Minor in Engineering Materials

Engineering materials have played a key role in shaping the evolution of the industry in the past. All the more so, in recent times, materials played a catalytic role in influencing the technological advancement and economic growth of nations. It is not a coincidence that the most advanced nations of the world are also most advanced in the know-how of materials, which ranges from synthetic to biological materials. Rapid strides in advancement in cutting-edge technologies, whether related to life sciences such as in biomaterials, or engineering such as in thin films, are dependent on the further growth in the knowledge related to materials. Some of the materials-sensitive technologies include Bioengineering, Nanotechnology, Information Technology and Wafer Level Packaging. In order to align ourselves with most of the leading economies and universities of the world, it is imperative that we create a network of programmes that drive our students into the exotic world of engineering materials.

The objectives of this multidisciplinary minor programme are as follows:

- To equip students with the fundamentals related to engineering materials, placing particular emphasis on advanced materials, design, manufacturing and processes,
- To enable students to be more aware of the behaviour of materials in engineering applications, and
- To enable students to select the materials for various engineering applications.

Open to all NUS undergraduate students, except those from the Department of Materials Science and Engineering

Requirements

To satisfy the Minor in Engineering Materials, a student must read materials related courses equivalent to at least 20 units as shown below:

- Two core courses from (MLE1101 or ME2151 or MLE1010 or MLE1111 or MLE1001 or MLE1001B or MLE2301) and (MLE2101 or MLE2102)
- The rest of the courses must be selected from the basket of courses under the track selected by the student
- At least 2 advanced elective courses (level-3000 to level-5000) from the track selected

Biomedical and Polymeric Materials

BN3301	Introduction to Biomaterials
BN4301	Principles of Tissue Engineering
CN4203R	Polymer Engineering
CM4251	Characterization Techniques in Materials Chemistry
CM4253	Materials Chemistry 2
CM4258	Advanced Polymer Science
MLE3104	Polymeric and Composite Materials
MLE3202/ MLE4239	Materials for Biointerfaces (MLE3202 recoded to MLE4239 wef AY26/27 Sem 1)
MLE4202	Selected Advanced Topics on Polymers
MLE4203	Polymeric Biomedical Materials
ME4253	Biomaterials Engineering

Electronic Materials

CM4254	Semiconductor Devices for sustainability
CN4223R	Microelectronic Thin Films (only for ChBE students)
CN5216	Electronic Materials and Energy Technologies (only for ChBE students)
EE4436	Fabrication Process Technology
MLE2105	Electronic Properties of Materials
MLE3105	Dielectric and Magnetic Materials
MLE4207	Microfabrication Process and Technology
MLE4211	Nanoelectronics and information technology
PC3235	Solid State Physics I
PC3242	Nanofabrication and Nanocharacterization

PC4240 Solid State Physics II
PC4253 Thin Film Technology
PC4259 Surface Physics
PC4264 Advanced Solid State Devices

Structural Materials

MLE2108 Structure of Mechanical Properties of Materials
MLE3102/
MLE4224 Degradation & Failure of Materials (MLE3102 recoded to MLE4224 wef AY25/26 Sem 2)
MLE3203 Engineering Materials
MLE4212 Advanced Structural Materials
ME3252 Materials for Mechanical Engineering
ME4255 Materials Failure

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