

## CCBM Fellows Training Requirements

CCBM Fellows should ideally have the in-depth disciplinary knowledge as well as the versatility needed to cross disciplinary boundaries and the ability to do team science in an interdisciplinary environment. The following training requirements were put together with the intention of giving all CCBM fellows a common grounding in basic techniques and skills from multiple disciplines that are important in the biophysical sciences, biomaterials and biotechnology.

Fellows are required to take:

1. All 3 Training modules –
  - a. Imaging and Spectroscopy
  - b. Nano-bio Fabrication
  - c. Computation and Modeling

AND

2. All 3 IB3 Core Courses\*<sup>#</sup>
  - d. Imaging and Spectroscopy (PHYS/BEST 231)
  - e. Nano-bio Fabrication (PHYS/BEST 232)
  - f. Computation and Modeling (PHYS/BEST 230)

PLUS any required coursework as specified by your graduate group. Note that these IB3 Core courses may also be used as electives in your respective graduate programs (please confirm with your graduate group).

These courses can be taken at any time during your graduate study, spread across years, in any order, before or after you take the Fellowship(s). Note that it is strongly recommended to take the corresponding module prior to, and preferably in the summer just before, taking the course. Note also that the course is of a seminar type with a mini-project and is not an advanced, intensive version of the module.

\*For students with Fellowships before and including Fall 2018, the Core IB3 courses are not required. Instead

- A total of 6 units of electives from among the following UCM and Outside courses (see tables on subsequent pages), provided they are taken before July 2018. After July 2018, only the core IB3 courses can be taken to satisfy any remaining elective units that are needed. As an example, if you still need 3 elective units (out of the CCBM required 6 units) after July 2018, you should take one of the IB3 courses to satisfy those 3 units.

# For students with Fellowships in Spring 2019 or later, who may already have taken some number of elective units, the requirements are

- A total of 6 units of electives from among the following UCM and Outside courses (see tables on subsequent pages), provided they are taken before July 2018.  
After July 2018, only the IB3 Core courses can be taken to satisfy any remaining elective units that are needed. As an example, if you still need 3 elective units (out of the CCBM required 6 units) after July 2018, you should take one of the IB3 Core courses to satisfy those 3 units.  
-PLUS one other IB3 Core course. As an example, if you still need 3 elective units (out of the CCBM required 6 units) after July 2018, you need to take 2 IB3 Core courses (one to satisfy the 3 remaining units plus one more course).

Note that if a course is required by your graduate group it cannot be used to satisfy an elective requirement for CCBM.

Note that if you have not taken any CCBM electives as of July 2018, you will need to take all three IB3 Core Courses.

A course that is not on the lists below may be considered for use as an elective on a case-by-case basis. Please contact your advisor and Prof. Gopinathan for approval.

UCSB Courses (no longer offered starting Fall 18):

- **BMSE 201A: Protein Structure and Function**
- **BMSE 201B: Chemistry & Structure of Nucleic Acids**
- **BMSE 201C: Biomembranes Structure & Function**
- **BMSE 215: Biophysical Thermodynamics**
- **BMSE 217: Electrostatics of Biopolymers**
- **BMSE 250: Bionanotechnology**
- **BMSE 271: Mechanical Force and Biomolecules**
- **BMSE 276A: Biomolecular Materials I: Structure and Function**
- **BMSE 276B: Biomolecular Materials II**
- **BMSE 293: Computational Methods Biochemistry & Molecular Biology**

Graduate Group	BioEngineering and Material Science and Engineering	Chemistry and Chemical Biology	Physics
UCM Elective Courses	<ul style="list-style-type: none"> <li>▪ <b>BEST 240:</b> Biomolecular Engineering</li> <li>▪ <b>BEST 214:</b> Tissue Engineering and Design</li> <li>▪ <b>BEST 211:</b> Synthetic Biology (EBICS)</li> <li>▪ <b>BEST 299:</b> Cell as a Machine (EBICS)</li> <li>▪ <b>BEST 299:</b> Mechanobiology in Plants and Animals (CEMB)</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>CHEM 214 or PHYS 212:</b> Statistical Mechanics</li> <li>▪ <b>CHEM 216:</b> Interfacial &amp; Surface Chemistry</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>PHYS 209:</b> Soft Matter Physics</li> <li>▪ <b>PHYS 204:</b> Biophysics</li> </ul>
Interdisciplinary Biophysical Sciences, Biomaterials and Biotechnology (IB3) Core Courses	<ul style="list-style-type: none"> <li>▪ <b>PHYS/BEST 230</b> Computation and Modeling for Interdisciplinary Biophysical Sciences, Biomaterials and Biotechnology</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>PHYS/BEST 231</b> Imaging and Spectroscopy for Interdisciplinary Biophysical Sciences, Biomaterials and Biotechnology</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>PHYS/BEST 232</b> Bio and Nano Fabrication for Interdisciplinary Biophysical Sciences, Biomaterials and Biotechnology</li> </ul>