B.Eng (Hons) in Bioengineering with 2nd Major in Data Analytics

with Professional Internship

AY2024- 2025 Intake onwards (BEDA)

		Number of Academic Units (AU)							
Programme	Year of Study	Major Requirement		Interdisciplinary Collaborative Core		Broadening and			
		Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core (FC)	Deepening Electives (BDE)	Total		
	1	21/22* [4]		9			30/31* [4]		
Bioengineering with Second	2	26 [6]	3	8	3		40 [6]		
Major in Data	3	13			12	6	31		
Analytics	4	17	3			16	36		
	Total	77/78* [10]	6	17	15	22	137/138* [10]		

Category			AU	Total AU	
	Common	Core (University-level)			
		quiry and Communication in the linary World	2		
	CC0002 Na	avigating the Digital World	2	17	
	CC0003 Et	hics & Civics in a Multi-Cultural World	2		
	CC0005 He	ealthy Living & Wellbeing	3		
Interdisciplinary Collaborative	CC0006 Su	stainability: Society, Economy & Environment	3		
Core (ICC)	CC0007 Sc	ience & Technology for Humanity	3		
	ML0004 C	areer and Entrepreneurial Development for World	2		
	Foundatio	nal Core (College-level)			
		ngineering Communication	2	15	
	CB0494 In Intelligence	troduction to Data Science and Artificial e	3		
	BG3920 Pr	10			
	BIE Core				
	EG1001	Engineers In Society	2		
Major Requirement	MH1810	Math 1	3		
	PH1011*	Physics	3	12	
	CB1102	Introduction to Chemical and Biomedical Engineering	1		
	CB1103	Organic Chemistry For Engineers	3		

	CB1117^	Engineering Mathematics	4	
		Cellular & Molecular Biology for	·	
	BG1141	Bioengineers	3	
	BG1801	Bioengineering Lab 1A	1	
	BG1802	Bioengineering Lab 1B	1	
	BG2103	Signal Processing in Biosystems	3	
	BG2104	Electronics for Biomedical Engineering	3	
	BG2110	Bioelectricity	3	
	BG2119	Anatomy and Physiology	3	
	BG2131	Biomaterials	3	
	BG2142	Biological Thermodynamics	3	
	BG2209	Mechanics for Bioengineers	3	
		-		65
Major	BG2211^	Introduction to Computational Thinking	3	
Requirement	BG2801	Bioengineering Lab 2A	1	
	BG2802	Bioengineering Lab 2B	1	
	BG3102	Control in Biosystems	3	
	BG3104	Biomedical Imaging	3	
	BG3105	Biomedical Instrumentation	3	
	BG3112	Cardiovascular Engineering	3	
	BG3801	Bioengineering Lab 3	1	
	BG4104	Machine Learning and Optimization for	3	
	DC4122	Bioengineers Medical Device Design	_	
	BG4122 BG4801		6 8	
	BG4601	Final Year Project	٥	
	BIE Major	Prescribed Electives (MPE)		
	CH2010^	Engineering Statistics	3	C
	BIE PE 2		3	6
	Doto Anali			
	1	ytics Compulsory Courses Algebra: CB1117 Engineering Mathematics	NA	
		ing Skills: BG2211 Introduction to	NA	
	Computational Thinking			
	3) Probabi	lity and Statistics: CH2010 Engineering	NA	
	Statistics	mar MIII 402 Algorithmas 9 Commiting		
	_	ms: MH1403 Algorithms & Computing	3	
	I -	se: EE4791 Database Systems	3	
	Mining	ning: EE4483 Artificial Intelligence & Data	3	
	1	sualisation/Management: BC2406 Analytics I:		
	Visual and	Predictive Techniques	4	
2nd Major in Data	3			22
Analytics (BDEs)	Electives			
	CH4244	Numerical Method and Data Analytics	3	
		·		
	CB4246	Optimisation Using Artificial Intelligence from the following:	3	
	1	achine Learning Design & Application (3AU)		
		ttern Recognition & Machine Learning (3AU)		
I	LL+43/ Pd	ttern necognition & Machine Learning (SAU)	I	l l

MA4830 Real Time Software for Mechatronics System (3AU) MA4832 Microprocessor System (3AU) MS4671 Introduction to Materials Simulation (3AU)	Total		137	7/138*
MA4829 Machine Intelligence (3AU)		MA4830 Real Time Software for Mechatronics System (3AU) MA4832 Microprocessor System (3AU)	3	

^{*}Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU).

[^]Counted towards 2nd Major in Data Analytics requirement (total 10AU)

^[] AU of courses that could be used to fulfil Core/MPE requirment and 2nd Major requirment concurrently

Introduction to Chemical and Biomedical C 1 CB103 Organic Chemistry For Engineers C 3 CB114 Cellular & Molecular Biology for Bioengineers C 3 CB1117 Engineering Mathematics C 4 CB1117 Engineering Mathematics C 4 CB1117 Engineering Mathematics C 4 CB1117 Engineering Lab 18 C 1 CB1101 CB1117 Engineering Lab 18 C 1 CB1101 CB1117 CB1	Suggeste	Bioengineering) with 2nd Major in Data Anal Id Study Plan for AY2024-2025 intake (BEDA) Internship	ytics						
Secretary Course	Year 1 Semester 1 Course		Туре	AU	_		emester 2	Туре	AU
Biologineering Lab 1A C 1 Biologineering Lab 1B C 1	CB1102		С	1		CB1103	Organic Chemistry For Engineers	С	3
Military	BG1141	Cellular & Molecular Biology for Bioengineers	С	3		^CB1117	Engineering Mathematics	С	4
PH1011 Physics C 3 C 3 C C 2 C C 2 C C 2 C C	BG1801	Bioengineering Lab 1A	С	1		BG1802	Bioengineering Lab 1B	С	1
CC0005 Healthy Living & Wellbeing CC 3	MH1810	Math 1	С	3		EG1001	Engineers in Society	С	2
Physics Communication in the Interdisciplinary World	PH1011	,	С	3					
Interdisciplinary World	PH1012		С	4					
Type Au	CC0001		CC	2					
Vear 2 Semester 1	CC0002	· · · · · · · · · · · · · · · · · · ·	CC	2					
Course Type AU Course Type AU BG2119 Anatomy and Physiology C 3 BG2103 BIG2104 Electronics for Biomedical Engineering C 3 BG2112 Biomaterials C 3 BG2104 Electronics for Biomedical Engineering C 3 BG2211 Introduction to Computational Thinking C 3 BG2209 Mechanics for Bioengineering Lab 28 C 1 BG2201 Isloengineering Lab 2A C 1 BG2209 Mechanics for Bioengineering Lab 28 C 1 CC00006 Sustainability: Society, Economy & Environment CC 3 CC00007 Science & Technology for Humanity CC 3 ML-0004 Care and Entrepreneurial Development for the Future World CC 2 CB0494 Introduction to Data Science and Artificial for Intelligence FC 3 Year 3 Semester 1 Type AU BG3102 Control in Biosystems C 3 BG3102 Control in Biosystems C 3 BG4104 BG3102 </th <th></th> <th></th> <th></th> <th>15</th> <th>-* 16</th> <th></th> <th></th> <th></th> <th>15</th>				15	-* 16				15
BG2119 Anatomy and Physiology C 3 BG2103 Signal Processing in Biosystems C 3 BG2113 Blomaterials C 3 BG2104 Electronics for Biomedical Engineering C 3 BG2119 Bloodigal Thermodynamics C 3 BG2104 Electronics for Biomedical Engineering C 3 BG2801 Bloengineering Lab 2A C 1 BG2802 Bloengineering Lab 2B C 1 BG2802 Bloengineering Lab 2B C 1 C 3 BG2802 Bloengineering Lab 2B C 1 1 C 3 BG2802 Bloengineering Lab 2B C 1 1 C 3 CC0007 Science & Technology for Humanity CC 3 CC00007 Science & Technology for Humanity CC 3 CC00000 Science & Technology for H	Year 2 S	emester 1				Year 2 S	emester 2		
BG21131 Blomaterials	Course		Type		_				
BG2142 Biological Thermodynamics C 3 BG22110 Bioelectricity C 3 BG2811 Bioengineering Lab 2A C 1 BG2802 Bioengineering Lab 2B C 1 CC0006 Sustainability: Society, Economy & CC C 3 CC0007 Science & Technology for Humanity CC 3 ML0004 Career and Entrepreneurial Development for Enture World CC 2 CB0494 Introduction to Data Science and Artificial Intelligence FC 3 **CH2010 Engineering Statistics MPE 3 **Year 3 Semester 1 **CH2010 Engineering Statistics Type AU **General Engineering Statistics **Denomination Statistics **C 3 **BG3920 Professional Internship FC 3 **Year 3 Semester 1 **Course Type AU **BG3920 Professional Internship FC 10 **Semester 1 **Course **Semester 2 **Course **Type AU **Semester 2 **Semester 3 **Semester 4 **Semester 4 **Semester 4	BG2119	Anatomy and Physiology	•	3		BG2103	Signal Processing in Biosystems	С	3
BG2211 Introduction to Computational Thinking C 3 BG2201 Bioengineering Lab 2A C 1 BG2802 Bioengineering Lab 2A C 1 BG2802 Bioengineering Lab 2B C 1 CC0006 CC0007 CC007	BG2131	Biomaterials	С	3		BG2104	Electronics for Biomedical Engineering	С	3
BG2801 Bioengineering Lab 2A C 1 BG2802 Bioengineering Lab 2B C 1							3		
Sustainability: Society, Economy & CC 3 CC0007 Science & Technology for Humanity CC 3							_		
Environment CC 3 CC 2 CB0494 Introduction to Data Science and Artificial Intelligence	BG2801	Bioengineering Lab 2A	С	1		BG2802	Bioengineering Lab 2B	С	1
## Future World ## Future Worl	CC0006		CC	3		CC0007	Science & Technology for Humanity	CC	3
Year 3 Semester 1	ML0004		СС	2		CB0494		FC	3
Year 3 Semester 1 Type AU Year 3 Semester 2 Type AU BG3102 Control in Biosystems C 3 BG3920 Professional Internship FC 10 BG3105 Biomedical Instrumentation C 3 BG3105 Biomedical Instrumentation C 3 BG3105 Biomedical Instrumentation C 3 BG3820 Professional Internship FC 10 BG3105 Biomedical Instrumentation C 3 BG3820 Professional Internship FC 10 BG3106 Biomedical Instrumentation C 3 BG3820 Professional Internship FC 10 BG3107 Biomedical Instrumentation FC 1 3 BG3106 Biomedical Instrumentation FC 2 1 CH4244 Numerical Method and Data Analytics BDE 3 3 DA Elective 2 BDE 3 3 BG4104 Biomedical Instrumentation FC 2 2 Year 4 Semester 1 Year 4 Semester 2 Type AU Year 4 Semester 2 Course Type AU Year 4 Semester 2 Type AU Au Year 4 Semester 2 Course Type AU BG4104 Bioenginerin	^CH2010	Engineering Statistics	MPE	3					
Course				21	-				19
BG3102 Control in Biosystems C 3 BG3104 Biomedical Imaging C 3 BG3105 Biomedical Instrumentation C 3 BG3112 Cardiovascular Engineering C 3 BG3801 Biomedical Instrumentation C 3 BG3801 Biomedical Instrumentation C 3 BG3801 Bioengineering Lab 3 C 1 HW0288 Engineering Communication FC 2 CH4244 Numerical Method and Data Analytics DA Elective 2 BDE 3 BG4104 DA Elective 2 Type AU BG4104 Bioengineers Machine Learning and Optimization for Bioengineers C 3 BG4102 Medical Device Design C 3 BG4103 Final Year Project C 4 BG4104 Final Year Project C 4 BG4105 Final Year Project C 4 BG4106 Analytics I: Visual and Predictive Techniques BDE 3 BC2406 Analytics I: Visual and Predictive Techniques BDE 4 BDE 3 CB4246 Optimisation Using Artificial Intelligence BDE 3 CB4246 Optimisation Using Artificial Intelligence BDE 3 Total (AU) Total (AU)	Year 3 S	emester 1				Year 3 S	emester 2		
BG3104 Biomedical Imaging C 3 BG3105 Biomedical Instrumentation C 3 BG3107 Cardiovascular Engineering C 3 BG3801 Bioengineering Lab 3 C 1	Course				-				
BG3105 Biomedical Instrumentation C 3 BG3112 Cardiovascular Engineering C 3 BG3801 Bioengineering Lab 3 C 1 HW0288 Engineering Communication FC 2 CH4244 Numerical Method and Data Analytics BDE 3 DA Elective 2 BDE 3 Year 4 Semester 1 Year 4 Semester 2 Course Type AU BG4104 Machine Learning and Optimization for Bioengineers C 3 BG4122 Medical Device Design C 3 BG4122 Medical Device Design C 3 BG4801 Final Year Project C 4 BG4801 Final Year Project C 4 BIE PE 2 MPE 3 BC2406 Analytics I: Visual and Predictive Techniques BDE 3 MH1403 Algorithms & Computing BDE 3 CB4246 Optimisation Using Artificial Intelligence BDE 3 CB4246 Optimisation						BG3920	Professional Internship	FC	10
BG3801 Bioengineering Lab 3 C 1 HW0288 Engineering Communication FC 2 CH4244 Numerical Method and Data Analytics BDE 3 DA Elective 2 BDE 3 Year 4 Semester 1 Course Type AU BG4104 Machine Learning and Optimization for Bioengineers BG4102 Medical Device Design C 3 BG4801 Final Year Project C 4 BIE PE 2 MPE 3 MH1403 Algorithms & Computing BDE 3 MH403 Algorithms & Computing BDE 3 CB4246 Optimisation Using Artificial Intelligence BDE 3 CB4246 Optimisation Using Artificial Intelligence BDE 3 Total (AU) Total (AU) 137									
HW0288 Engineering Communication FC 2 CH4244 Numerical Method and Data Analytics BDE 3 DA Elective 2 21 Year 4 Semester 1 Course Type AU BG4104 Machine Learning and Optimization for Bioengineers BG4122 Medical Device Design C 3 BG4122 Medical Device Design C 3 BG4801 Final Year Project C 4 BG4801 Final Year Project C 4 BE4483 Artificial Intelligence & Data Mining BDE 3 BC2406 Analytics I: Visual and Predictive Techniques BDE 4 Type AU Year 4 Semester 2 Course Type AU BG4801 Final Year Project C 4 BG4801 Final Year Project C 4 BE4483 Artificial Intelligence & Data Mining BDE 3 BC2406 Analytics I: Visual and Predictive Techniques BDE 4 Total (AU) Total (AU) 10 Total (AU)									
CH4244 Numerical Method and Data Analytics DA Elective 2 21 Year 4 Semester 1 Course BG4104 Machine Learning and Optimization for Bioengineers BG4102 Medical Device Design C 3 BG4801 Final Year Project C 4 BG4801 Final Year Project C 4 BG4803 Artificial Intelligence & Data Mining BC2406 Analytics I: Visual and Predictive Techniques BDE 3 BC2406 Optimisation Using Artificial Intelligence BDE 3 CB4246 Optimisation Using Artificial Intelligence BDE 3									
Page 4 Semester 1 Course Type AU BG4104 Machine Learning and Optimization for Bioengineers BG4102 Medical Device Design BG4122 Medical Device Design C 3 BG4801 Final Year Project C 4 BIE PE 2 MPE 3 BG4803 Artificial Intelligence & Data Mining BDE 3 BC2406 Analytics I: Visual and Predictive Techniques BDE 3 Total (AU) Total (AU) Type AU Year 4 Semester 2 Course Type AU Semester 2 Course Type AU BG4102 Medical Device Design C 3 BG4102 Medical Device Design C 4 BIE PE 2 MPE 3 EE4791 Database Systems BDE 3 CB4246 Optimisation Using Artificial Intelligence BDE 3 Total (AU) Total (AU)	HW0288	Engineering Communication	FC	2					
Year 4 Semester 1 Course BG4104 BG4104 Bioengineers BG4122 Medical Device Design BG4801 Final Year Project BG4801 Final Year Project BC4483 BC2406 Analytics I: Visual and Predictive Techniques BC2406 Type AU Course BG4122 Medical Device Design C 3 BG4801 Final Year Project C 4 BIE PE 2 MPE 3 MH1403 Algorithms & Computing BDE 3 BC2406 Analytics I: Visual and Predictive Techniques BDE 3 CB4246 Optimisation Using Artificial Intelligence BDE 3 Total (AU) Total (AU)	CH4244								
CourseTypeAUCourseTypeAUBG4104Machine Learning and Optimization for BioengineersC3BG4122Medical Device DesignC3BG4122Medical Device DesignC3BG4801Final Year ProjectC4BG4801Final Year ProjectC4BIE PE 2MPE3EE4483Artificial Intelligence & Data MiningBDE3MH1403Algorithms & ComputingBDE3BC2406Analytics I: Visual and Predictive TechniquesBDE4EE4791Database SystemsBDE3CB4246Optimisation Using Artificial IntelligenceBDE3CB4246Optimisation Using Artificial IntelligenceBDE3Total (AU)137				21	-				10
BG4104 Machine Learning and Optimization for Bioengineers BG4122 Medical Device Design C 3 BG4801 Final Year Project C 4 BG4801 Final Year Project C 4 BE4483 Artificial Intelligence & Data Mining BC2406 Analytics I: Visual and Predictive Techniques BDE 4 BG4801 Final Year Project C 4 BIE PE 2 MPE 3 MH1403 Algorithms & Computing BDE 3 CB4246 Optimisation Using Artificial Intelligence BDE 3 CB4246 Optimisation Using Artificial Intelligence BDE 3 Total (AU) 137		emester 1	_				emester 2	_	
Bioengineers C 3 Bioengineers Bioengineers Bioengineers C 3 Bioengineers Bioengineers Bioengineers Bioengineers Bioengineers Bioengineers Bioengineers C 4 Bile PE 2 MPE 3 Bioengineers MPE 3 MH1403 Algorithms & Computing Bioengineers Bioengineers Bioengineers Bioengineers MPE 3 MH1403 Algorithms & Computing Bioengineers Bioengineers Bioengineers MPE 3 EE44791 Database Systems Bioengineers Bioengineers Bioengineers MPE 3 EE44791 Database Systems Bioengineers Bioengineers MPE 3 CB4246 Optimisation Using Artificial Intelligence Bioengineers Bioengineers Bioengineers MPE 3 CB4246 Optimisation Using Artificial Intelligence Bioengineers		Machine Learning and Ontimization for			-				
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EE4483 Artificial Intelligence & Data Mining BDE 3 BC2406 Analytics I: Visual and Predictive Techniques BDE 4 MH1403 Algorithms & Computing BDE 3 EE4791 Database Systems BDE 3 CB4246 Optimisation Using Artificial Intelligence BDE 3 Total (AU) 137	BG4122					BG4801			
BC2406 Analytics I: Visual and Predictive Techniques BDE 4 EE4791 Database Systems BDE 3 CB4246 Optimisation Using Artificial Intelligence BDE 3 Total (AU) 137				-		MH1403			
17 19 Total (AU) 137						EE4791	Database Systems	BDE	3
Total (AU) 137					_				
·				17					
							Total (AU)		137 138*

^{*}Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU). ^Counted towards 2nd Major in Data Analytics requirement (total 10AU)