Recommend Approval</i>	<i>Nov 10, 2021</i>
Vice President for Instruction: <i>Kimberly Hurns</i>	<i>Approve</i>	<i>Nov 12, 2021</i>