

# I. Integrated Degree Program (IDP) Requirements

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## 1. Admission Requirements

Highly qualified undergraduate BSE students will be encouraged to apply to the integrated program. The application will be due by the end of Winter Quarter in the students' junior year. The application procedure will be as follows:

- By the end of Fall quarter, students in their junior year with a GPA above 3.5 will be identified by the department and encouraged to apply to the integrated degree program.
- The Graduate adviser will meet with the interested student and identify a major professor, whose expertise is in the same area as that of the student's interest. Applicants are strongly advised to communicate with the major professor prior to the application process.
- By the end of Winter quarter, students should apply to the program by completing the standard MS application form (<http://gradstudies.ucdavis.edu/index.cfm>) and paying appropriate fees.
- Students with a GPA under 3.5 who are applying to the program must take the GRE test by the end of Winter quarter.
- All students applying to the program will be required to submit three letters of recommendation. Upon admission to the program (Spring quarter of the Junior year) the student will work with the major professor to select an appropriate graduate course to be taken during the senior year.
- Students admitted to the IDP will be invited to the new student orientation in the Fall quarter, when the graduate adviser will explain all the degree requirements. The student will work with his/her major professor and constitute a course guidance committee early in her/his senior year to plan their program of study. S/he must submit the program of study to the Biological Systems Engineering Graduate Adviser. Applications will be reviewed by the program Graduate Executive Committee with decision by the end of the Spring quarter of the senior year.

*Note that students admitted under this program are awarded a Bachelor's degree as soon as they complete all the requirements for the BS degree. They will be advanced to graduate status in the quarter immediately following completion of their BS degree.*

**a) Prerequisites:**

The program is available only to UCD students in the Biological Systems Engineering major with strong academic records. Students with a GPA above 3.5 will not be required to take the GRE test at the time of their application. However, these students will be encouraged to take the test by the end of Fall quarter of their senior year as it is required for many fellowship applications. While admission requires an undergraduate GPA of 3.0 or better consistent with University policy, students with a GPA under 3.25 are not likely to be admitted to the integrated degree program.

**b) Deficiencies:**

Under some exceptional circumstances, students with a GPA below 3.0 may be conditionally admitted with a coursework only option for the purposes of demonstrating the ability to maintain a qualifying GPA at the graduate level prior to full admission.

**2. Master's Plan:** There will be two MS degree options - MS Plan I (Thesis option) and MS Plan II (Comprehensive Examination option). Both plans satisfy the graduate degree requirements as stipulated by the Academic Senate.

[http://academicsenate.ucdavis.edu/cerj/manual/dd\\_regs.cfm#500-](http://academicsenate.ucdavis.edu/cerj/manual/dd_regs.cfm#500-)

*Plan I:* This plan requires a minimum of 30 units of graduate and upper division courses (100 and 200 series only) consisting of:

- (i) Research Methods in Biological System Engineering, EBS 200 (2 units)
- (ii) Seminar, EBS 290 (1 unit)
- (iii) Graduate engineering courses (12 units)
- (iv) Additional graduate or upper division courses not required for EBS BS degree (5 units)
- (v) 290C, 299 Research (at least 6 units)
- (vi) Other graduate or upper division courses for a total of at least 30 units.
- (vii) Submission of a thesis approved by three faculty members.

Students under this plan should take 3 units of graduate course during their senior undergraduate year.

*Plan II:* This plan requires a minimum of 36 units of graduate and upper division courses (100 and 200 series only) consisting of:

- (i) Research Methods in Biological System Engineering, EBS 200 (2 units)
- (ii) Seminar, EBS 290 (1 unit)
- (iii) Graduate engineering courses (12 units)

- (iv) Additional 6 units of graduate courses for a total of at least 18 graduate units including the 12 graduate engineering units listed in # (iii) above. The remaining 6 units of courses can be either graduate or upper division courses not required for EBS BS degree
- (v) 290C, 299 Research (up to 9 units)
- (vi) Other graduate or upper division courses for a total of at least 36 units.
- (vii) Oral Comprehensive Examination before a three faculty committee members.

Students under this plan should take 3 units of graduate course during their senior undergraduate year.

### 3. Course Requirements:

#### Requirements within the BS degree

- Students admitted to the program will take an appropriate 3-unit graduate course selected in consultation with their major professor during their senior year, in lieu of the 3-unit upper division engineering elective required for the BS degree in BSE (Figure 1).

#### Requirements for the MS degree

##### MS Plan I (Thesis option) - Core and Electives (30 units)

The degree requirements under this plan are depicted in Figure 1 and summarized below:

##### a) Core courses (3 units)

EBS 200 Research methods in biological systems engineering	(2 units)
EBS 290 Seminar	(1 unit)

##### b) Elective courses (27 units)

These courses should be selected in consultation with guidance committee members and should meet the requirements stated in #2 (Plan I) above.

c) **Summary:** Figure 1 succinctly summarizes our IDP Plan I degree requirements.

##### MS Plan II (Comprehensive Examination option) – Core and Elective (36 units)

The degree requirements under this plan are depicted in Figure 2 and summarized below:

##### a) Core courses (3 units)

EBS 200 Research methods in biological systems engineering	(2 units)
EBS290 seminar course	(1 unit)

##### b) Elective courses (minimum of 33 units)

These courses should be selected in consultation with the course guidance committee members and should meet the requirements stated in #2 (Plan II) above.

c) **Summary:** Figure 1 succinctly summarizes our IDP Plan II degree requirements.

**4. Special Requirements:** None.

**5. Committees:**

a) **Admission Committee:** The graduate admission adviser and staff adviser handle all application-related issues. Once the completed application, all supporting materials, and application fee have been received, the admission adviser will circulate the application packet to three faculty members of the Biological Systems Engineering graduate program whose research interests match those of the applicant. Based on the evaluations of the three faculty members, the graduate admission adviser will make the admission recommendation and forward it to the Dean of the Office of Graduate Studies for final approval of admission

b) **Course Guidance or Advising Committee:** Upon acceptance into the program, students are required to meet with an assigned major professor in their primary technical area of interest to plan their proposed plan of study. Prior to the beginning of Fall quarter of their senior year, students must submit a Program of Study for the completion of their BS and for their MS degrees. Students will meet with their major professor at least once per quarter during their senior year.

c) **Thesis Committee (MS Plan I) /Comprehensive Examination Committee (MS Plan II):** Students who are pursuing MS Plan I are required to set up a Thesis Committee at the time of Advancement to Candidacy. Students Pursuing MS Plan II are required to set up a Comprehensive Examination Committee at the time of Advancement to Candidacy. This committee of three is nominated by the student in consultation with his/her major professor and submitted to the Graduate Adviser for approval. These nominations are then submitted to the Office of Graduate Studies for formal appointment in accordance with Graduate Council policy. The major professor acts as Chair of the committee.

**6. Advising Structure and Mentoring:** The graduate adviser will go over the degree requirements with all admitted graduate students including students in the integrated degree program. The Graduate Adviser and the staff adviser are available to discuss all matters pertinent to the graduate program. Students admitted to the Biological Systems Engineering Graduate Program work closely with their respective major professors. The **Mentoring Guidelines** can be found at <http://bae.engineering.ucdavis.edu/graduate/masters-students-guide/>

**7. Advancement to Candidacy:** Students admitted to the MS degree program (both Plans I and II) must file the advancement to candidacy form when they finish all the coursework on their program of study. Students are expected to advance to candidacy by the end of the fifth year. The Candidacy for the Degree of Master form can be found online at: <http://www.gradstudies.ucdavis.edu/forms/>. A completed form along with appropriate fees must be submitted before the thesis is submitted (Plan I) or Comprehensive Examination can be taken (Plan II). The form includes a list of courses the student has taken to complete degree requirements. If changes must be made to the student's course plan after s/he has advanced to candidacy, the Graduate Adviser must recommend these changes to Graduate Studies. Students must have their Graduate Adviser and committee Chair sign the candidacy

form before it can be submitted to Graduate Studies. If the candidacy is approved, the Office of Graduate Studies will send a copy to: the appropriate Graduate Program Coordinator and the student; the Comprehensive Examination Committee Chair will also receive a copy, if applicable. If the Office of Graduate Studies determines that a student is not eligible for advancement, the program and the student will be told the reasons for the application's deferral. Some reasons for deferring an application include: grade point average below 3.0, outstanding "I" grades in required courses, or insufficient units.

## **8. Thesis (Plan I) and Comprehensive Examination Requirements (Plan II):**

- a) Thesis Committee (MS Plan I):** The student, in consultation with the major professor and graduate adviser, nominate three (3) faculty members to serve on the Thesis Committee. These nominations are submitted to the Office of Graduate Studies for formal appointment in accordance with Graduate Council policy. The major professor serves as the chair of the committee.

The student will submit a draft of the thesis to the committee members and schedule an Exit Seminar by working with the seminar coordinator for the Biological and Agricultural Engineering Department for that quarter. If a student is presenting the seminar during the summer term, seminar coordinator for the Spring quarter should be contacted to schedule the seminar. The seminar can be scheduled only after completing the "Thesis and Dissertation Presentation Form" and getting signatures from the committee members and the Graduate Adviser. This form can be found at the site <http://bae.engineering.ucdavis.edu/graduate-forms/>.

Following the seminar, the thesis committee will meet in a closed door session and discuss the research, thesis and presentation and enter specific recommendations on the Exit Seminar Form and sign it. The student should present this form to the Graduate Adviser for final approval.

Student should address all the recommendations and work with the committee for the final approval of the thesis. Once the thesis is signed by all three members of the committee, student should submit it to the Office of Graduate Studies.

There are specific deadlines for submission of thesis for each quarter, which can be found in campus General Catalog (available online at the website of the Office of the Registrar). A candidate must be a registered student or in Filing Fee status at the time the program submits the form, with the exception of the summer period between the end of the Spring Quarter and the beginning of Fall Quarter

- b) Comprehensive Examination Committee (MS Plan II):** At the time of advancement to candidacy, students pursuing this option must set up a comprehensive examination committee of three faculty members in consultation with their major professor and submit it to the graduate adviser for approval. The chair of the examination committee and at least one other member must be in the Biological Systems Engineering Graduate Program. The format of the examination will be oral.

*i) Timing:* Students may take the comprehensive examination once they have advanced to candidacy. However, it is important that the timing of the exam satisfy the regulations as

noted in the CCGA handbook<sup>1</sup>, which indicates that the capstone requirement be completed at or near the end of the coursework for the Master’s degree.

**(ii) Outcome:** The Exam committee’s unanimous vote is required to pass a student on the exam. If a student does not pass the exam, the committee may recommend that the student be reexamined a second time, but only if the Graduate Adviser concurs with the committee. The second exam must take place within one quarter of the first exam. The format of the second exam is the same as that of the first exam and may include the submission of an amended version of the report. The examination may not be repeated more than once. A student who does not pass on the second attempt will be recommended for disqualification from further graduate work to the Dean of the Office of the Office of Graduate Studies. Once passed, the Master’s Report Form is signed by the Program Graduate Adviser and then forwarded to the Office of Graduate Studies. The deadlines for completing this requirement are listed each quarter in the campus General Catalog (available online at the website of the Office of the Registrar). A candidate must be a registered student or in Filing Fee status at the time the program submits the form, with the exception of the summer period between the end of the Spring Quarter and the beginning of Fall Quarter. The program must file the report with Graduate Studies within one week of the end of the quarter in which the student’s degree will be conferred.

**9. Normative Time to Degree:** The IDP is a special program for which the normative time is 18 months for MS I and one year for MS II after graduation from the BS degree program (may include Summer term of the senior year as well as Summer following the Spring quarter of first year as a graduate student).

**10. Typical timeline and sequence of events:**

**Plan I:**

Year	Fall	Winter	Spring	Summer
1	200 (2 units) + 5 units of graduate or upper division courses + 1 unit of 290C+ 299 (4 units)  Select guidance committee/submit	7 units of graduate or upper division courses +290C (1 unit) + 299 (4 units)	6 units of graduate or upper division courses +290C (1 unit) + 299 (5 units)	Complete Research **

<sup>1</sup> Appendix K, page 34, of

<http://www.universityofcalifornia.edu/senate/committees/ccga/ccgahandbook.pdf>

	program of study			
2	1 unit of 290C + 11 units of 299.	Present Exit Seminar and submit the thesis.		

\*\* MS I students are encouraged to start their research early during summer following graduation from their BS degree program.

**Plan II:**

Year	Fall	Winter	Spring	Summer
1	200 (2 units) + 6 units of graduate or upper division courses + 1 unit of 290 C + 299 (3 units)  Select guidance committee and submit program of study	10 units of graduate or upper division courses + 290C (1 unit) + 299 (1 unit)	9 units of graduate or upper division courses + 290C (1 unit) + 299 (2 units)	Take Comprehensive examination during Summer.

**11. Sources of Funding:** Almost all students in Biological Systems Engineering Graduate Program except for those in MS Plan II, are employed as Graduate Student Researchers (GSR), or Teaching Assistants (TA), or hold fellowships such as Biological Systems Engineering Fellowship, University Fellowships, or External Fellowships. These assistantships and fellowships are very competitive. Since MS Plan II does not involve a research thesis, Graduate Student Researcher (GSR) opportunities will be rare for students in the MS Plan II program. However, those in the MS Plan II program are eligible for a limited number of Teaching Assistantship (TA) positions within the department and may apply for TA positions elsewhere on campus. Furthermore, limited scholarships and fellowships are available to highly qualified students.

**12. PELP and Filing Fee Status:** The planned educational leave program (PELP) is available to students to suspend their program of studies for good cause (i.e. illness, temporary departure from the University for employment or research away from campus, financial problems, personal problems). Students on PELP may leave the campus and be guaranteed the right to return later to resume academic work. The minimum duration of PELP is one quarter and maximum duration is three quarters.

Note that students in the MS Plan II degree program are not eligible for Filing Fee status as there is no thesis requirement in this degree.

Additional information about PELP (Planned Educational Leave), In Absentia (reduced fees when researching out of state), and Filing Fee status can be found in the Graduate Student Guide: <http://www.gradstudies.ucdavis.edu/publications/>

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### **Integrated BS/MS Degree Program**

- Minimum of one 3 unit graduate course taken during senior undergraduate year
- Completion of MS Plan I or Plan II program

<b>MS Plan I</b>		<b>MS Plan II</b>	
Minimum Required Total (30)*	EBS 200 Research Methods (2)	EBS 200 Research Methods (2)	EBS 200 Research Methods (2)
	EBS 290 Seminar (1)	EBS 290 Seminar (1)	EBS 290 Seminar (1)
	Graduate or Upper Division Undergraduate Courses not required for EBS BS degree (5)	Graduate or Upper Division Undergraduate Courses not required for EBS BS degree (12)	Graduate or Upper Division Undergraduate Courses not required for EBS BS degree (12)
	Graduate Engineering Courses (12)	Graduate Engineering Courses (12)	Graduate Engineering Courses (12)
290C, 299 Research (minimum of 6 units required) plus other Graduate or Upper Division Undergraduate Courses as needed to meet the required 30 unit minimum total		290C, 299 Research (maximum of 9 units to count toward 36 unit minimum total) plus other Graduate or Upper Division Undergraduate Courses as needed to meet the required 36 unit minimum total	

+ thesis and exit seminar.

+ comprehensive oral examination.

**Figure 1. Course requirements for Integrated BS/MS Degree Program (see detail below for MS Plan I and II options).**