

MEC 201: MECHANISMS AND INTRODUCTION TO MECHATRONICS

Completed Workflow

1. C&A Office (sabird@wccnet.edu; aabooker@wccnet.edu; cacevans@wccnet.edu; kgwu@wccnet.edu; bjlinford@wccnet.edu)
2. Vice President for Instruction (hbhirth@wccnet.edu; brtucker@wccnet.edu)
3. Banner (cacevans@wccnet.edu)

Approval Path

1. 2025-10-31T17:42:00Z
Sera Bird (sabird): Approved for C&A Office
2. 2025-11-10T03:33:18Z
Brandon Tucker (brtucker): Approved for Vice President for Instruction
3. 2025-12-04T08:03:45Z
Approved for Banner

History

1. Dec 4, 2025 by Sera Bird (sabird)

Viewing: MEC 201 : Mechanisms and Introduction to Mechatronics

Changes proposed by: Sera Bird (sabird)

Effective Term

Winter 2026

Rationale and proposal summary

Continuing to make this a hands-on, technician-based skills course. Aligning with course material being presented.

Course Cover

Full Course Title

Mechanisms and Introduction to Mechatronics

Transcript Title

Mechanisms & Intro Mechatronic

Subject Code

MEC - Mechatronics

Course Number

201

Department

Advanced Manufacturing (AMTD)

Banner Division

ATP

Division/College

Adv Tech/Public Serv Careers (AT)

Org Code

14400

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 (Set in order, Shine, Standardize, Sustain, Safety). This course is the foundation for mechatronics programs. Beginning with the second session, students will complete online preparatory and research modules prior to class to prepare for the daily hands-on lab sessions. The title of this course was previously Mechanisms.

Planned Delivery Format

Face to Face
Online

Has this course been approved for online or online blended?

Yes

Grading method

Standard Letter, Audit

CIP Code

159999 - Engineering/Engineering-Related Technologies/Technicians, Other.

Occupational Indicator

Yes

ACS Code

130

Credit hours, contact hours, repeatability

Repeatable for additional credit

No

Course credits

2

Lab contact hours

60

Total Contact Hours

60

Expected Total Contact Hours

60

Prerequisites and prerequisite skill levels

College-Level Math

Level 3

College-Level Reading and Writing

College-level Reading and Writing

Approved Level I Prerequisite:

Academic Reading and Writing Levels of 6; Academic Math Level 3 or MTH 157 minimum grade "C", may enroll concurrently

Is concurrent enrollment an option for this prerequisite?

Yes

Which courses?

MTH 157

Course Assessment Plan

Learning Outcome

Outcome

Build electro-mechanical systems according to specified procedures and diagrams.

Assessment #1

Assessment Tool

Outcome-related skills project

Anticipated Next Assessment Year

2025

Anticipated Next Assessment Term

Fall

Assessment Cycle

Every Three Years

Anticipated assessment population

All students from all sections

How the assessment will be scored

Departmentally-developed skills checklist

Who does the scoring?

Departmental faculty

Standard of success

75% of students will score 70% or higher.

Assessment #2

Learning Outcome**Outcome**

Demonstrate consistent proper lock out/tag out procedure.

Assessment #1**Assessment Tool**

Outcome-related project

Anticipated Next Assessment Year

2025

Anticipated Next Assessment Term

Fall

Assessment Cycle

Every Three Years

Anticipated assessment population

All students from all sections

How the assessment will be scored

Departmentally-developed skills checklist

Who does the scoring?

Departmental faculty

Standard of success

75% of students will score 70% or higher.

Assessment #2

Learning Outcome

Outcome

Recognize appropriate workplace organization skills based on the 5S method.

Assessment #1

Assessment Tool

Outcome-related exam questions

Anticipated Next Assessment Year

2025

Anticipated Next Assessment Term

Fall

Assessment Cycle

Every Three Years

Anticipated assessment population

All students from all sections

How the assessment will be scored

Answer key

Who does the scoring?

Departmental faculty

Standard of success

75% of students will score 70% or higher.

Assessment #2

Course Objectives

Objective(s)	
1.	Assemble components into a machine and evaluate its performance.
2.	Calculate gear ratios.
3.	Calculate ratio and shaft speed for V-belt and grooved pulley drive systems.
4.	Assemble components of chain drive systems.
5.	Calculate input and output speeds of drive systems.
6.	Demonstrate safe use of hand tools such as screwdrivers, wrenches, adjustable pliers, and others.
7.	Demonstrate the 5S visual workplace organization skills for equipment storage.
8.	Identify a variety of couplings.
9.	Demonstrate assembly and alignment of shaft drive systems.
10.	Assemble gear drive systems.
11.	Assemble and identify components of a V-belt drive system.
12.	Demonstrate mounting and leveling a drive system and correcting soft-foot conditions.
13.	Explain how to properly use a lock out/tag out system.
14.	Demonstrate safe and proper use of hand tools.

General Education Area(s)

Area 1: Writing

No

Area 2: 2nd Writing or Communication/Speech

No

Area 3: Mathematics

No

Area 4: Natural Science

No

Area 5: Social and Behavioral Science

No

Area 6: Arts and Humanities

No

MTA General Education

No

Review

Is conditional approval requested?

No

Is this course currently conditionally approved, and you are now submitting it for full approval?

No

Key: 7321

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>