**College of Engineering and Applied Science: MS Bioengineering Program Sheet**

The Master of Science in bioengineering requires 30 credit hours of coursework, including 3 to 6 credit hours of a master’s project or thesis.

|  |  |  |  |
| --- | --- | --- | --- |
| **Life Sciences Core (3 credits)** | | | |
| Course ID and Title | Semester Taken | Grade | Credits Earned |
| BIOE 5010 - Cell and Molecular Biology for Bioengineers (Fall Only) |  |  |  |
| BIOE 5011 - Systems Physiology for Bioengineers (Spring Only) |  |  |  |
| Life Sciences Core Earned Credit Subtotal: | | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Quantitative Methods Core (3 credits)** | | | |
| Course ID and Title | Semester Taken | Grade | Credits Earned |
| BIOE 5020 – Analytics and Machine Learning (Fall Only, REQUIRED) |  |  |  |
| Quantitative Methods Core Earned Credit Subtotal: | | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Technology Core (6 credits) -** Choose a minimum of 6 credits (usually two courses) from the following list. Please refer to the current class schedule for fall/spring course offerings. | | | |
| Course ID and Title | Semester Taken | Grade | Credits Earned |
| BIOE 5010 - Cell and Molecular Biology for Bioengineers (if not taken for Life Sciences core) |  |  |  |
| BIOE 5011 - Systems Physiology for Bioengineers (if not taken for Life Sciences core) |  |  |  |
| BIOE 5021 - Numerical Methods for Engineering Analysis |  |  |  |
| BIOE 5053 - Optics and Microscopy in Biomedical Research |  |  |  |
| BIOE 5054 - Regulatory Affairs |  |  |  |
| BIOE 5057 - Rehabilitation and Assistive Technology |  |  |  |
| BIOE 5063 - 3D Modeling for Bioengineers |  |  |  |
| BIOE 5064 - Advanced MatLab for Bioengineers and Life Scientists |  |  |  |
| BIOE 5068 - Introduction to Medical Imaging |  |  |  |
| BIOE 5067 – Human Factors and Usability Testing |  |  |  |
| BIOE 5069 - Advanced Biomechanics |  |  |  |
| BIOE 5073 - Neural Interfaces & Bionic Limbs |  |  |  |
| BIOE 5074 - Introduction to Laboratory Animal Research |  |  |  |
| BIOE 5083 - Polymers in Biomedical Applications |  |  |  |
| BIOE 5420 - Special Topics in Bioengineering (for the following topics only):   * Introduction to Design, Disability, and Aging * Mechatronics * Stem Cell and Regenerative Medicine * Biomedical Device Design and Entrepreneurship * Data Science Methods * MedTech Commercialization (1 credit) * Medical Device & Entrepreneurship: Market Access (2) * Image Processing for Bioengineers * Anatomy & Physiology and Medical Terminology * Bioengineering and Diabetes (1 credit) |  |  |  |
| BIOL 6764 - Biological Data Analysis |  |  |  |
| CSCI 5211 - Mobile Computing and Programming |  |  |  |
| ELEC 5638 - Digital Imaging Processing |  |  |  |
| ELEC 5667 - Wavelet Theory and Application |  |  |  |
| MECH 5020 - Biomechanics |  |  |  |
| MECH 5025 - Advanced Biomechanics |  |  |  |
| MECH 5175 - Finite Element Stress Analysis |  |  |  |
| MECH 5143 - Theory of Elasticity |  |  |  |
| **Students may also apply the following courses from the University of Colorado Boulder toward the Technology Core Requirement.** | | | |
| Course ID and Title | Semester Taken | Grade | Credits Earned |
| MCEN 5115 - Mechatronics & Robotics I (Boulder) |  |  |  |
| MCEN 5023 - Solid Mechanics I (Boulder) |  |  |  |
| Technology Core Earned Credit Subtotal: | | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Research & Clinical Core (3 credits)** | | | |
| Course ID and Title | Semester Taken | Grade | Credits Earned |
| BIOE 5041 - Clinical Experiences for Bioengineers (Spring only, 1 credit) |  |  |  |
| BIOE 5040 - Research Methods for Bioengineers (Spring Only, 2 credits) |  |  |  |
| Research & Clinical Core Earned Credit Subtotal: | | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Electives (9-12 credits) – In sciences, engineering, business, or related to the MS thesis or project** | | | |
| Course ID and Title | Semester Taken | Grade | Credits Earned |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Research & Clinical Core Earned Credit Subtotal: | | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Research (3-6 credits either Thesis or Project)** | | | |
| Course ID and Title | Semester Taken | Grade | Credits Earned |
| BIOE 6950 - MS Thesis |  |  |  |
| BIOE 6960 - MS Project |  |  |  |
| Research & Clinical Core Earned Credit Subtotal: | | |  |