

**Overall Credit Structure**

BS (Basic Sciences)	24	Life skills	2
GE (General Engineering)	24	English language learning	2
HS (Humanities and Social Sciences)	15	Departmental project, internship experience	2
DC (Departmental Core)	62	NCC / NSO / NSS	2
DE (Departmental Electives)	18	Total Non-Graded Units	8
OC (Open Category)	9		
Total Graded Credit Requirement	152		

Programme Learning Outcomes

PLO 1 Analyze, synthesize and communicate ideas.

PLO 2 Demonstrate scientific temperament, integrity, personal and professional responsibility, and respect for others.

PLO 3 Identify, analyze and solve challenging problems within and across disciplines.

PLO 4 Apply their analytical skills to other areas of knowledge and design sustainable solutions to issues important in our society ethically.

General Engineering Core

<u>ELL1000</u>	Introduction to Electrical Engineering	2	1	2	4
<u>MEL1140</u>	Thermodynamics	3	0	2	4
<u>COL1000</u>	Introduction to Programming	3	0	2	4
<u>ELL1401</u>	Digital Electronics	3	0	2	4
<u>MEP1000</u>	Engineering Visualization	0.5	0	3	2
<u>MEP1001</u>	Manufacturing for Product Innovation	0.5	0	3	2

Basic Science Core

<u>PYL1002</u>	Waves and Oscillations	2	1	0	3
<u>PYP1000</u>	Physics Laboratory	0	0	4	2
<u>MTL1001</u>	Mathematics I Calculus	3	1	0	4
<u>CMP1000</u>	Chemistry Laboratory	0	0	4	2
<u>MTL1002</u>	Mathematics II Linear Algebra and Differential Equations	3	1	0	4
<u>SBP1100</u>	Experimental Biology for Engineers	0	0	2	1

Departmental Core

<u>PYD3016</u>	Engineering Physics Project I/Capstones Project	-	-	-	-
<u>PYL1012</u>	Mathematical Physics	3	1	0	4
<u>PYL2003</u>	Classical Mechanics	3	1	0	4
<u>PYL2004</u>	Optics and Photonics	-	-	-	-
<u>PYL2013</u>	Quantum Mechanics I	3	1	0	4
<u>PYL2014</u>	Statistical Physics	-	-	-	-
<u>PYL2023</u>	Electrodynamics	3	1	0	4
<u>PYL2024</u>	Quantum Mechanics II	-	-	-	-
<u>PYL3006</u>	Nuclear and Elementary Particle Physics	-	-	-	-
<u>PYL3015</u>	Condensed Matter Physics	-	-	-	-
<u>PYL3025</u>	Computational Physics	-	-	-	-
<u>PYL3035</u>	Experimental Methods in Physics	-	-	-	-
<u>PYP2003</u>	Engineering Physics Laboratory-I	0	0	6	3
<u>PYP2004</u>	Engineering Physics Laboratory - II	-	-	-	-
<u>PYP3005</u>	Engineering Physics Laboratory - III	-	-	-	-
<u>PYP3006</u>	Engineering Physics Laboratory - IV	-	-	-	-

Humanities and Social Sciences Electives

<u>HSL2100</u>	Introduction to Economics	3	0	0	3
<u>HSL2102</u>	Macroeconomics	3	0	0	3
<u>HSL2510</u>	Philosophy Through Puzzles and Paradoxes	3	0	0	3
<u>HSL2605</u>	Sociological Perspectives on Organisations	3	0	0	3
<u>HSL2710</u>	Words in the World	3	0	0	3
<u>HSL2742</u>	Fundamentals of Language Sciences	3	0	0	3

Basic Science Electives

<u>CML1001</u>	Structural Insights into Atoms and Molecules	2 1 0 3
<u>CML1002</u>	The Art and Science of Building Molecules and Materials	2 1 0 3
<u>PYL1001</u>	Introduction to Electrodynamics	2 1 0 3
<u>PYL1003</u>	Mechanics and Special Theory of Relativity	2 1 0 3
<u>SBL1100</u>	Introduction to Biology	2 0 0 2
<u>SBL1102</u>	Modern Biology: Principles and Applications	2 1 0 3

General Engineering Electives

<u>AML1000</u>	Engineering Mechanics	3 1 0 4
<u>COL1101</u>	Programming with Data Structures	3 0 2 4
<u>CVL2001</u>	Climate Change and Adaptation	2 0 0 2
<u>ELL1205</u>	Signals and Systems	3 1 0 4
<u>MLL1001</u>	Introduction to Materials Science and Engineering	3 0 2 4
<u>MTL2006</u>	Introduction to Probability and Stochastic Processes	3 1 0 4
<u>MTL2008</u>	Introduction to Probability and Statistics	3 1 0 4

Departmental Electives

<u>OPL7777</u>	Statistical Methods for Science and Engineering	3 0 0 3
<u>PYL7001</u>	Physical Foundations of Materials Science	3 0 0 3
<u>PYL7049</u>	Quantum Information and Computation	3 0 0 3
<u>PYL7053</u>	Optical System Design	2 0 2 3
<u>PYL7055</u>	Basic Optics and Optical Instrumentation	3 0 0 3
<u>PYL7070</u>	Ultrafast Optics and Applications	3 0 0 3
<u>PYL7120</u>	Applied Superconductivity	3 0 0 3
<u>PYL7130</u>	Plasma Theory and Simulations	3 0 0 3
<u>PYL7140</u>	Advanced Theory of Condensed Matter	3 0 0 3
<u>PYL7141</u>	Quantum Field Theory 1	3 0 0 3
<u>PYL7143</u>	Group Theory in Physics	3 0 0 3
<u>PYL7144</u>	The Standard Model of Elementary Particles	3 0 0 3
<u>PYL7151</u>	Astronomy and Astrophysics I	3 0 0 3
<u>PYL7167</u>	Atomic and Molecular Physics	3 0 0 3
<u>PYL7171</u>	Relativity and Gravitation	3 0 0 3
<u>PYL7545</u>	Topology in Condensed Matter Physics	3 0 0 3
<u>PYL7560</u>	Fourier Optics and Holography	3 0 0 3
<u>PYL7590</u>	Computational Optical Imaging	3 0 0 3

Semester-wise Schedule

1	ELL1000 Introduction to Electrical Engineering (2.0-1.0-2.0) 4.00	MEL1140 Thermodynamics (3.0-0.0-2.0) 4.00	PYL1002 Waves and Oscillations (2.0-1.0-0.0) 3.00	PYP1000 Physics Laboratory (0.0-0.0-4.0) 2.00	MTL1001 Mathematical Calculus I (3.0-1.0-0.0) 4.00	DAN1100 Life Skills 1 (0.0-0.0-1.5) 0.75	English Language Courses (0-0-2) 1 NGU	24.5	1.75	17
2	COL1000 Introduction to Programming (3.0-0.0-2.0) 4.00	CML1002 The Art and Science of Building Molecules and Materials (2.0-1.0-0.0) 3.00	CMP1000 Chemistry Laboratory (0.0-0.0-4.0) 2.00	MTL1002 Mathematical Calculus II Linear Algebra and Differential Equations (3.0-1.0-0.0) 4.00	PYL1012 Mathematical Physics (3.0-1.0-0.0) 4.00	English Language Courses (0-0-2) 1 NGU		22	1	17
3	PYL2003 Classical Mechanics (3.0-1.0-0.0) 4.00	ELL1401 Digital Electronics (3.0-0.0-2.0) 4.00	PYL2013 Quantum Mechanics I (3.0-1.0-0.0) 4.00	PYL2023 Electrodynamics (3.0-1.0-0.0) 4.00	PYP2003 Engineering Physics Laboratory-I (0.0-0.0-6.0) 3.00	HS (3-0-0) 3		26	0	22
4	PYL2004 Optics and Photonics (3.0-1.0-0.0) 4.00	PYL2014 Statistical Physics (3.0-1.0-0.0) 4.00	PYL2024 Quantum Mechanics II (3.0-1.0-0.0) 4.00	MEP1000 Engineering Visualization (0.5-0.0-3.0) 2.00	PYP2004 Engineering Physics Laboratory - II (0.0-0.0-6.0) 3.00	SBP1100 Experiments for Engineers (0.0-0.0-2.0) 1.00	SBL1100 Introduction to Biology (2.0-0.0-0.0) 2.00	DAN2100 Life Skills 2 (0.0-0.0-0.5) 0.25	BS (2-1-0) 3	30 0.75 23

5	PYL3005 Artificial Intelligence and its Applications in Physics (3.0-1.0-0.0) 4.00 PYL3015 Condensed Matter Physics (3.0-1.0-0.0) 4.00 PYL3025 Computational Physics (3.0-0.0-2.0) 4.00 PYL3035 Experimental Methods in Physics (3.0-0.0-0.0) 3.00 PYP3005 Engineering Physics Laboratory - III (0.0-0.0-6.0) 3.00 HS (3-0-0) 3	25	0	21
6	PYL3006 Nuclear and Elementary Particle Physics (3.0-1.0-0.0) 4.00 PYP3006 Engineering Physics Laboratory - IV (0.0-0.0-6.0) 3.00 MEP1001 Manufacturing for Product Innovation (0.5-0.0-3.0) 2.00 HS (3-0-0) 3 GE (3-1-0) 4 DE 1 PH1 capstone or B.Tech. project (0-0-6) 3	29.5	0	22
7	HS (3-0-0) 3 DE 2 DE 3 DE 4 OC (3-0-0) 3	15	0	15
8	HS (3-0-0) 3 DE 5 DE 6 OC (3-0-0) 3 OC (3-0-0) 3	15	0	15