WASHTENAW COMMUNITY COLLEGE
COURSE-SYLLABUS APPROVAL FORM (CSAF)

For help screens, select a field and press F1

SECTION I. COURSE SUBMISSION INFORMATION

1. **Course:** (Enter proposed discipline, number & title here. If changing the number or title of an existing course, give old number or title in box 4 below.)

Discipline/No: ROB 121 **Title:** Robotics I

Division Code: TEC Department Code: INDT Effective Term: W01

☐ Do not publish in Time Schedule
☐ Do not publish in College Catalog

2. **Type of Approval:** (applies to both new courses and changes)
- ☒ Full Approval
- ☐ Conditional Approval

- ☒ This proposal previously received conditional approval for the Term: F00

3. **Reason for Submission:** This Course is being submitted for: (check all that apply)
- ☐ New Course Approval (Skip the rest of Section I and go directly to Section II.)
- ☐ Five-year Syllabus Review ☐ No changes to course
- ☒ Major Change(s)
- ☐ Minor Change(s) (If not due for review, submit sections I, II, and revised parts of Section III.)
- ☐ Reactivation of Inactive Course
- ☐ Inactivation (Submit Sections I and II only.)

4. **Change Information:** (Check all that apply. Make proposed changes in Section III, Course Syllabus.)

Minor Changes
- ☐ Course Discipline/Number (was _____)
- ☐ Course Title (was _____)
- ☒ Course Description
- ☒ Capacity (was: 20)
- ☐ Pre or Corequisites
- ☒ Course Objectives
- ☒ Distribution of Contact Hours (contact hours were: lect: 45 lab 15 clin _____ exp _____)
- ☐ Distance Learning - minor (Attach Preliminary Approval Form for Distance Learning & the Section Handout.)
- ☐ Other _____

Major Changes (Major changes will be reviewed by Curriculum Committee.)
- ☒ Credit hours (credits were: 3)
- ☐ Core Elements: (Elements to be added: _____) (Elements to be removed: _____)
- ☐ Grading
- ☐ Course Objectives affecting core elements
- ☒ Total Contact Hours (total contact hours were: 60)
- ☐ Honors (Attach Honors Section Approval Form.)
- ☐ Distance Learning - major (Attach Preliminary Approval Form for Distance Learning & the Student Handout for the Distance Section.)
- ☐ Other _____

5. **Rationale for changes:**
To help streamline the Robotics program. Help absorb the content from ROB 111 which is no longer offered. Increase hands on.

SECTION II. COURSE REVIEW INFORMATION AND SIGNATURES

1. **Department Review** (To be completed by department chair; if recommendation is no, initial and return to preparer with rationale attached.)

Will significant new resources be required? ☐ yes ☒ no (If yes, explain _____)
Have departments that may be affected by this course been consulted? ☒ yes ☐ no (Explain _____)
Does the department support approval of this course? ☒ yes ☐ no

Print: Gary Schultz (Faculty/Preparer) Signature: Gary L Schultz Date: 11/14/00

Print: Gary Schultz (Department Chair) Signature: Gary L Schultz Date: 11/14/00

2. **Division Review** (To be completed by division dean; if recommendation is no, initial and return with rationale attached.)

Will significant new resources be required? ☐ yes ☒ no (If yes, have they been secured? ☐ yes ☐ no)
Is this a curricular priority for your division? ☒ yes ☐ no (Comment _____)
What is your estimate of projected enrollment? 36

Recommendation ☒ Yes ☐ No — Division Dean's Signature: Roger R. Burbey — Date: 11/14/00

3. **Curriculum Committee Review** (Attach additional comments if necessary.)

Recommendation ☒ Yes ☐ No — Curriculum Committee Chair's Signature: Ruth A. Hatcher — Date: 12.7.00

4. **Vice President for Instruction and Student Services Approval** (Attach additional comments if necessary.)

Approval ☒ Yes ☐ No — Vice President's Signature: _____ — Date: 12/18

Log File 1/3/01 ACS Code 135 Catalog File Date 12-22-00 BV Access Date 1/3/01

Core Elements Approved _____ New Syllabus Date _____

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JAN 04 2001

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SECTION III. COURSE SYLLABUS **For help screens, select a field and press F1.**

A. COURSE DETAILS (discipline # and title will automatically be entered in 1 and 2 below upon saving or previewing)

1. **Course Discipline & No.:** ROB 121 **2. Course Title:** Robotics I

3. **Course Description:** This is a beginning level course exposing students to various aspects of industrial robots and automated manufacturing. This includes an introduction to hands-on programming. Emphasis is placed on application of flexible automation, types of programming, sensors, and types of robots. Field trips to local manufacuring firms using robotic equipment help the student understand and witness concepts presented in class.
This is the first course in a four course series.

4. **Credit Hours:** 4
If Variable credit, Give Range: _____ to _____
If repeatable for credit, how many times? _____

5. **Class Capacity:** 18
(If nonstandard, attach Class Capacity Exception form.)

6. **Course Options:**
- ☐ Distance learning (Attach preliminary distance approval form and Section Handout.)
- ☐ Honors (Complete Part G.)
- ☐ P/NP Grading (Attach rationale.)

7. **Contact Hours per Semester in:**
Lecture: 45
Lab: 45
Clinical: _____
Experiential: _____
Total Contact Hrs: 90

8. **Prerequisite(s):**
none

9. **Corequisite(s):** (limit to 2)
none

10. **a. Course Purpose:**
- ☒ Program Specialty
- ☐ Program Support
- ☐ Nonprogram Specialty
- ☐ Transfer
- ☐ Enrichment
- ☒ Basic Skills

b. Is this course a requirement for a program?
- ☒ Yes (specify the program(s) below)
  Robotics CTROBC
  Robotics APROB
- ☐ No

c. Indicate schools to which you want Curriculum Services to send syllabus:
(If transfer is approved, attach documentation.)
- ☐ EMU
- ☐ UM
- ☐ Other _____

B. MAJOR INSTRUCTIONAL UNITS A major instructional unit is a grouping of topics that naturally relate to one another. List in order the major instructional units. Add additional numbers as needed.

1. Manufacturing history
2. Industrial applications
3. Robot system fundamentals
4. Robot programming
5. Research Project
6. End of arm tooling
7. Sensors
8. Intro to relay logic and PLC's

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D. INSTRUCTIONAL OBJECTIVES AND CORE ELEMENTS SUPPORTED

DIRECTIONS: (These Units should match those listed in Section B.)Use student outcome based language. (Example: The student will develop and support a thesis in an essay.) If the objective is being used to directly support a core element, write the core element number in the box to the right. If needed, additional information on how the core element is to be met and/or assessed for accomplishment can be included under the objective. If desired you may add a section of "overall course objectives" which are not associated with a specific unit. This may be particularly helpful for addressing core elements.

Unit Objectives		Core Elements
Unit #1	**(SEE ATTACHED SHEET)**	
# 1		
# 2		
# 3		
Unit #2		
# 1		
# 2		
# 3		
Unit #3		
# 1		
# 2		
# 3		
Unit #4		
# 1		
# 2		
# 3		
# 4		
# 5		

ROB-121 ROBOTICS 1

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Objectives

Upon completion of this course, students should be able to do the following:

- Explain the definition of a robot
- Name at least three important inventions that led to the development of the robot, and include the year of the invention.
- Describe the difference between hard automation and flexible automation.
- Describe why the popularity of the robot was delayed until 20 years after its first installation.
- Describe the difference between "accuracy" and "repeatability".
- Define the term "Resolution" as it relates to robot tool positioning.
- Name five applications for industrial robots.
- Identify rectangular, cylindrical, spherical, articulated, and SCARA robots.
- Describe how the "Right Hand Rule" relates to cartesian coordinates.
- Describe the difference between Joint and Linear interpolated motion .
- Describe the difference between open loop and closed loop control systems.
- Describe the difference between absolute and incremental feedback.
- Write fundamental programs using the V+ and VALII languages.
- Power up, calibrate, and execute fundamental programs on two different industrial robots.
- Describe the use of tooling offsets and how they relate to the tool center point.
- Describe three different types of sensors used for discrete inputs.
- Be able to perform basic research using the Internet and campus library.
- Read simple relay logic electrical diagrams.

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E. INSTRUCTIONAL METHODS AND EVALUATION

1. Instructional Methods: (Check the appropriate boxes and describe as needed.)

- ☒ Lecture/Discussion
- ☒ Field Trips
- ☐ Clinical Instruction
- ☒ Team Assignments
- ☐ Self-Paced Learning
- ☐ Telecourse
- ☐ Internet Instruction
- ☐ Video Seminar
- ☒ Computer Simulations
- ☒ Laboratory Assignments
- ☐ On-Site Work Experience
- ☐ Interactive TV
- ☐ Other

2. Evaluation Criteria:

- ☒ Attendance — 10% of final grade is based on attendance, class participation.
- ☒ Quizzes — 80% of final grade = quizzes + mid + final
- ☒ Class Discussion
- ☐ Tests
- ☒ Papers — 10% of final grade = research paper
- ☒ Midterm
- ☐ Portfolio
- ☒ Final Exam
- ☐ Projects
- ☐ Home Work
- ☐ Reports
- ☐ Presentations
- ☐ Clinical/Work
- ☒ Performances — Lab Assignments
- ☐ Other

3. Attendance Requirements: (For Certification or nonevaluative purposes.)

F. EQUIPMENT, FACILITIES, TEXTS, MATERIALS, AND SUPPLIES

1. Special Equipment/Facilities : (Check the appropriate boxes and describe as needed.)

- ☒ Lab equipment — Robots in TI-105
- ☐ Testing Center
- ☐ LRC Reserves
- ☐ Student Competitions
- ☒ Computers — IGRIP software in TI-139
- ☐ Off-Campus Sites
- ☐ CD ROM
- ☐ Student Tutors
- ☒ Field Trips — To local manufacturing sites.
- ☐ Distance Learning Classroom
- ☐ Other

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2. Texts: (Please indicate if no text is required.)

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Title: Robotics Technology
Author: Masterson/Towers/Fardo — Copyright Yr: 1996
Publisher: Goodheart-Willcox — Est. Cost: $30.00

Title:
Author: — Copyright Yr:
Publisher: — Est. Cost:

Title:
Author: — Copyright Yr:
Publisher: — Est. Cost:

Title:
Author: — Copyright Yr:
Publisher: — Est. Cost:

Title:
Author: — Copyright Yr:
Publisher: — Est. Cost:

Other Texts:

3. Supplies and/or Uniforms Student will have to Own or Acquire for Course:
(e.g. calculators, uniforms, tools, and software, etc., excluding pen, pencil, paper, or textbooks.)

Descriptions	Cost Estimates
2) 3.5" floppy discs	$3.00

4. Reference Materials Students Will Use:
(e.g. journals, books, manuals, maps, LRC reserves, etc.)

5. Audio/Visual and Computer Materials Students Will Use:
(e.g. films, video tapes, slides, audio tapes, software, CDs, etc.)

Title	Source
IGRIP Robotic Simulation software	TI-139