April 23, 2026

**TO:** Ken Barish, Chair
Riverside Division of the Academic Senate

**FROM:** Evangelos (Vagelis) Christidis, Chair
BCOE Executive Committee

**RE:** BS+MS in Robotics

The BCOE Executive Committee met on April 23rd, 2026. Regarding the BS+MS in Robotics, the committee supports it unanimously.

Proposal for a

# Combined B.S./M.S. Five-Year Degree Program in Robotics

January 18, 2026

Proposed by the Faculty of the Robotics Program
University of California, Riverside
Riverside, CA 92521

# 1. Introduction

The Robotics Program Faculty in the Marlan and Rosemary Bourns College of Engineering proposes a Combined B.S./M.S. Degree Program in Robotics to be offered jointly by the Departments of Electrical and Computer Engineering, Computer Science and Engineering, and Mechanical Engineering. This initiative responds to the accelerating demand for robotics engineers and the rapidly evolving landscape of robotics, where the convergence of mechanics, perception, and artificial intelligence necessitates a deeper, more advanced, and integrated level of study. The proposed five-year plan of study provides a streamlined path for qualified undergraduates in Robotics Engineering to earn both a B.S. and an M.S. in Robotics, equipping them with the advanced expertise required in the field.

**Motivation:** As noted in the document *Establishment of Combined Programs at UCR,*[1] "Combined programs can better attract top high school graduates, transfer students, and returning students, especially those interested in advanced degrees. Thus, UCR departments can expect a higher proportion of good undergraduates. Combined program students will be more inclined to stay at UCR for their master's studies instead of applying to other institutions. Thus, UCR departments can better retain these students." The University of California has placed an increased emphasis on attracting transfer students from community colleges, and the proposed joint B.S./M.S. program offers a unique and accessible pathway for these students to pursue graduate-level training. We anticipate that this initiative will enhance UCR's ability to recruit and retain top students across both theBS and MS programs.

**Method:** The M.S. in Robotics is a 40-unit program, typically completed in four quarters. The combined B.S./M.S. program allows UCR students to earn both a B.S. in Robotics Engineering and an M.S. in Robotics in five years. To achieve this, the joint program allows for the following benefits compared to matriculating in the M.S. program alone:

[1] https://senate.ucr.edu/about/policies/establishment_of_combined_programs_at_ucr.html
alternate link: https://ucr-senate-public.s3.amazonaws.com/committees/10/committee_resource/establishment-of-combined-programs-at-ucr-60df796d88e04-.pdf

- Allowing students to take graduate-level courses that will count toward their technical elective requirements.
- Allowing up to twelve (12) units (three 4-unit courses) of graduate coursework taken as an undergraduate to apply toward the M.S. degree, fulfilling focus area requirements and/or elective requirements in case the student selects the comprehensive exam option. The coursework must be pre-approved and can be counted toward satisfying the B.S. in Robotics Engineering technical elective requirements.

**Relation to Existing Programs:** The combined B.S./M.S. program involves no new courses or requirements. The existing Robotics MS program has been updated to meet its own requirements, and all those changes are compatible with the proposed joint B.S./M.S degree. The list of graduate courses is also expected to expand in the future, to reflect recent faculty hiring and growth across the participating departments.

**Contributions to Diversity:** Since the new program will allow well-prepared students to obtain a master's degree within one year after they obtain a B.S. degree, it can help reduce their financial burden and therefore attract more students who are usually coming from low-income families. For example, we plan to recruit more students from community colleges who transfer to UCR and then complete the combined B.S./M.S. program, and encourage all deserving students to apply to our combined B.S./M.S. program. Student clubs from the pathway major, such as the Institute of Electrical and Electronic Engineers (IEEE), Association for Computing Machinery (ACM), the Society for Women Engineers (SWE), Women in Computer Science, Highlander Statistics Society, the Data Science Society, Statistics GSA, and Mu Sigma Rho, will also help us recruit and retain all deserving students by investing in each student's success, sense of belonging, and cultural competency. The above diversity goals for students can be measured by the broader demographics of eligibility pools, applicants, and enrollments, improved graduation rates and time to graduation for student groups, and 2nd-year retention rates.

**Interrelation with Other UC Institutions:** The proposed program is distinguished nationally by its deeply integrative curriculum. This distinction stems from its collaborative design, development, and execution by a cohesive team of research-active faculty whose complementary expertise spans the key converging sub-disciplines of contemporary robotics. Strategically, this program will enhance the appeal of the B.S. and M.S. degrees in Robotics while avoiding competition or overlap with existing UCR programs. This unique positioning provides the UCR campus with a significant competitive advantage over peer institutions, both within the University of California system and nationwide. Moreover, the program is expected to function as a vital pipeline, attracting high-caliber students who will be strong candidates for transitioning into Ph.D. programs in computing and engineering at UCR and across other UC campuses.

**Department that Will Administer the Program:** The program will continue to be administered jointly by the Departments of Electrical and Computer Engineering, Computer Science and Engineering, and Mechanical Engineering, as the individual B.S. in Robotics Engineering and M.S. in Robotics programs.

**Timetable for Development:** The new program will start for the Fall 2026 entry term. Existing students in the B.S. in Robotics Engineering major will be allowed to apply for the combined B.S./M.S., provided that they have taken at least four (4) units that can be used for the completion of their M.S. degree by their senior year.

**Job Demand in the Field:** There has been a strong and consistent demand for robotics engineers across industry, government, institutional services, and research sectors. Job prospects in the robotics sector are robust, driven by rapid advancements in automation and artificial intelligence across numerous industries. According to Zion Market Research, the global robotics market is projected to expand from approximately $38 billion in 2023 to over $100 billion by 2032. This significant growth fuels a strong demand for skilled professionals who can design, build, and maintain robotic systems. The World Economic Forum's "Future of Jobs Report 2025" highlights that while automation will displace some roles, it is simultaneously expected to create 97 million new jobs, many of which will be in robotics and artificial intelligence. High-demand positions include robotics engineers, automation specialists, and software developers, particularly in burgeoning sectors like logistics, healthcare, manufacturing, and agriculture, signaling a dynamic and expanding career field. As a result, the job prospects for M.S. graduates in Robotics are exceptionally favorable.

**Plan for Evaluation of the Program.** The effectiveness of the program will be evaluated by monitoring the extent to which it increases the number of well-qualified students in the respective B.S. and M.S. programs. The metrics of evaluation will include GPA, graduation rates, job placement, and acceptance to advanced degree programs.

# 2. Program

**Admission Criteria:** The proposed 5-year combined B.S./M.S. in Robotics program will have two time frames for admission, one of which is for conditional admission: 1) preliminary conditional admission as an incoming lower division student, and 2) admission as a senior meeting admission criteria. We propose to offer outstanding freshmen in the B.S. in Robotics Engineering major the opportunity to apply for preliminary (conditional) admission into the combined B.S./M.S. in Robotics program based on their undergraduate admission qualifications. This can serve as a recruiting tool as well as increase participation in the Robotics major. Official admittance (application via the graduate division) would still require meeting the course and GPA criteria and satisfactory progress in the undergraduate major.

*Preliminary Conditional Admission Criteria (HS)*

- High School GPA >3.6
- Satisfy Entry-Level Writing requirement prior to matriculation
- Sufficient math preparation to enroll in calculus upon arrival
- Seeks Preliminary Conditional Admission Criteria (BS) as a senior undergraduate

*Preliminary Conditional Admission Criteria (BS – apply at the beginning of the senior year)*

- Pursuing a major in Robotics Engineering
- Overall GPA of 3.4 or higher
- A preliminary "core" course GPA of 3.3 in at least three of the following five "core" requirements with no grade less than a B-: (1) CS 100, (2) EE 106, (3) EE 144 / ME 144, (4) MATH 031, (5) ME 120
- One letter of recommendation from a UCR faculty member affiliated with the robotics program

*Matriculation into the combined program occurs in the Fall term following senior year, provided:*

- Enrolled in the UCR Robotics Engineering Major
- Overall GPA 3.4 or higher
- A final "core" course GPA of 3.3 in at least four of the following five "core" requirements with no grade less than a B-: (1) CS 100, (2) EE 106, (3) EE 144 / ME 144, (4) MATH 031, (5) ME 120

To complete the BS+MS in five years, it is strongly recommended that students complete at least two graduate courses by the end of the senior year from an M.S. focus area list and/or the M.S. elective list in case the student plans to pursue the M.S. comprehensive exam option. These courses will be counted towards the B.S. technical electives and the M.S. degree requirements.

**Combined B.S./M.S. Degree Requirements**. The M.S. in Robotics program's course requirements remain as outlined in the general catalog. The only concurrent changes involve updates to the list of approved focus area electives and increased flexibility in the required core courses to better accommodate students in the MS program and the proposed B.S./M.S. program.

The Robotics Engineering major remains as currently outlined in the general catalog, with the addition of a mention of this pathway and a pointer to this new proposal's language, as well as revisions to the major requirements to replace some of the required courses in lieu of new course additions and to update the list of technical electives.

During the MS portion of the program, students must maintain a GPA of at least 3.0 for all coursework. If the GPA falls below 3.0, they may be dropped from the program.

**Sample Combined B.S./M.S. Degree Program in Robotics.** The example below shows a sample course plan. It considers the following working conditions:

- The B.S. portion includes the new proposed changes in the B.S. program
- The M.S. portion includes the new proposed changes in the M.S. program
- The student follows the project option for the M.S. degree
- EE 268 and CS 227 / EE258 are used to count both as ENRB technical electives for the B.S. degree and as focus area electives, assuming the student selects "Motion Planning and Autonomous Navigation" as their focus areas for the M.S. degree
- The student chooses CS 258/EE 227 as the third focus area elective course

## Sample Combined B.S./M.S. in Robotics Course Plan

| | **FALL** | **WINTER** | **SPRING** |
|---|---|---|---|
| **1ST YEAR** | WRIT 010 (4)<br>MATH 009A (4)<br>CS 010A (4)<br>ME 009 (4)<br><br>16 UNITS | WRIT 020 (4)<br>MATH 009B (4)<br>CS 010B (4)<br>PHYS 040A (5)<br><br>17 UNITS | CS 010C (4)<br>MATH 009C (4)<br>PHYS 040B (5)<br>WRIT 030 (4)<br><br>17 UNITS |
| **2ND YEAR** | CS 100 (5)<br>MATH 010A (4)<br>PHYS 040A (5)<br>Hum/ Soc Sci Breadth (4)<br><br>18 UNITS | EE 106 (4)<br>MATH 045 (4)<br>MATH 031 (5)<br>Bio Sci Breadth (4)<br><br>17 UNITS | CS 061 (4)<br>MATH 011 (4)<br>EE 005 (4)<br>ME 143 (4)<br><br>12 UNITS |
| **3RD YEAR** | EE 114 (4)<br>ME 120 (4)<br>EE 197 (4)<br>Hum/ Soc Sci Breadth (4)<br><br>16 UNITS | CS/EE 120A (5)<br>EE 111 (4)<br>EE/ME 144 (4)<br>ENRB Technical Elective (4)<br><br>17 UNITS | CS/EE 120B (4)<br>EE 132 (4)<br>ENRB Technical Elective (4)<br>Hum/ Soc Sci Breadth (4)<br><br>16 UNITS |
| **4TH YEAR** | EE/CS 148 (4)<br>EE175A (4)<br>Hum/ Soc Sci Breadth (4)<br>ENRB Technical Elective (4)<br><br>16 UNITS | EE175B (4)<br>***EE 268 - ENRB Technical Elective (4)***<br>Hum/ Soc Sci Breadth (4)<br><br>12 UNITS | EE 142 / CS 171 (4)<br>***CS 258 / EE 227 - ENRB Technical Elective (4)***<br>Hum/ Soc Sci Breadth (4)<br><br>12 UNITS |
| **5TH YEAR (MS)** | CS 224 / EE 242A (4)<br>EE 230 (4)<br>CS 258 / EE 227 (4)<br><br>12 UNITS | CS/EE 265A (4)<br>ME 225 (4)<br>EE 297 (4)<br><br>12 UNITS | EE/CS 265B (4)<br>EE 297 (4)<br><br>8 UNITS |

**Normative time from matriculation to degree.** Five years.

# 3. Catalog Entry

**Combined Five-Year B.S./M.S. Program**

The BCOE College offers a combined five-year B.S./M.S. program in Robotics Engineering that caters to the current UCR B.S. in Robotics Engineering students as well as incoming students who directly enter, transfer to, or change majors to the Robotics Engineering program. It enables students to complete the Robotics M.S. degree program in one year by allowing up to three graduate courses taken as an undergraduate to apply towards the M.S. degree, fulfilling focus area requirements and/or elective requirements in case the student selects the comprehensive exam option. The courses must be pre-approved and can be counted toward satisfying the B.S. in Robotics Engineering technical elective requirements.

A B.S. student may apply at the beginning of their senior year by submitting an application to the M.S. in Robotics program, provided that, at the end of their junior year, the student was a UCR B.S. student in the Robotics Engineering major. Applicants to the B.S. + M.S. programs are expected to have a cumulative GPA of at least 3.4 and completed at least three of the following five "core" course requirements with no grade less than a B- and average grade of at least 3.3: (1) CS 100, (2) EE 106, (3) EE 144 / ME 144, (4) MATH 031, (5) ME 120. The application to the M.S. program must include at least one recommendation letter from a UCR Academic Senate faculty member affiliated with UCR's Robotics program. Matriculation into the combined program occurs in the Fall term following senior year, provided: (a) the M.S. application is accepted, (b) throughout the senior year, the student is in the Robotics Engineering major with cumulative GPA 3.4 or higher, (c) no grade less than a B- and an average grade of at least 3.3 in in at least four of the five "core" courses listed above prior to matriculation into the program, (d) by the end of the senior year, the student completes their corresponding B.S. degree requirements. To complete the B.S.+M.S. in five years, it is strongly recommended that students complete at least two graduate-level courses by the end of their senior year. These courses should come from an M.S. focus area list and/or the M.S. electives list in case the student plans to pursue the comprehensive exam option. The courses will be counted toward both the B.S. technical electives and the M.S. degree requirements.

Incoming students who are applying to the Robotics Engineering B.S. program may simultaneously apply for preliminary conditional admission into the combined B.S./M.S. program, provided their high school GPA is at least 3.6, they satisfy the Entry Level Writing requirement before matriculation, they have sufficient math preparation to enroll in calculus upon arrival, and they aim to meet the preliminary conditional admission criteria. Preliminary conditional admission status will remain in effect as long as the criteria are met. Preliminarily admitted students still need to follow the formal application steps listed earlier in their senior year to confirm and complete admission to the joint B.S./M.S. program.

# 3. Projected Need, resource requirements, student support

This combined program is primarily a recruitment tool, intended to leverage the increasing interest in graduate robotics and AI education and attract top UC Riverside B.S. in Robotics Engineering students into the Robotics M.S. program.

For the Robotics Engineering majors, the prospect of completing both the B.S. in Robotics Engineering and the M.S. in Robotics in a total of five years should attract students who are highly motivated and more likely to make it through the program. Further, we expect that the opportunity of earning a combined B.S./M.S. in three years will be highly attractive to *community college transfer students* as well. Enrollment of community college students has recently become an urgent priority for the University of California. Combined with ongoing increases in admissions standards, this should increase both retention and the overall quality of the students.

For the M.S. program, we anticipate that combined-program enrollment will initially increase by only a few students per year (a dozen or so). There would be no expectation of support for the participants in the combined B.S./M.S. program. In addition, if at some point in the future, funding opportunities emerge from campus, college, department, or Graduate Division sources for M.S. students, then fifth-year B.S./M.S. students would be eligible. One example could be available Reader or Teaching Assistantship positions, especially for courses that include labs. Each student accepted into the combined program is likely to be near the top of the applicant pool. If a student decides to continue on for a Ph.D., then full support packages would be provided.

In short, the main effect of the program should be to increase the quality and diversity of students in the Robotics Engineering B.S. and Robotics M.S. programs, and achieve a modest increase in enrollment levels. Similarly, it should increase the employability of students produced by both programs and help meet the increasing demand for AI and Robotics students with graduate degrees.

**Resources**

Each student in the combined program is essentially just a regular student (in the B.S. program, or, in the fifth year, in the M.S. program), and requires the same resources as a regular student at the same level. Also, because of the highly selective nature of the admissions requirements, B.S. and M.S. enrollments will be modestly affected, at least initially. Therefore, the program requires no change in faculty, courses, or resources such as library, computing, equipment, lab space, etc. Likewise, the program requires no change in levels or mechanisms for student funding.

The program does require minor administrative support. During the B.S. portion of this program, students will be advised by the BCOE Undergraduate Academic Advising Center as normal for

pursuance of a B.S. in the Robotics Engineering major. The administration of the program at the undergraduate level requires processing applications for preliminary acceptance, tracking preliminarily enrolled students, and identifying and informing students who will be eligible to apply at the end of their junior year. The administrative functions for admission to the Robotics Graduate program are already performed by the program's Graduate Admission Committee; this committee will also be responsible for administering this B.S./M.S. program with continued support from BCOE Graduate Student Advising, which will have to track which M.S. students are in the combined program and account for the double-counting allowance.

Finally, only to the extent that existing resources allow, B.S. students with "preliminary conditional admission" status will be given additional advising appropriate for M.S.-bound students.

# 4. Changes in Senate Regulations

No changes in Senate regulations are required.

# 5. Implementation timeframe

We expect the new program to be open for application in May 2026 and start accepting students for the Fall 2026 entry term.

This proposal was approved by the M.S. in Robotics faculty on February 9, 2026.

Submitted by:
Amit Roy-Chowdhury
Chair of the Robotics Program