Bioengineering

BIOE 498  **Special Topics**  credit: 1 TO 4 hours.

Subject offerings of new and developing areas of knowledge in bioengineering intended to augment the existing curriculum. See Class Schedule or departmental course information for topics and prerequisites. 1 to 4 undergraduate hours. 1 to 4 graduate hours. May be repeated in the same or separate terms if topics vary to a maximum of 12 hours, but no more than 8 in any one term.

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<thead>
<tr>
<th>CRN</th>
<th>Type</th>
<th>Section</th>
<th>Time</th>
<th>Days</th>
<th>Location</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>70779</td>
<td>Seminar</td>
<td>FAR</td>
<td>04:00 PM - 05:50 PM</td>
<td>W</td>
<td>2101 - Everitt Laboratory</td>
<td>Kosari, F</td>
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Credit Hours: 1 hours
Note, this course meets every other week. This course will introduce students to ongoing translational research projects at the Mayo Clinic and related collaborative efforts between Mayo and UIUC. Major focus will be in design and development of various types of biomarkers (such as tissue, serum, imaging, etc.) and the related science and bioinformatics. Cancer biomarkers will be a major focus with guest lecturers from Mayo who are involved in the development and applications of these biomarkers in clinical assays. This course is intended for advanced undergraduate and graduate students interested in translational research projects and researchers interested in Mayo/UIUC collaborative initiatives. This course does not count for a Bioengineering track elective, but can be used for free elective hours.

| 70416   | Lecture       | JI      | 04:00 PM - 04:50 PM | MWF  | 3117 - Everitt Laboratory | Irudayaraj, J |

Credit Hours: 3 hours
Finite Element Mthds in Biomed
Restricted to students in the Bioengineering department.
Restricted to Undergrad - Urbana-Champaign.
This course will introduce students to the fundamentals of the finite element method as it is used in engineering modeling, design, and optimization. The finite element method is widely used to solve problems with inhomogeneous materials and complex boundary conditions. We will discuss one- and two-dimensional elements, coordinate systems, field problems (heat transfer and fluid flow problems), structural analysis, elasticity, evaluation and verification of numerical solutions, and computer-aided design and optimization of biomedical components. Applications will span multiscale physiology and bioengineering technologies. Prerequisites: BIOE 298, BIOE 201, and MATH 285, or their equivalents.

| 70240   | Lecture-Discussion | NIE     | 02:00 PM - 03:20 PM | TR   | 3117 - Everitt Laboratory | Nie, S       |

Credit Hours: 3 hours
Surgical Technologies
Restricted to students in the Bioengineering department.
Restricted to Undergrad - Urbana-Champaign.
This course will introduce students to technologies in use and in development for surgical procedures. Content will span surgical methodologies, instruments, and biomaterials, including advanced topics in intraoperative imaging, minimally invasive procedures, and surgical robotics. The course will focus on engineering and design principles with guest lectures by clinicians and MedTech industry specialists. Prerequisites: BIOE 205, BIOE 302, BIOE 303, and BIOE 414, or their equivalents.

| 63184   | Lecture       | WD      | 03:30 PM - 04:50 PM | TR   | 2310 - Everitt Laboratory | Dobrucki, W  |

Credit Hours: 3 hours
Preclinical Molecular Imaging
Restricted to students in the Bioengineering department.
Restricted to Undergrad - Urbana-Champaign.
Restricted to students in the Bioengineering department. Not intended for Grad-Urbana-Champaign. The goal of this course is to provide an educational foundation for bioengineering students in preclinical molecular imaging and impart a vision of future developments in the field.