



**Suggestions for undergraduate course selection for students considering the
Physics Stream of Medical Biophysics**

“All science is either physics or stamp collecting” :)
- *Ernest Rutherford, nuclear physicist and 1908 Nobel Laureate*

The above quote notwithstanding, students entering the Physics Stream of the Department of Medical Biophysics (MBP) do so with a variety of academic backgrounds and from various undergraduate programs. These include, but are not limited to, majors in Physics, Chemistry, Computer Science, Mathematics, and Engineering (Engineering Physics/Science, Electrical and Computer Engineering, Mechanical Engineering/Mechatronics, Nuclear Engineering, Biomedical Engineering, Nanotechnology Engineering, etc). Given this excellent diversity which MBP greatly values, prescribing a specific program of study and suggesting particular courses is difficult and may in fact be counter-productive. Instead, we offer the following considerations and guiding principles for undergraduates interested in entering the MBP Physics Stream:

1. Physics is indeed the central underlying theme of this Stream, so maximizing the number and variety of undergraduate physics courses (including advanced ones) is a definite asset.
2. The Stream’s emphasis on quantification is well met by taking some advanced undergraduate courses in mathematics, statistics, and other quantitative / computational sciences.
3. Some specialized upper-year undergraduate courses that may prove useful for the Physics Stream studies in MBP include those that cover topics in Nuclear Physics, Mathematical Methods in Physics, Physics of Medical Imaging, Photonics and Laser Physics, Acoustics, Signal Processing and Image Analysis, Linear Systems Theory, Modeling and Simulation Methods in Physics, and Radiation Physics.
4. It is NOT essential to admix your science/engineering major with “softer” undergraduate courses such as introduction to biophysics, survey courses in medical physics, overviews of medical instrumentation, physics for the life sciences, etc. There will be ample opportunity to acquire relevant expertise during graduate studies in MBP. Instead, we suggest that undergraduate studies be focussed on acquiring the core basic science/engineering skills, without “diluting” the curriculum with too many “softer” interdisciplinary offerings. That said, if the core is “solid” as per numbered points above, one or two such courses (or a basic biology / physiology course) may prove beneficial.