

**WASHTENAW COMMUNITY COLLEGE
COURSE-SYLLABUS APPROVAL FORM (CSAF)**

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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: <u>ROB 223</u> Title: <u>Robotics III</u> <u>Winter 2000</u>					
Division Code: <u>TEC</u> Department Code: <u>INDT</u> Effective Term: <u>200109</u>		☐ Do not publish in Time Schedule ☐ Do not publish in College Catalog			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: <u>200109</u>		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 <u>not</u> 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.) <table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> Minor Changes ☐ Course Discipline/Number (was _____) ☐ Course Title (was _____) ☒ Course Description ☐ Capacity (was: _____) ☒ Pre or Corequisites ☒ Course Objectives ☒ Distribution of Contact Hours (contact hours were: lect: <u>30</u> lab <u>60</u> clin _____ exp _____) ☐ Distance Learning - minor (Attach Preliminary Approval Form for Distance Learning & the Section Handout.) ☐ Other _____ </td> <td style="width:50%; vertical-align: top;"> Major Changes (Major changes will be reviewed by Curriculum Committee.) ☒ Credit hours (credits were: <u>4</u>) ☐ Core Elements: (Elements to be added: _____ (Elements to be removed: _____) ☐ Grading ☐ Course Objectives affecting core elements ☒ Total Contact Hours (total contact hours were: <u>90</u>) ☐ Honors (Attach Honors Section Approval Form.) ☐ Distance Learning - major (Attach Preliminary Approval Form for Distance Learning & the Student Handout for the Distance Section.) ☐ Other _____ </td> </tr> </table>				Minor Changes ☐ Course Discipline/Number (was _____) ☐ Course Title (was _____) ☒ Course Description ☐ Capacity (was: _____) ☒ Pre or Corequisites ☒ Course Objectives ☒ Distribution of Contact Hours (contact hours were: lect: <u>30</u> lab <u>60</u> 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: <u>4</u>) ☐ Core Elements: (Elements to be added: _____ (Elements to be removed: _____) ☐ Grading ☐ Course Objectives affecting core elements ☒ Total Contact Hours (total contact hours were: <u>90</u>) ☐ Honors (Attach Honors Section Approval Form.) ☐ Distance Learning - major (Attach Preliminary Approval Form for Distance Learning & the Student Handout for the Distance Section.) ☐ Other _____
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5. Rationale for changes:

Streamlining the course and adding a separate course in Robotic Simulation.

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 <u>none affected</u>) Does the department support approval of this course? ☒ yes ☐ no Print: <u>Gary Schultz</u> Faculty/Preparer Signature: <u>[Signature]</u> Date: <u>4/26/01</u> Print: <u>Gary Schultz</u> Department Chair Signature: <u>[Signature]</u> Date: <u>4/26/01</u>			
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? <u>36</u> Recommendation ☒ Yes ☐ No <u>[Signature]</u> Division Dean's Signature Date: <u>4/26/01</u>			
3. Curriculum Committee Review (Attach additional comments if necessary.) Recommendation ☒ Yes ☐ No <u>[Signature]</u> Curriculum Committee Chair's Signature Date: <u>6.12.01</u>			
4. Vice President for Instruction and Student Services Approval (Attach additional comments if necessary.) Approval ☒ Yes ☐ No <u>[Signature]</u> Vice President's Signature Date: <u>7/5</u>			
Log File <u>7/10/01</u> ACS Code <u>1.32</u> Catalog File Date <u>7/10/01</u> Access Date <u>7/10/01</u> Core Elements Approved _____ New Syllabus Date <u>200105</u>			

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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.: <u>ROB 223</u>		2. Course Title: <u>Robotics III</u>	
3. Course Description: Students learn to work with peripheral devices in various robotic workcells. Labs include part recognition, sorting, counting, measuring, and palletizing. Programmable controllers are used to interface robots with other automated equipment. Students are introduced to automated conveyors, vision systems, bar coding, and automated welding. It is recommended that students: <u>complete</u> ELE-224 (Programmable Controllers) before taking this course. This course should be taken the same semester as ROB-222 Robotic Simulation.			
4. Credit Hours: <u>2</u> If Variable credit, Give Range: _____ to _____ If repeatable for credit, how many times? _____		5. Class Capacity: <u>18</u> (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: <u>15</u> Lab: <u>30</u> Clinical: _____ Experiential: _____ Total Contact Hrs: <u>45</u>		8. Prerequisite(s): <u>ROB 212</u> _____ _____	
9. Corequisite(s): (limit to 2) <u>ROB 222</u> _____			
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) _____ ☐ 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. Advanced VAL II and V+ programming
2. Binary Vision Systems
3. Various types of robot I/O control
4. Programmable Controller Interfacing
5. Automated conveyor operation
6. Introduction to Bar coding
7. Introduction to automated welding

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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 Advanced VAL II and V+ programming**

1 Students will effectively program and use an emergency safety gate and "no parts" routine.

2 Students will use the robot to measure and sort parts.

3 Students will use while...do, prompt, reacti, and if...then...else programming constructs.

Unit #2 Binary Vision System

1 Students will check for presence of attributes in parts using pixel count.

2 Students will measure parts using edge detection.

3 Students will learn to choose the correct lighting in order to optimize vision performance.

Unit #3 Various types of I/O control

1 Students will learn the different types of Input and Output control used on our robots.

2 Students will learn to choose appropriate sensors for each robot.

3 Students will learn the difference between PNP and NPN logic.

Unit #4 Programmable Logic Controller interfacing

1 Students will perform simple "hand shaking" between a PLC and a robot.

2 Students will use timers and counters when interfacing.

3 Students will perform various levels of signal conversion between unlike voltages.
(ie. 24 VDC to 120 VAC.)

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Unit #5 Automated conveyor operation

- # 1 Students will be able to describe the operation of the Bosch automated conveyor.
- # 2 Students will write a simple PLC program to sequence the pallets and stops.
- # 3 Students will interface a robot with the conveyor using a PLC.

Unit #6 Introduction to bar coding

- # 1 Students will describe operation of simple UPC codes for bar coding.
- # 2 Students will interface a robot, conveyor, and bar code reader for tracking parts.

Unit #7 Introduction to automated welding

- # 1 Students will write basic programs for robotic welding.
- # 2 Students will use correct terminology as related to robotic MIG welding.
- # 3 Students will adjust welding parameters to correct basic welding problems.

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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 _____ | ☒ Quizzes _____ |
| ☐ Class Discussion _____ | ☐ Tests _____ |
| ☐ Papers _____ | ☒ Midterm _____ |
| ☐ Portfolio _____ | ☒ Final Exam _____ |
| ☒ Projects _____ | ☐ Home Work _____ |
| ☐ Reports _____ | ☐ Presentations _____ |
| ☐ Clinical/Work _____ | ☐ Performances _____ |
| ☐ 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 <u>Robots in TI shop</u> | ☐ Testing Center _____ |
| ☐ LRC Reserves _____ | ☐ Student Competitions _____ |
| ☐ Computers _____ | ☐ Off-Campus Sites _____ |
| ☐ CD ROM _____ | ☐ Student Tutors _____ |
| ☐ Field Trips _____ | ☐ Distance Learning Classroom _____ |
| ☐ Other _____ | |

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

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Title: No Text Required

Author: _____ Copyright Yr: _____
 Publisher: _____ Est. Cost: _____

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 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

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
