

## Combined BS in Biological Sciences and MS in Bioengineering

(Revised 12/8/11)

Biological Sciences undergraduates at Clemson University may begin a Master of Science (MS) degree in Bioengineering while completing their Bachelor of Science (BS) degree by using a limited number of courses to satisfy both degrees. The following specific requirements apply:

1. To be eligible for this plan (to file GS6BS/MS form), students must have completed their bachelor's curriculum through their junior year (minimum 90 credits) and have a minimum overall grade point ratio of 3.4.  
**Note:** The GRE requirement for admissions is eliminated for students with approved GS6BS/MS forms.
2. Students should select the PHYS 122, 124 and PHYS 221, 223 option to fulfill the physics requirement for their BS degree.
3. Students will be required to take the following courses (a-d) as undergraduates:
  - a. Calculus of Several Variables (MTHSC 206, 4 credits)  
-and-  
Intro to Ordinary Differential Equations (MTHSC 208, 4 credits)
  - b. Statics (C E 201, 3 credits)
  - c. Introduction to Materials Science (MS&E 210, 3 credits),  
-or-  
Introductory Circuit (ECE 307, 3 credits)
  - d. An additional junior-level engineering course: e.g., Biomechanics (BIOE 320), Biofluid Mechanics (BIOE 321) Bioinstrumentation (BIOE 370), Thermodynamics of Materials (MS&E 326), Transport Phenomena (MS&E 327), Mechanical Behavior of Materials (MS&E 422)
4. The following 600 level courses may be used to satisfy both the BS and MS requirements (up to 6 credits total):
  - a. Cell Biology (BIOSC 661, 3 credits).
  - b. Biotechnology for Bioengineers (BIO E 640, 3 credits).  
**Note:** This can be substituted with another 400/600-level course in BIOE, BioSci, or BIOCH, if it is not available, and students meet the pre-requisites for the course to be taken.
5. Students will most often enroll into the non-thesis MS program. Students may take the MS thesis option if they are able to arrange for a faculty member in either Biological Sciences or Bioengineering to be their thesis advisor for a defined research project. Those who intend to follow the thesis option may start their research as BIOSC 491 during their junior year and continue under this during their senior year. Beginning in the summer after their senior year students will enroll in BIO E 891 (6 credits total required) for thesis option or BIO E 892 (6 credits total required) for a non-thesis option. The intended outcome for the thesis student is publishable experimental research. The intended outcome for the non-thesis student is a paper based on library or limited laboratory work or both. Both types of students will undergo an oral exam in which they defend their project work and are tested on relevant general knowledge of biology and bioengineering.
6. As part of the graduate program students will be required to take Seminar in Bioengineering Research (BIO E 800, 1 credit each semester – only 1 credit counted towards degree requirements), Research Principles (BIO E 615, 1 credit), Biomaterials (BIO E 801, 3 credits); Biomedical Basis for Engineered Replacement (BIO E 846, 3 credits), and one of the following three courses: Structural Biomechanics (BIO E 820, 3 credits), Transport Processes in Bioengineering (BIO E 847, 4 credits), or Bioinstrumentation (BIO E 870, 3 credits). During the summer following their senior year students will enroll in Statistical Methods I (EX ST 801, 4 credits). These courses with an additional elective (600- or 800-level BIO E or BioSci, 2-3credit) course will fully satisfy the total of 30 credits required for the thesis option. Non-thesis students will need to take additional 5-6 credit hours as necessary to meet the 33 credits required; course selection to satisfy these additional credit hours should be made in consultation with the student's research advisor.

7. Students in a combined degree program are conditionally accepted to the graduate program until completion of the BS degree requirements. Students enrolled in the MS degree program should anticipate covering the full amount of tuition, fees, and living expenses for their MS degree. Under special circumstances, research assistantship support for MS thesis projects may be available from individual faculty members or teaching assistantship support from the Department of Biological Sciences.

Students interested in this combined BS/MS degree program should consult with their undergraduate advisor as early as possible in their undergraduate curriculum. Application should be made by the end of their junior year, but can be made at any time so long as the requirements for the program are met. Application is through the regular Graduate School process.