Biomedical Engineering

NEW CURRICULUM REQUIREMENTS (from Cohort AY2021/22 onward)	Units
COMMON CURRICULUM REQUIREMENTS – see Annex A	**60**
Singapore Studies	4
Cultures and Connections	4
Communities and Engagement	4
Critique and Expression	4
Digital Literacy	4
Data Literacy	4
Design Thinking	4
Maker Space	4
Systems Thinking *	4
Artificial Intelligence	4
Sustainable Futures *	4
Creating Narratives *	4
Project Management	4
Integrated Project	8
MAJOR REQUIREMENTS	**60**
Engineering Core	**20**
MA1511 Engineering Calculus	2
CE2407A Uncertainty Analysis for Engineers	2
CE2407B Introduction to Numerical Methods for Engineers	2
MA1513 Linear Algebra with Differential Equations	2
EG2401A Engineering Professionalism	2
EG3611A Industrial Attachment[1] (or equivalent)	10
Major Programme	**40**
BN1111 Biomedical Engineering Principles and Practice I	4
BN2111 Biomedical Engineering Principles and Practice II	4
BN2301 Biochemistry and Biomaterials for Bioengineers	4
BN2102 Bioengineering Data Analysis	4
BN2201 Quantitative Physiology for Bioengineers	4
BN2204 Fundamentals of Biomechanics	4
BN2403 Fundamentals of Biosignals and Bioinstrumentation	4
BN3101A Biomedical Engineering Design OR BN3101B Clinical Immersion and HealthTech Innovation	4
Technical Electives – see Annex B	8
UNRESTRICTED ELECTIVES	**40**
Build Your Own Degree	
TOTAL	**160**

* Depending on matriculation year, one, two, or three of these courses marked with * will be **substituted** by a basket of additional technical courses. Please refer to the important notice at https://cde.nus.edu.sg/undergraduate/curriculum-structure/ for more details. The basket of additional technical courses for BME students comprises

1. BN2104 Medical Technology for public and global health OR a BME technical elective (see Annex B)
2. BN2105 Medical devices life cycle management
3. BN3406 Medical Imaging and AI applications

[1] Engineering students may take up to 20 units of credit-bearing internships, of which up to 10 units can be used to fulfil the major internship requirement and the remaining will be counted towards Unrestricted Electives. This limit does not apply to students enrolled in the co-op degree programme.

Annex A: Catalogue of courses in the Common Curriculum

	B.Eng.
Common Curriculum Pillar	**Basket of Courses[3]**
Singapore Studies	Students may read any course from the curated list of courses as approved by the NUS General Education Committee for this pillar.
Cultures and Connections	Students may read any course from the curated list of courses as approved by the NUS General Education Committee for this pillar.
Communities and Engagement	Students may read any course from the curated list of courses as approved by the NUS General Education Committee for this pillar.
Critique and Expression	ES2631 Critique and Communication of Thinking and Design
Digital Literacy	CS1010% Programming Methodology (any variant)
Data Literacy	GEA1000 Quantitative Reasoning with Data
Design Thinking	DTK1234 Design Thinking
Maker Space	EG1311 Design and Make
Systems Thinking	IE2141 Systems Thinking and Dynamics *
Artificial Intelligence	EE2211 Introduction to Machine Learning
Sustainable Futures	CDE2501 Liveable Cities *
Creating Narratives	CDE2000 Creating Narratives *
Project Management	PF1101 Fundamentals of Project Management
Integrated Project	Complete 8 Units from the following list of courses: • BN4101 B.Eng. Dissertation • XFE4401 Integrated Honours Project • EG4301 DCP Dissertation[4] • EG4301A Ideas to Start-up[4]

[3] The listing of courses is expected to grow and evolve over time, to suit curricular needs.
[4] EG4301 is a 12-unit course that forms part of the Innovation and Design Second Major. Students taking this will fulfil the Integrated Project pillar (8 units) and an additional 4 units of Unrestricted Electives.

Annex B

List of Technical Elective courses:	
BN2001 Independent Study BN2105 Medical Device Life Cycle Management BN3202 Musculo-Skeletal Biomechanics BN3301 Introduction to Biomaterials BN3402 Bio-Analytics for Engineers BN3501 Equilibrium & Kinetic Bioprocesses BN4102 Gerontechnology in Ageing BN4103 Assistive Technology for Persons with Disability BN4108 Biomedical Engineering for Global Health BN4109 Special Topics in Bioengineering BN4202 Biofluids Dynamics BN4202A Computational Biofluid Dynamics BN4203 Robotics in Rehabilitation BN4206 Computational methods in Biomedical Engineering BN4207 Microrobotics BN4301 Principles of Tissue Engineering BN4302 Organs in a Dish: Organoid Bioengineering BN4303 Tissue Engineering for Designing Food BN4304 Engineering Strategies for Gene and Cell Manufacturing BN4402 Electrophysiology BN4403 Cellular Bioengineering BN4404 Biomicroelectromechanical Systems-BioMEMs) BN4406 Biophotonics and Bioimaging BN4501 Engineering Biology BN4601 Intelligent Medical Robotics BN4701 Serious Games for Health BN5104 Quantitative Physiology Principles in Bioengineering BN5201 Advanced Biomaterials BN5202 Orthopaedic Biomechanics	BN5203 Advanced Tissue Engineering BN5205 Computational Biomechanics BN5207 Medical Imaging Systems BN5208 Biomedical Quality and Regulatory Systems BN5209 Neurosensors and Signal Processing BN5210 Biosensors & Biochips EE2023 Signals and Systems EE4603 Biomedical Imaging Systems EE4705 Human-Robot Interaction LSM2212 Human Anatomy LSM2233 Cell Biology LSM2241 or ZB2101 Introductory Bioinformatics LSM3241 or ZB3101 Genomic Data Analysis ME2162 Manufacturing Processes ME4233 Computational Methods in Fluid ME4242 Soft Robotics ME4245 Robot Mechanics and Control ME4253 Biomaterials Engineering ME4291 Finite Element Analysis MLE4203 Polymeric Biomedical Materials MT5007 Management of Technological Innovation PC2267 Biophysics I PC3267 Biophysics II PC4267 Biophysics III