

# LABORATORY FOR COMPUTATIONAL SENSING AND ROBOTICS (LCSR) MINOR IN ROBOTICS

Name: \_\_\_\_\_ Date: \_\_\_\_\_

JHU email: \_\_\_\_\_ Phone Number: \_\_\_\_\_

Major(s): \_\_\_\_\_ Minor(s): \_\_\_\_\_

Expected Graduation Month/Year: \_\_\_\_\_ Student ID#: \_\_\_\_\_

## **COURSE SELECTION AND MINOR REQUIREMENTS**

For up-to-date information on Minor requirements, see

[https://lcsr.jhu.edu/Robotics\\_Minor](https://lcsr.jhu.edu/Robotics_Minor)

This web page provides a complete and up-to-date list of minor courses, including what requirements they fulfill.

An undergraduate qualifies for the minor provided he or she has taken at least 18 credits (at the 300 level or above, with a C- or above) from an approved list of courses (provided on the Robotics Minor website, URL listed above), subject to the approval of a minor advisor.

### **Robotics Minor Requirements:**

- Between 2 and 4 courses (minimum of 6 credits) must cover the three core skills: Robot kinematics and dynamics (R), Systems theory, signal processing, control (S), Computation and sensing (C).
- At least 2 courses (minimum of 6 credits) must be chosen from advanced supplementary skills
- At least 3 credits of the 18 must be a laboratory course (at least 15 hours of laboratory time that includes working with physical hardware and/or real data);

### **Restrictions / Additional Requirements:**

- At most 3 credits of the 18 can be an independent research or individual study with a faculty member on the list of approved faculty advisors;
- At least 2 courses (minimum of 6 credits) must be primarily listed in a department other than the student's home department (it is acceptable if such a course is cross-listed in the student's home department)
- For graduating classes 2019 and beyond, EN.530.343 and EN. 530.344 Design and Analysis of Dynamical Systems MAY NOT count towards the minor if taken after EN.520.353 Control Systems or EN.520.454 Control Systems Design.

## **HOW TO DECLARE A MINOR IN ROBOTICS**

1. All students interested in the minor are required to make an appointment with Alison Morrow in the LCSR to be assigned to a minor advisor to receive guidance about the program.

Email: [alison.morrow@jhu.edu](mailto:alison.morrow@jhu.edu)

2. Students who decide to pursue the minor should also review their academic transcript with their minor advisor to ensure they will be able to complete the requirements.
3. Fill out and submit an Add Minor form (which can be obtained from the registrar's office)
4. Complete the **Requirements Checkout** tables below. You should meet with your minor advisor periodically (at least once per year), bringing a copy of this form for review.
5. During your senior year, you must also note the Robotics Minor on your *Application for Graduation*.
6. When all requirements have been completed, take the completed form to the Robotics Minor Program Coordinator for review and signature.

## REQUIREMENTS CHECKOUT

| Basic Requirements  | Completed?               |
|---|--------------------------|
| Core and supplementary courses (at least 18 credits total):         | <input type="checkbox"/> |
| 2 to 4 <b>Core</b> Courses collectively covering R, S, C areas      | <input type="checkbox"/> |
| 2 to 4 Advanced <b>Supplementary</b> courses                        | <input type="checkbox"/> |
| At least <b>3 credits</b> of the 18 are a <b>laboratory</b> course? | <input type="checkbox"/> |
| At least <b>2 courses</b> listed outside your primary department?   | <input type="checkbox"/> |
| Limitations   | Satisfied?               |
| Not more than 3 independent study or research credits?              | <input type="checkbox"/> |
| Grade of C- or above in all courses?                                | <input type="checkbox"/> |
| All credits at 300 level or above?                                  | <input type="checkbox"/> |

**Important Notes & Limitations:** If a course number, title, or number of credits is not identical to the course information as listed in this packet, the course WILL NOT be accepted unless the minor advisor reviews and approves the course in advance in writing using the WSE substitution/waiver form.

| Dept. | Num. | Cred. | Course Title | Sem-ester | R                        | S                        | C                        | Sup                      | Lab                      | Outside dept.?           |
|-------|------|-------|--------------|-----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|       |      |       |              |           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|       |      |       |              |           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|       |      |       |              |           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|       |      |       |              |           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|       |      |       |              |           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|       |      |       |              |           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|       |      |       |              |           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

### STUDENT'S STATEMENT

I have reviewed my progress toward meeting the graduation requirements for the Robotics Minor. I understand which requirements have been completed and which remain to be completed, including those in progress.

\_\_\_\_\_  
Student's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Robotics Advisor's Signature

\_\_\_\_\_  
Date

### FINAL APPROVAL (TO BE SIGNED ONLY ON COMPLETION OF ALL REQUIREMENTS)

The Robotics Minor program coordinator has reviewed the student's final transcript and this checkout sheet, and is confident that the minor requirements have been fulfilled.

\_\_\_\_\_  
Robotics Program Coordinator Signature

\_\_\_\_\_  
Date