Birla Institute of Technology & Science, Pilani
Pilani | Dubai | Goa | Hyderabad | Mumbai

DETAILS OF PROGRAMMES

Legend

AN	Aeronautics
BIO	Biological Sciences
BIOT	Biotechnology
CDP	Courses on Development Process
CE	Civil Engineering
CHE	Chemical
CHEM	Chemistry
CHI	Chinese
CS/Comp/Comp Sc	Computer Science
ECON	Economics
ECE	Electronics and Communication Engineering
EEE	Electrical & Electronics Engineering
EI	Electronics & Instrumentation
ES	Engineering Science
ET	Engineering Technology
Engg	Engineering: Chemical, Civil, Computer Science, Electrical & Electronics, Electronics & Instrumentation, Electronics and Communication, Manufacturing, Mechanical
ENGL	English
ExptlSc	Experimental Science: Biological Sciences, Chemistry, Physics
FIN	Finance
FRE	French
GER	German

HSS	Humanities and Social Sciences
IS	Information Systems
ITEB	Internet Technology and e-Business
JAP	Japanese
L	Lecture hours per week
MATH	Mathematics
MBA	Master of Business Administration
MECH	Mechanical
MF	Manufacturing Engineering
Min/Max	Indicates minimum/maximum number of units specified in a course or semester programme
MGTS	Management
MGSYS	Management Systems
MM	Manufacturing Management
MPH	Master in Public Health
MST	Material Science and Technology
P	Practical, Seminar & Project, etc. hours per week
PHIL	Philosophy
PHARM	Pharmacy
PHY	Physics
RUS	Russian
SAN	Sanitation Science, Technology and Management
SS	Software Systems
Sc.	Biological Sciences, Chemistry, Economics, Mathematics, Physics
T	Suffixed to a course number indicates that a non-letter grade will be awarded in such a course
TA	Technical Arts
TOC	Technique Oriented Courses
U	Number of units associated to a course

Course descriptions are available at: **https://academic.bits-pilani.ac.in/Institute_Important_Documents.aspx**

INTEGRATED FIRST DEGREE PROGRAMMES

(I) Structure of the Integrated First Degree Programmes

The structure and the requirements of the first degree programs ,namely, B.E.,B. Pharm., and M.Sc., are provided in the following sections.

The structure and the requirements of the first degree programs, namely, B.E., B. Pharm, M.Sc., and M.Sc.(Tech) are the same as provided in the following sections although the nomenclature of these programs is indicated without the Hons. / Tech. tag in the rest of the section**.**

The category-wise structure of each programme:

Category	**Number of Units Required**	**Number of Courses Required**
(I) General Institutional Requirement		
Humanities Electives	8	3
Science Foundation	12	6
Mathematics Foundation	12	4
Engineering Foundation	6	2
Technical Arts	10	4
General Awareness / Professional Courses	3 to 6	1 to 3
Sub-Total	**51 to 54**	**20 to 22**
(II) Discipline Requirement		
Core	33 to 48	10 to 16

Elective	12 to 27	4 to 9
Sub-Total	57 to 60	15 to 20
(III) Open Electives	15 to 27	5 to 9
Course-work Sub-Total	**129 (min)**	**41 (min)**
(IV) PS-I and II **OR** **Thesis**	25 OR 9 to 16	2 OR 1
Total	**144 (min)**	**42 (min)**

A student should complete the minimum number of courses and units required in each category as well as meet the minimum requirements of courses (42) and units (144) in total.

1. The following courses are needed to meet the General Institutional Requirement:

a) General Biology, Biology Laboratory, General Chemistry, Chemistry Laboratory, Mechanics, Oscillations and Waves, and Physics Laboratory under the head of Science Foundation. For specific programs, General Physics may replace Mechanics, Oscillations and Waves.

b) Electrical Sciences, Thermodynamics and Process Engineering under the head of Engineering Foundation.

c) Computer Programming, Workshop Practice, Engineering Graphics, and Technical Report Writing under the head of Technical Arts.

d) Principles of Economics, or Principles of Management and Environmental Studies* under the head of General Awareness / Professional courses. *[Students completing this course will be awarded a non-letter grade (GOOD or POOR)]

2. The courses under the following heads are designed to meet the General Institutional Requirement under the head of Humanities Electives:
    - Languages and Literature
    - History and Philosophy
    - Political and Social Sciences
    - Fine Arts and Professional Arts
3. A thesis is for 16 units and for a full semester duration. But a student has the option of pursuing a Thesis of 9 units concurrently with coursework over a full semester, in which case the additional coursework would be at least 2 courses of total 6 units to meet the minimum unit requirements.

The nominal semester-wise chart for first degree programs are given in the Pages 3-22.

Dual Degree Programs:

Students admitted to M.Sc. programmes are given an opportunity to work under the dual degree scheme for one of the B.E. programmes, the assignment being made by competition on their performance at BITS at the end of the first year, separately in Pilani, Goa and Hyderabad campuses. The Dual Degree scheme at BITS Pilani is quite popular. Based on the above, the curricular structure of a dual degree programmmes has been derived using the following principles.

- General Institute Requirements will remain the same for both the degrees of the composite dual-degree program and therefore need not be repeated.
- While the Discipline Requirements of each of the two degrees in a dual degree program have to be met separately, any course that meets the discipline requirements of both the degree programs need not be repeated.
- In addition the Discipline Elective courses of either of the two degrees

in a dual degree program may be used to fulfill the open elective requirement of the other degree.

- A PS-II or Thesis must be done to meet the requirements of each degree. Therefore to complete the dual degree program a student must complete one of the following:
  - 2 Practice School-II courses
  - 2 Thesis courses
  - 1 Practice School-II course and 1 Thesis course.

A thesis for 9 units with concurrent course work for at most 9 units over a full semester duration is also possible as an option.

Based on these principles, the semester-wise patterns for a composite dual degree program as options for the student are shown in pages 23-25. However, the charts mentioned on pages 26-65 are designed to enable the students to complete the composite dual degrees in their respective programmes in 10 semesters.

Semester-wise Pattern for Students Admitted to B.E. Biotechnology Programme								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F111	Thermodynamics	3
	BITS	F110	Engineering Graphics	2				
				17				**20**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
			Open/Humanities Electives	3(min)			or	or
	BIOT	F211	Biological Chemistry	3	MGTS	F211	Principles of Management	3
	BIOT	F212	Microbiology	4			Open/Humanities Electives	3(min)
	BIOT	F215	Biophysics	3	BIOT	F241	Genetic Engineering Techniques	4
	BIOT	F213	Cell Biology	3	BIOT	F243	Genetics	3
	BITS	F225	Environmental Studies	3	BIOT	F245	Introduction to Environmental Biotechnology	3
					BIOT	F244	Instrumental Methods of Analysis	4
				22				**20**
Summer	**BITS F221 Practice School – I (for PS Option Only)**							
III			Open/Humanities Electives	3to6			Open/Humanities Electives	3to6
	BIOT	F311	Recombinant DNA Technology	3	BIOT	F342	Immunology	3
					BIOT	F343	Experiments in Biotechnology	3
	BIOT	F314	Industrial Microbiology & Bioprocess Engineering	4	BIOT	F344	Downstream Processing	3
			Discipline Electives	8			Discipline Electives	6
				18/21				**18/21**
IV			Open Electives	5 to 11	BITS	F412	Practice School-II	20
			Discipline Electives	3			or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15to18
				8/14				**15/20**

Discipline Core -43 Units (13 Courses)

Discipline Electives-15 Units(5 Courses)

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to B.E. Chemical Programme									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F111	Thermodynamics	3
	BITS	F110	Engineering Graphics	2				
				17				**20**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
			Humanities Electives	3(min)			or	or
	CHE	F211	Chemical Process Calculations	3	MGTS	F211	Principles of Management Humanities Electives	3 3(min)
	CHE	F214	Engineering Chemistry	3	CHE	F241	Heat Transfer	3
	CHE	F213	Chemical Engineering Thermodynamics	3	CHE	F242	Numerical Methods for Chemical Engineers	3
	CHE	F212	Fluid Mechanics	3	CHE	F243	Material Science & Engineering	3
	BITS	F225	Environmental Studies	3	CHE	F244	Separation Processes I	3
				21 (min)				**18(min)**
Summer	**BITS F221 Practice School – I(for PS Option Only)**							
III			Open/Humanities Electives	3to6			Open/Humanities Electives	3to6
	CHE	F312	Chemical Engineering Laboratory I	3	CHE	F341	Chemical Engineering Laboratory II	3
	CHE	F313	Separation Processes II	3	CHE	F342	Process Dynamics &	3
	CHE	F311	Kinetics & Reactor Design	3			Control	
	CHE	F314	Process Design Principles I	3	CHE	F343	Process Design	
			Discipline Electives	3			Principles II	3
							Discipline Electives	6
				18/21				**18/21**
IV			Open Electives	5 to 11	BITS	F412	Practice School-II	20
			Discipline Electives	6			or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15 to 18
				11/17				**15/20**

Discipline Core -45 Units (15 Courses)

Discipline Electives-15 Units(5 Courses)

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to B.E. Civil Programme									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F111	Thermodynamics	3
	BITS	F110	Engineering Graphics	2				
				17				**20**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
			Humanities Electives	3 (min)			or	or
	CE	F211	Mechanics of Solids	3	MGTS	F211	Principles of Management	3
	CE	F231	Fluid Mechanics	3			Humanities Electives	3 (min)
	CE	F213	Surveying	4	CE	F241	Analysis of Structures	3
	CE	F230	Civil Engineering Materials	4	CE	F242	Construction Planning & Technology	3
					CE	F243	Soil Mechanics	4
					CE	F244	Highway Engineering	4
					BITS	F225	Environmental Studies	3
				20 (min)				**20(min)**
Summer	**BITS F221 Practice School – I (for PS Option Only)**							
III			Open/Humanities Electives	1 to 4			Open/Humanities	2 to 5
	CE	F320	Design of Reinforced Concrete Structures	3			Electives	
	CE	F312	Hydraulic Engineering	4	CE	F342	Water & Waste Water	4
	CE	F313	Foundation Engineering	3			Treatment	
			Discipline Electives	6	CE	F321	Engineering Hydrology	3
					CE	F343	Design of Steel Structures	3
							Discipline Electives	6
				17/20				**18/21**
IV			Open Electives	8to14	BITS	F412	Practice School-II	20
							or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15to18
				8/14				**15/20**

Discipline Core -48 Units (14 Courses)

Discipline Electives-12 Units(4 Courses)

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to B. E. Computer Science Programme								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F111	Thermodynamics	3
	BITS	F110	Engineering Graphics	2				
				17				**20**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
			Humanities Electives	3(min)			or	or
	CS	F214	Logic in Computer Science	3	MGTS	F211	Principles of Management	3
	CS	F222	Discrete Structures for Computer Science	3			Humanities Electives	3(min)
	CS	F213	Object Oriented Programming	4	CS	F211	Data Structures & Algorithms	4
	CS	F215	Digital Design	4	CS	F241	Microprocessors & Interfacing	4
					CS	F212	Database Systems	4
					BITS	F225	Environmental Studies	3
				20(min)				**21(min)**
Summer	**BITS F221 Practice School – I (for PS Option Only)**							
III			Open/Humanities Electives	3to6			Open/Humanities Electives	2to5
	CS	F351	Theory of Computation	3				
	CS	F372	Operating Systems	3	CS	F363	Compiler Construction	3
	CS	F301	Principles of Programming Languages	2	CS	F364	Design & Analysis of Algorithms	3
	CS	F342	Computer Architecture	4	CS	F303	Computer Networks	4
			Discipline Electives	3(min)			Discipline Electives	6(min)
				18/21				**18/21**
IV			Open Electives	6to12	BITS	F412	Practice School-II	20
			Discipline Electives	3(min)			or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15to18
				9/15				**15/20**

Discipline Core -48 Units (14 Courses)

Discipline Electives-12 Units(4 Courses)

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to B.E. Electrical & Electronics Programme									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F111	Thermodynamics	3
	BITS	F110	Engineering Graphics	2				
				17				**20**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
			Humanities Electives	3(min)			or	or
	EEE	F211	Electrical Machines	4	MGTS	F211	Principles of Management	3
	EEE	F212	Electromagnetic Theory	3			Humanities Electives	3(min)
	EEE	F215	Digital Design	4	EEE	F241	Microprocessors & Interfacin	4
	EEE	F214	Electronic Devices	3	EEE	F242	Control Systems	3
					EEE	F243	Signals & Systems	3
					EEE	F244	Microelectronic Circuits	3
					BITS	F225	Environmental Studies	3
				20(min)				**22(min)**
Summer	**BITS F221 Practice School – I (for PS Option Only)**							
III			Open/Humanities Electives	4to6			Open/Humanities Electives	3to6
	EEE	F311	Communication Systems	4	EEE	F341	Analog Electronics	4
	MATH	F212	Optimization	3	EEE	F342	Power Electronics	4
			or		EEE	F312	Power Systems	3
	ME	F344	Engineering Optimization	2			Discipline Electives	4(min)
	EEE	F313	Analog & Digital VLSI Design	3				
			Discipline Electives	5(min)				
				18/21				**18/21**
IV			Open Electives	5to11	BITS	F412	Practice School-II	20
			Discipline Electives	3(min)			or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15to18
				8/14				**15/20**

Discipline Core -47 or 48 Units (14 Courses)

Discipline Electives-12 Units (4 Courses)

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to B.E. Electronics & Communication Programme									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F111	Thermodynamics	3
	BITS	F110	Engineering Graphics	2				
				17				**20**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
			Humanities Electives	3(min)			or	or
	ECE	F211	Electrical Machines	4	MGTS	F211	Principles of Management	3
	ECE	F212	Electromagnetic Theory	3			Humanities Electives	3(min)
	ECE	F215	Digital Design	4	ECE	F241	Microprocessors and	
	ECE	F214	Electronic Devices	3			Interfacing	4
					ECE	F242	Control Systems	3
					ECE	F243	Signals & Systems	3
					ECE	F244	Microelectronic Circuits	3
					BITS	F225	Environmental Studies	3
				20(min)				**22(min)**
Summer				**BITS F221 Practice School – I (for PS Option Only)**				
III			Open/Humanities Electives	3 to 6			Open/Humanities Electives	3 to 6
	ECE	F311	Communication Systems	4	ECE	F341	Analog Electronics	4
	ECE	F314	Electromagnetic Fields &		ECE	F343	Communication Networks	3
			Microwave Engineering	3	ECE	F344	Information Theory &	
	ECE	F434	Digital Signal Processing	4			Coding	3
			Discipline Electives	4(min)			Discipline Electives	5(min)
				18/21				**18/21**
IV			Open Electives	5 to 11	BITS	F412	Practice School-II	20
			Discipline Electives	3			or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15 to 18
				8/14				**15/20**

Discipline Core-48 Units (14 Courses)

Discipline Electives-12 Units (4 Courses)

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to B.E. Electronics and Instrumentation Programme									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F111	Thermodynamics	3
	BITS	F110	Engineering Graphics	2				
				17				**20**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
			Humanities Electives	3(min)			or	or
	INSTR	F211	Electrical Machines	4	MGTS	F211	Principles of Management	3
	INSTR	F212	Electromagnetic Theory	3			Humanities Electives	3(min)
	INSTR	F215	Digital Design	4	INSTR	F241	Microprocessors & Interfacing	4
	INSTR	F214	Electronic Devices	3	INSTR	F242	Control Systems	3
					INSTR	F243	Signals & Systems	3
					INSTR	F244	Microelectronic Circuits	3
					BITS	F225	Environmental Studies	3
				20(min)				**22(min)**
Summer	**BITS F221 Practice School – I (for PS Option Only)**							
III			Open/Humanities Electives	3to6			Open/Humanities Electives	3to6
	INSTR	F311	Electronic Instruments & Instrumentation Technology	4	INSTR	F341	Analog Electronics	4
					INSTR	F342	Power Electronics	4
	INSTR	F312	Transducers & Measurement Systems	3	INSTR	F343	Industrial Instrumentation & Control	3
	INSTR	F313	Analog & Digital VLSI Design	3			Discipline Electives	4(min)
			Discipline Electives	5(min)				
				18/21				**18/21**
IV			Open Electives	5to11	BITS	F412	Practice School-II	20
			Discipline Electives	3			or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15to18
				8/14				**15/20**

Discipline Core- 48 Units (14 Courses)

Discipline Electives-12 Units (4 Courses)

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to B.E. Mechanical Programme								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BITS	F110	Engineering Graphics	2	BITS	F111	Thermodynamics	3
	BIO	F110	Biology Laboratory	1	BITS	F112	Technical Report Writing	2
	BIO	F111	General Biology	3	CS	F111	Computer Programming	4
	CHEM	F110	Chemistry Laboratory	1	EEE	F111	Electrical Sciences	3
	CHEM	F111	General Chemistry	3	MATH	F112	Mathematics II	3
	MATH	F111	Mathematics I	3	MATH	F113	Probability and Statistics	3
	PHY	F110	Physics Laboratory	1	ME	F112	Workshop Practice	2
	PHY	F111	Mechanics, Oscillations and Waves	3				
				17				**20**
II	MATH	F211	Mathematics III	3	BITS	F225	Environmental Studies	3
	ME	F211	Mechanics of Solids	3	ECON	F211	Principles of Economics	3
	ME	F212	Fluid Mechanics	3			or	or
	ME	F216	Materials Science & Engineering	3	MGTS	F211	Principles of Management	3
	ME	F217	Applied Thermodynamics	4	ME	F218	Advanced Mechanics of Solids	2
			Humanities Electives	3(min)	ME	F219	Manufacturing Processes	4
					ME	F220	Heat Transfer	4
					ME	F221	Mechanisms and Machines	3
							Humanities Electives	3(min)
				19(min)				**22(min)**
Summer	**BITS F221 Practice School – I (for PS Option Only)**							
III			Open/Humanities Electives	1 to 4			Open/Humanities Electives	3 to 6
	ME	F314	Design of Machine Elements	3	ME	F318	Computer-Aided Design	3
	ME	F315	Advanced Manufacturing Processes	3	ME	F319	Vibrations & Control	3
	ME	F316	Manufacturing Management	2	ME	F320	Engineering Optimization	3
	ME	F317	Engines, Motors, and Mobility	2	ME	F341	Prime Movers & Fluid Machines	3
			Discipline Electives	6(min)			Discipline Electives	3(min)
				17/20				**18/21**
IV			Open Electives	7to13	BITS	F412	Practice School-II	20
			Discipline Electives	3(min)			or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15 to 18
				10/16				**15/20**

Discipline Core - 48 Units (16 Courses)

Discipline Electives - 12 Units (4 Courses)

Note: This is an operative pattern for the students who are admitted from August 2019 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to B.E. Manufacturing Programme								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BITS	F110	Engineering Graphics	2	BITS	F111	Thermodynamics	3
	BIO	F110	Biology Laboratory	1	BITS	F112	Technical Report Writing	2
	BIO	F111	General Biology	3	CS	F111	Computer Programming	4
	CHEM	F110	Chemistry Laboratory	1	EEE	F111	Electrical Sciences	3
	CHEM	F111	General Chemistry	3	MATH	F112	Mathematics II	3
	MATH	F111	Mathematics I	3	MATH	F113	Probability and Statistics	3
	PHY	F110	Physics Laboratory	1	ME	F112	Workshop Practice	2
	PHY	F111	Mechanics, Oscillations and Waves	3				
				17				**20**
II	MATH	F211	Mathematics III	3	BITS	F225	Environmental Studies	3
	MF	F211	Mechanics of Solids	3	ECON	F211	Principles of Economics	3
	MF	F216	Materials Science & Engineering	3			or	or
	MF	F217	Machine Drawing	2	MGTS	F211	Principles of Management	3
	MF	F218	Transport Phenomena in Manufacturing	4	MF	F219	Operations Management	3
			Humanities Electives	3(min)	MF	F220	Metrology and Quality Assurance	3
					MF	F221	Mechanisms and Machines	3
					MF	F222	Casting, Forming and Welding	4
							Humanities Electives	3(min)
				18(min)				**22(min)**
Summer	**BITS F221 Practice School – I (for PS Option Only)**							
III			Open/Humanities Electives	2 to 5			Open/Humanities Electives	2 to 5
	MF	F314	Design of Machine Elements	3	MF	F317	Computer Aided Design and Manufacturing	3
	MF	F315	Automation and Control	4	MF	F318	Non Traditional Manufacturing Processes	3
	MF	F316	Machining and Machine Tools	4	MF	F319	Supply Chain Management	3
			Discipline Electives	6(min)	MF	F320	Engineering Optimization	3
							Discipline Electives	3(min)
				19/22				**17/20**
IV			Open Electives	7 to 13	BITS	F412	Practice School-II	20
			Discipline Electives	3(min)			or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15 to18
				10/16				**15/20**

Discipline Core - 48 Units (15 Courses)
Discipline Electives - 12 Units (4 Courses)

Note: This is an operative pattern for the students who are admitted from August 2019 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to B.E. Mathematics and Computing Programme				
Year	**First Semester**	**Units**	**Second Semester**	**Units**
	MATH F111 Mathematics I	3	MATH F112 Mathematics II	3
	BIO F110 Biology Laboratory	1	ME F112 Workshop Practice	2
	BIO F111 General Biology	3		
	CHEM F110 Chemistry Laboratory	1	CS F111 Computer Programming	4
	CHEM F111 General Chemistry	3	EEE F111 Electrical Sciences	3
	PHY F110 Physics Laboratory	1		
	PHY F111 Mechanics, Oscillations, and Waves	3	BITS F112 Technical Report Writing	2
			MATH F113 Probability and Statistics	3
	BITS F110 Engineering Graphics	2	BITS F111 Thermodynamics	3
		17		**20**
	First Semester	**U**	**Second Semester**	**U**
II	MATH F211 Mathematics III	3	MAC F241 Numerical Analysis	3
	MAC F211 Linear Algebra and Applications	3	MAC F242 Data Structures & Algorithms	4
	MAC F212 Object Oriented Programming	4	MAC F243 Numerical Optimization	3
	MAC F213 Discrete Mathematics	3	MAC F244 Stochastic Calculus and Application to Finance	3
	MAC F214 Elementary Real Analysis	3		
	Humanities Elective	3	MAC F245 Scientific Computing Laboratory	1
	BITS F225 Environmental Studies	3	MGTS F211 Principles of Management (or) ECON F211 Principles of Economics	3
		22		**17**
Summer	**BITS F221 Practice School -1**			
	First Semester	**U**	**Second Semester**	**U**
III	MAC F311 Algebra I	3	MAC F341 Design and Analysis of Algorithms	3
	MAC F312 Foundations of Data Science	3	MAC F342 Computational Partial Differential Equations	4
	MAC F313 Statistical Data Analysis	4		
	MAC F314 Mathematical Modelling	4		6
	Humanities Elective	3	Discipline Elective	2
	Discipline Elective	3	Humanities Elective	3
			Open Elective	
		20		**18**
	First Semester	**U**	**Second Semester**	**U**
IV	Open Electives	12	BITS Practice School-II	20
			or	or
	Discipline Elective	3	BITS F421T Thesis	16
			or	or
			Thesis (9) and Electives (6 to 9)	15 to 18
		15		**15/20**

Discipline core – **48** Units (**15** Courses), Discipline elective – **12** Units (4 Courses)

Semester-wise Pattern for Students Admitted to B. Pharm.Programme								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F111	Thermodynamics	3
	BITS	F110	Engineering Graphics	2				
				17				**20**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
			Humanities Electives	3(min)			or	or
	PHA	F211	Pharmaceutical Analysis	3	MGTS	F211	Principles of Management	3
	PHA	F214	Anatomy, Physiology & Hygiene	3			Humanities Electives	3(min)
	PHA	F216	Pharmaceutical Formulations I	3	PHA	F241	Pharmaceutical Chemistry	3
	PHA	F217	Pharmaceutical Microbiology	3	PHA	F242	Biological Chemistry	3
	BITS	F225	Environmental Studies	3	PHA	F243	Industrial Pharmacy	3
					PHA	F244	Physical Pharmacy	3
				21(min)				**18(min)**
Summer	**BITS F221 Practice School – I (for PS Option Only)**							
III			Open/Humanities Electives	2 to 5			Open/Humanities Electives	4 to 6
	PHA	F311	Pharmacology I	3	PHA	F341	Pharmacology II	3
	PHA	F312	Medicinal Chemistry I	3	PHA	F342	Medicinal Chemistry II	3
	PHA	F313	Instrumental Methods of Analysis	4	PHA	F343	Forensic Pharmacy	2
	PHA	F315	Pharmaceutical Formulations II	3	PHA	F344	Natural Drugs	3
			Discipline Electives	3(min)			Discipline Electives	3(min)
				18/21				**18/20**
IV			Open Electives	6 to 11	BITS	F412	Practice School-II	20
			Discipline Electives	6(min)			or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15 to 18
				12/17				**15/20**

Discipline Core - 48 Units (16 Courses); Discipline Electives-12 Units(4 Courses)

Note: This is operative pattern for the students who are admitted during 2011-2013 as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to B. Pharm. Programme						
Year	**First Semester**		**U**	**Second Semester**		**U**
I	BIO F110	Biology Laboratory	1	BITS F114	General Mathematics II*	3
	BIO F111	General Biology	3	OR		
	CHEM F110	Chemistry Laboratory	1	MATH F112	Mathematics II	
	CHEM F111	General Chemistry	3	ME F112	Workshop Practice	2
	BITS F113	General Mathematics I*	3	CS F111	Computer Programming	4
	OR			PHA F214	Anatomy, Physiology, &	3
	MATH F111	Mathematics I			Hygiene	
	PHY F110	Physics Laboratory	1	PHA F216	Pharmaceutical Formulations I	3
	PHY F112	General Physics	3	BITS F112	Technical Report Writing	2
	OR			MGTS F211	Principles of Management	
	PHY F111	Mechanics, Oscillations and Waves		OR		3
				ECON F211	Principles of Economics	
	BITS F110	Engineering Graphics	2			
			17			**20**
II	Humanities Electives		3	Humanities Electives		3
	BITS F218	General Mathematics III*	3	BITS F111	Thermodynamics	3
	OR			PHA F241	Pharmaceutical Chemistry	3
	MATH F211	Mathematics III		MATH F113	Probability and Statistics	3
	PHA F211	Pharmaceutical Analysis	3	PHA F215	Introduction to Molecular	
	BITS F219	Process Engineering	3		Biology and Immunology	3
	PHA F242	Biological Chemistry	3	PHA F244	Physical Pharmacy	3
	PHA F217	Pharmaceutical Microbiology	3			
	BITS F225	Environmental Studies	3			
			21			**18**
Summer BITS F221 Practice School I (5 Units) Only for PS Option						
III	Open/Humanities Electives		2 to 5	Open/Humanities electives		4 to 6
	PHA F311	Pharmacology I	3	PHA F341	Pharmacology II	3
	PHA F312	Medicinal Chemistry I	3	PHA F342	Medicinal Chemistry II	3
	PHA F313	Instrumental Methods of Analysis	4	PHA F343	Forensic Pharmacy	2
				PHA F344	Natural Drugs	3
	PHA F315	Pharmaceutical Formulations II	3	Discipline Electives		3(min)
	Discipline Electives		3 (min)			
			18 /21			**18 /20**
IV	Open electives		6to11	BITS F412 Practice School II		20
	Discipline Electives		6 (min)	OR		
				BITS F421T Thesis (16) or Thesis (9) and Electives (6 to 9)		16 or 15 to 18
			12/17			**15/20**

Discipline Core -48 Units (16 Courses)

Discipline Electives- 12 Units (4 Courses)

* A student must pursue all three courses in one sequence only (i.e. either Mathematics I, Mathematics II, and Mathematics III, or General Mathematics, General Mathematics II, and General Mathematics III).

Note: This is operative pattern for the students who are admitted from August 2014 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to M.Sc. Biological Sciences Programme									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F111	Thermodynamics	3
	BITS	F110	Engineering Graphics	2				
				17				**20**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
			Humanities Electives	3(min)			or	or
	BIO	F211	Biological Chemistry	3	MGTS	F211	Principles of Management	3
	BIO	F213	Cell Biology	3			Humanities Electives	3(min)
	BIO	F212	Microbiology	4	BIO	F241	Ecology & Environmental	
	BIO	F214	Integrated Biology	3			Science	3
	BITS	F225	Environmental Studies	3	BIO	F242	Introduction to Bioinformatics	3
					BIO	F243	Genetics	3
					BIO	F244	Instrumental Methods of Analysis	4
				22(min)				**19(min)**
Summer	**BITS F221 Practice School – I (for PS Option Only)**							
III			Open/Humanities Electives	3 to 6			Open/Humanities Electives	0 to 3
	BIO	F311	Recombinant DNA Technology	3	BIO	F341	Developmental Biology	3
					BIO	F342	Immunology	3
	BIO	F312	Plant Physiology	3	BIO	F215	Biophysics	3
	BIO	F313	Animal Physiology	3			Discipline Electives	9(min)
			Discipline Electives	6(min)				
				18/21				**18/21**
IV			Open Electives	8 to14	BITS	F412	Practice School-II	20
							or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15 to18
				8/14				**15/20**

*****Discipline Core - 44 Units (14 Courses)

*Discipline Electives - 15 Units (min)-(4 Courses (min))

Note: *This is operative pattern for the students who are admitted from August 2013 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to M.Sc. Chemistry Programme									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F111	Thermodynamics	3
	BITS	F110	Engineering Graphics	2				
				17				**20**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
			Humanities Electives	3(min)			or	or
	CHEM	F211	Physical Chemistry I	3	MGTS	F211	Principles of Management	3
	CHEM	F212	Organic Chemistry I	3			Humanities Electives	3(min)
	CHEM	F213	Physical Chemistry II	3	CHEM	F241	Inorganic Chemistry II	
	PHY	F212	Electromagnetic Theory I	3	CHEM	F242	Chemical Experimentation I	3
	CHEM	F214	Inorganic Chemistry I	3	CHEM	F243	Organic Chemistry II	3
					CHEM	F244	Physical Chemistry III	3
					BITS	F225	Environmental Studies	3
				21(min)				**21(min)**
Summer	**BITS F221 Practice School – I (for PS Option Only)**							
III			Open/Humanities Electives	2 to 5			Open/Humanities Electives	2 to 5
	CHEM	F313	Instrumental Methods of Analysis	4	CHEM	F341	Chemical Experimentation II	4
					CHEM	F342	Organic Chemistry IV	3
	CHEM	F311	Organic Chemistry III	3	CHEM	F343	Inorganic Chemistry III	3
	CHEM	F312	Physical Chemistry IV	3			Discipline Electives	6(min)
			Discipline Electives	6(min)				
				18/21				**18/21**
IV			Open Electives	7 to13	BITS	F412	Practice School-II	20
							or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15 to18
				7/13				**15/20**

Discipline Core-47 Units (15 Courses)

Discipline Electives-12 Units(4 Courses)

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to M. Sc. Economics Programme									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F111	Thermodynamics	3
	BITS	F110	Engineering Graphics	2				
				17				**20**
II	MATH	F211	Mathematics III	3	MGTS	F211	Principles of Management	3
			Humanities Electives	3(min)			Humanities Electives	3(min)
	ECON	F211	Principles of Economics	3	ECON	F241	Econometric Methods	3
	ECON	F212	Fundamentals of Finance &		ECON	F242	Microeconomics	3
			Accounts	3	ECON	F243	Macroeconomics	3
	ECON	F213	Mathematical & Statistical		ECON	F244	Economics of Growth &	
			Methods	3			Development	3
	ECON	F214	Economic Environment of Business	3				
	BITS	F225	Environmental Studies	3				
				21(min)				**18(min)**
Summer	**BITS F221 Practice School – I (for PS Option Only)**							
III			Open/Humanities Electives	3 to 6			Open/Humanities Electives	3 to 6
	ECON	F311	International Economics	3	ECON	F341	Public Finance Theory &	
	ECON	F312	Money Banking & Financial	3			Policy	3
			Markets		ECON	F342	Applied Econometrics	3
	ECON	F313	Issues in Economic Development	3	ECON	F343	Economic Analysis of Public Policy	3
			Discipline Electives	6(min)			Discipline Electives	6(min)
				18/21				**18/21**
IV			Open Electives	5 to 11	BITS	F412	Practice School-II	20
			Discipline Electives	6			or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15to18
				11/17				**15/20**

Discipline Core -42 Units (14 Courses)

Discipline Electives -18 Units(6 Courses)

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to M.Sc. Mathematics Programme									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F111	Thermodynamics	3
	BITS	F110	Engineering Graphics	2				
				17				**20**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
			Humanities Electives	3(min)			or	or
	MATH	F212	Optimization	3	MGTS	F211	Principles of Management	3
	MATH	F213	Discrete Mathematics	3			Humanities Electives	3(min)
	MATH	F214	Elementary Real Analysis	3	MATH	F241	Mathematical Methods	3
	MATH	F215	Algebra I	3	MATH	F242	Operations Research	3
	BITS	F225	Environmental Studies	3	MATH	F243	Graphs & Networks	3
					MATH	F244	Measure & Integration	3
				21(min)				**18(min)**
Summer	**BITS F221 Practice School – I (for PS Option Only)**							
III			Open/Humanities Electives	3 to 6			Open/Humanities	
	MATH	F311	Introduction to Topology	3			Electives	0 to 3
	MATH	F312	Ordinary Differential		MATH	F341	Introduction to Functional	
			Equations	3			Analysis	3
	MATH	F313	Numerical Analysis	3	MATH	F342	Differential Geometry	3
			Discipline Electives	6	MATH	F343	Partial Differential Equations	3
							Discipline Electives	9
				18/21				**18/21**
IV			Open Electives	8 to14	BITS	F412	Practice School-II	20
							or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15 to18
				8/14				**15/20**

Discipline Core -42 Units (14 Courses)

Discipline Electives -15 Units (5 Courses)

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to M. Sc. Physics Programme									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F111	Thermodynamics	3
	BITS	F110	Engineering Graphics	2				
				17				**20**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
			Humanities Electives	3(min)			or	or
	PHY	F211	Classical Mechanics	4	MGTS	F211	Principles of Management	3
	PHY	F212	Electromagnetic Theory I	3			Humanities Electives	3(min)
	PHY	F213	Optics	3	PHY	F241	Electromagnetic Theory II	4
	PHY	F214	Electricity, Magnetism & Optics Laboratory	2	PHY	F242	Quantum Mechanics I	3
					PHY	F243	Mathematical Methods of Physics	3
	BITS	F225	Environmental Studies	3	PHY	F244	Modern Physics Laboratory	2
				21(min)				**18(min)**
Summer	**BITS F221 Practice School – I (for PS Option Only)**							
III			Open/Humanities Electives	3 to 6			Open/Humanities Electives	3 to 6
	PHY	F311	Quantum Mechanics II	3	PHY	F341	Solid State Physics	3
	PHY	F312	Statistical Mechanics	3	PHY	F342	Atomic & Molecular Physics	3
	PHY	F313	Computational Physics	3	PHY	F343	Nuclear & Particle Physics	3
			Discipline Electives	6(min)	PHY	F344	Advanced Physics Laboratory	3
							Discipline Electives	3(min)
				18/21				**18/21**
IV			Open Electives	5 to 11	BITS	F412	Practice School-II	20
			Discipline Electives	6(min)			or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15 to 18
				11/17				**15/20**

*****Discipline Core - 45 Units (15 Courses)

*Discipline Electives - 15 Units (min)-4 Courses(min)

Note: *This is operative pattern for the students who are admitted from August 2014 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to M.Sc. General Studies – Communication and Media Studies Stream								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F111	Thermodynamics	3
	BITS	F110	Engineering Graphics	2				
				17				**20**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
			Humanities Electives	3(min)			or	or
	GS	F221	Business Communication	3	MGTS	F211	Principles of Management	3
	GS	F222	Language Lab Practice	3			Humanities Electives	3(min)
	GS	F223	Introduction to Mass Communication	3	GS	F244	Reporting & Writing for Media	3
	GS	F224	Print & Audio Visual Advertising	3	GS	F241	Creative Writing	3
					GS	F245	Effective Public Speaking	3
	BITS	F225	Environmental Studies	3	GS	F243	Current Affairs	3
				21(min)				**18(min)**
Summer	**BITS F221 Practice School – I (for PS Option Only)**							
III			Open/Humanities Electives	3 to 6			Open/Humanities Electives	3 to 6
	GS	F321	Mass Media Content & Design	3	GS	F342	Computer Mediated Communication	3
	GS	F322	Critical Analysis of Literature & Cinema	3	GS	F343	Short Film & Video Production	3
			Discipline Electives	9(min)			Discipline Electives	9(min)
				18/21				**18/21**
IV			Open Electives	5 to 11	BITS	F412	Practice School-II	20
			Discipline Electives	3(min)			or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15 to18
				8/14				**15/20**

Discipline Core - 36 Units (12 Courses)

Discipline Electives - 21 Units(7 Courses)

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise Pattern for Students Admitted to M.Sc. General Studies – Development Studies Stream								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F111	Thermodynamics	3
	BITS	F110	Engineering Graphics	2				
				17				**20**
II	MATH	F211	Mathematics III	3	MGTS	F211	Principles of Management	3
			Humanities Electives	3(min)			Humanities Electives	3(min)
	GS	F211	Modern Political Concepts	3	GS	F231	Dynamics of Social Change	3
	GS	F212	Environment, Development & Climate Change	3	GS	F232	Introductory Psychology	3
	GS	F213	Development Theories	3	GS	F233	Public Policy	3
	ECON	F211	Principles of Economics	3	GS	F234	Development Economics	3
	BITS	F225	Environmental Studies	3				
				21(min)				18(min)
Summer	**BITS F221 Practice School – I (for PS Option Only)**							
III			Open/Humanities Electives	3 to 6			Open/Humanities Electives	0 to 3
	GS	F311	Introduction to Conflict Management	3	GS	F331	Techniques in Social Research	3
	GS	F312	Applied Philosophy	3	GS	F332	Contemporary India	3
			Discipline Electives	9(min)	GS	F333	Public Administration	3
					GS	F334	Global Business Technology & Knowledge Sharing	3
							Discipline Electives	6(min)
				18/21				**18/21**
IV			Open Electives	8 to 14	BITS	F412	Practice School-II	20
							or	or
					BITS	F421T	Thesis	16
							or	
							Thesis (9) and Electives (6 to 9)	15 to 18
				8/14				**15/20**

Discipline Core - 42 Units (14 Courses)

Discipline Electives - 15 Units (5 Courses)

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Pattern 1 Semester-wise Pattern for Composite Dual Degree Programmes (Option A: Duration 10 Sem.)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations		BITS	F111	Thermodynamics	3
	BITS	F110	and Waves	3				
			Engineering Graphics	2				
				17				**20**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
			First Discipline Core				or	
			Courses	13 to 17	MGTS	F211	Principles of Management	
			Electives	3 to 6			First Discipline Core	
							Courses	13 to 17
							Electives	3 to 6
				23/24				**23/24**
Summer	**BITS F221 Practice School – I(for PS Option Only)**							
III			Second Discipline Core				Second Discipline Core	
			courses	12 to 16			Courses	12 to 16
			First Discipline Courses-Core/Elective	7 to 11			First Discipline Courses – Core / Elective	7 to 11
				23/24				**23/24**
IV			First Discipline Elective Courses	3 to 10			First Discipline Elective Courses	3to10
			Second Discipline Courses – Core + Elective	14 to 18			Second Discipline Courses - Core + Elective	14 to 18
							Electives (0 to 6)	0 to 6
				23/24				**23/24**
V			Electives	5 to 9	BITS	F412	Practice School-II	20
	BITS	F423T	Thesis	9			or	or
					BITS	F421T	Thesis	16

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Pattern 2	**Semester-wise Pattern for Composite Dual Degree Programmes (Option B: Duration 10 Sem. and a Summer Term)**							
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	CS	F111	Computer Programming	4
	CHEM	F111	General Chemistry	3	EEE	F111	Electrical Sciences	3
	MATH	F111	Mathematics I	3	BITS	F112	Technical Report Writing	2
	PHY	F110	Physics Laboratory	1	MATH	F113	Probability and Statistics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F111	Thermodynamics	4
	BITS	F110	Engineering Graphics(2)	2				
				17				**20**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	
							or	
			First Discipline Core Courses	13 to 17	MGTS	F211	Principles of Management	3
			Electives	3 to 6			First Discipline Core Courses	13 to 17
							Electives	3 to 6
				23/24				**23/24**
Summer	**BITS F221 Practice School – I(for PS Option Only)**							
III			Second Discipline Core Courses	12 to 16			Second Discipline Core Courses	12 to 16
			First Discipline Courses - Core / Elective	7 to 11			First Discipline Courses - Core / Elective	7 to 11
				23/24				**23/24**
IV			First Discipline Elective Courses	3/10			First Discipline Elective Courses	3 to 10
			Second Discipline Courses – Core + Elective	14 to 18			Second Discipline Courses - Core + Elective	14 to 18
			Electives	0 to 6			Electives	0 to 6
				23/24				**23/24**
Summer			Electives	5/9				
V	BITS	F412	Practice School - II	20	BITS	F413	Practice School - II	20
			or	or			or	or
	BITS	F421T	Thesis	16	BITS	F422	Thesis	16

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Pattern 3 Semesterwise Pattern for Dual Degree (Duration 11 Sem.)							
Year	**First Semester**		**U**	**Second Semester**			**U**
I	BIO F110	Biology laboratory	1	MATH F112	Mathematics II		3
	BIO F111	General Biology	3	ME F112	Workshop Practice		2
	CHEMF110	Chemistry Laboratory	1	CS F111	Computer Programming		4
	CHEM F111	General Chemistry	3	EEE F111	Electrical Sciences		3
	MATH F111	Mathematics I	3	BITS F112	Technical Report Writing		2
	PHY F110	Physics Laboratory	1	MATH F113	Probability and Statistics		3
	PHY F111	Mechanics, Oscillations and Waves	3	BITS F111	Thermodynamics		3
	BITS F110	Engineering Graphics	2				
			17				**20**
II	MATH F211	Mathematics III	3	ECON F211	Principles of Economics		13
		First Discipline Core Courses	13 to 17		or		
				MGTS F211	Principles of Management		
		Electives	3 to 6		First Discipline Core Courses		13 to 17
					Electives		3 to 6
			21/22				**21/22**
Summer		**BITS F221 Practice School – I (for PS Option Only)**					
III		Second Discipline Core courses	12 to 16		Second Discipline Core		
		First Discipline Courses -			Courses		12 to 16
		Core/Elective	7 to 10		First Discipline Courses – Core / Elective		7to11
			21/22				**21/22**
IV		First Discipline Elective Courses	3 to 10		First Discipline Elective Courses		3 to10
		Second Discipline Courses – Core+Elective	14 to 18		Second Discipline Courses - Core + Elective		14 to 18
		Electives	0 to 6		Electives		0 to 6
			21/22				**21/22**
V		Electives	17 to 23	BITS F412	Practice School-II		20
					or		or
				BITS F421T	Thesis		16
VI	BITS F413	Practice School-II	20				
		or	or				
	BITS F422T	Thesis	16				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes
(M.Sc. Biological Sciences with B.E. Chemical)

Year	First Semester			U	Second Semester			U
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics/ Principles of Management	3
	BIO	F211	Biological Chemistry	3				
	BIO	F213	Cell Biology	3	BIO	F241	Ecology & Environmental Science	3
	BIO	F212	Microbiology	4				
	BIO	F214	Integrated Biology	3	BIO	F242	Introduction to Bioinformatics	3
			Humanities Elective	3				
	BITS	F225	Environmental Studies	3	BIO	F243	Genetics	3
					BIO	F244	Instrumental Methods of Analysis	4
							Humanities Electives	5
				22				**21**
Summer	**BITS F221 Practice School -1 (for PS Option Only) (5 Units)**							
III	**First Semester**			**U**	**Second Semester**			**U**
	BIO	F311	Recombinant DNA Technology	3	BIO	F341	Developmental Biology	3
					BIO	F342	Immunology	3
	BIO	F312	Plant Physiology	3	BIO	F215	Biophysics	3
	BIO	F313	Animal Physiology	3	CHE	F241	Heat Transfer	3
	CHE	F211	Chemical Process Calculations	3	CHE	F242	Numerical Methods for Chemical Engineers	3
	CHE	F212	Fluid Mechanics	3	CHE	F243	Material Science & Engineering	3
	CHE	F214	Engineering Chemistry	3				
	CHE	F213	Chemical Engineering Thermodynamics	3	CHE	F244	Separation Processes I	3
				21				**21**
IV	**First Semester**			**U**	**Second Semester**			**U**
	CHE	F311	Kinetics & Reactor Design	3	CHE	F341	Chemical Engineering Laboratory II	3
	CHE	F312	Chemical Engineering Laboratory I	3	CHE	F342	Process Dynamics & Control	3
					CHE	F343	Process Design Principles II	3
	CHE	F313	Separation Processes II	3			First Discipline Electives	9
	CHE	F314	Process Design Principles I	3			Second Discipline Electives	6
			First Discipline Electives	6				
			Second Discipline Electives	3				
				21				**24**
V	**First Semester**			**U**	**Second Semester**			**U**
	Second Discipline Electives			6	BITS F412		Practice School - Ii	20
	BITS F423T		Thesis	9				
				15				**20**

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Biological Sciences with B.E. Civil)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	Same as First degree Programme				Same as First degree Programme			
II	**First Semester**			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	
	BIO	F211	Biological Chemistry	3			or	
	BIO	F213	Cell Biology	3	MGTS	F211	Principles of Management	3
	BIO	F212	Microbiology	4	BIO	F241	Ecology & Environmental Science	3
	BIO	F214	Integrated Biology	3	BIO	F242	Introduction to Bioinformatics	3
			Humanities Elective	3	BIO	F243	Genetics	3
	BITS	F225	Environmental Studies	3	BIO	F244	Instrumental Methods of Analysis	4
							Humanities Electives	5
				22				**21**
Summer	**BITS F221 Practice School -1 (for PS Option Only) (5 Units)**							
III	**First Semester**			**U**	**Second Semester**			**U**
	BIO	F311	Recombinant DNA Technology	3	BIO	F341	Developmental Biology	3
	BIO	F312	Plant Physiology	3	BIO	F342	Immunology	3
	BIO	F313	Animal Physiology	3	BIO	F215	Biophysics	3
	CE	F211	Mechanics of Solids	3	CE	F241	Analysis of structures	3
	CE	F231	Fluid Mechanics	3	CE	F242	Construction Planning & Technology	3
	CE	F230	Civil Engineering Materials	4	CE	F243	Soil Mechanics	4
	CE	F213	Surveying	4	CE	F244	Highway Engineering	4
				23				**23**
IV	**First Semester**			**U**	**Second Semester**			**U**
	CE	F320	Design of Reinforced Concrete Structures	3	CE	F342	Water & Waste Water Treatment	4
	CE	F312	Hydraulic Engineering	4	CE	F321	Engineering Hydrology	**3**
	CE	F313	Foundation Engineering	3	CE	F343	Design of Steel Structures	3
			First Discipline Electives	6			First Discipline Electives	9
			Second Discipline Electives	6			Second Discipline Electives	3
				22				**22**
V	**First Semester**			**U**	**Second Semester**			**U**
	Second Discipline Electives			3	BITS F412 Practice School - II			20
	BITS F423T		Thesis	9				

Note: This is operative pattern for the students who are admitted from **August 2017** onwards.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Biological Sciences with B.E. Computer Science)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	Same as First degree Programme				Same as First degree Programme			
II	**First Semester**			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	
	BIO	F211	Biological Chemistry	3			or	
	BIO	F213	Cell Biology	3	MGTS	F211	Principles of Management	3
	BIO	F212	Microbiology	4	BIO	F241	Ecology & Environmental Science	3
	BIO	F214	Integrated Biology	3	BIO	F242	Introduction to Bioinformatics	3
					BIO	F243	Genetics	3
			Humanities Elective	3	BIO	F244	Instrumental Methods of Analysis	4
	BITS	F225	Environmental Studies	3			Humanities Electives	5
				22				**21**
Summer	**BITS F221 Practice School -1 (for PS Option Only) (5 Units)**							
III	**First Semester**			**U**	**Second Semester**			**U**
	BIO	F311	Recombinant DNA Technology	3	BIO	F341	Developmental Biology	3
	BIO	F312	Plant Physiology	3	BIO	F342	Immunology	3
	BIO	F313	Animal Physiology	3	BIO	F215	Biophysics	3
	CS	F215	Digital Design	4	CS	F241	Microprocessors & Interfacing	4
	CS	F214	Logic in Computer Science	3	CS	F212	Database Systems	4
	CS	F222	Discrete Structures for Computer Science	3	CS	F211	Data Structures & Algorithms	4
	CS	F213	Object Oriented Programming	4				
				23				**21**
IV	**First Semester**			**U**	**Second Semester**			**U**
	CS	F351	Theory of Computation	3	CS	F363	Compiler Construction	3
	CS	F372	Operating Systems	3	CS	F364	Design and Analysis of Algorithms	3
	CS	F342	Computer Architecture	4	CS	F303	Computer Networks	4
	CS	F301	Principles of Programming Languages	2			First Discipline Elective	9
			First Discipline Electives	6			Second Discipline Electives	3
			Second Discipline Electives	3				
				21				**22**
V	**First Semester**			**U**	**Second Semester**			**U**
	Second Discipline Electives			6	BITS F412		Practice School - II	20
	BITS F423T		Thesis	9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Biological Sciences with B.E. Electrical & Electronics)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	Same as First degree Programme				Same as First degree Programme			
II	**First Semester**			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	BIO	F211	Biological Chemistry	3			or	
	BIO	F213	Cell Biology	3	MGTS	F211	Principles of Management	3
	BIO	F212	Microbiology	4	BIO	F241	Ecology & Environmental Science	3
	BIO	F214	Integrated Biology	3	BIO	F242	Introduction to Bioinformatics	3
			Humanities Elective	3	BIO	F243	Genetics	3
	BITS	F225	Environmental Studies	3	BIO	F244	Instrumental Methods of Analysis	4
							Humanities Electives	`5
				22				**21**
Summer	**BITS F221 Practice School -1 (for PS Option Only) (5 Units)**							
III	**First Semester**			**U**	**Second Semester**			**U**
	BIO	F311	Recombinant DNA Technology	3	BIO	F341	Developmental Biology	3
	BIO	F312	Plant Physiology	3	BIO	F342	Immunology	3
	BIO	F313	Animal Physiology	3	BIO	F215	Biophysics	3
	EEE	F212	Electromagnetic Theory	3	EEE	F243	Signals and Systems	3
	EEE	F211	Electrical Machines	4	EEE	F244	Microelectronic Circuits	3
	EEE	F214	Electronic Devices	3	EEE	F241	Microprocessors & Interfacing	4
	EE	F215	Digital Design	4	EEE	F242	Control Systems	3
				23				**22**
IV	**First Semester**			**U**	**Second Semester**			**U**
	EEE	F311	Communication Systems	4	EEE	F341	Analog Electronics	4
	MATH	F212	Optimization	3	EEE	F342	Power Electronics	4
			or	or	EEE	F312	Power Systems	3
	ME	F344	Engineering Optimization	2			First Discipline Electives	6
	EEE	F313	Analog & Digital VLSI Design	3			Second Discipline Elective	4
			First Discipline Electives	3				
			Second Discipline Electives	8				
				20/21				**21**
V	**First Semester**			**U**	**Second Semester**			**U**
	First Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Biological Sciences with B.E. Electronics & Communication)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	Same as First degree Programme				Same as First degree Programme			
II	**First Semester**			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	BIO	F211	Biological Chemistry	3			or	
	BIO	F213	Cell Biology	3	MGTS	F211	Principles of Management	3
	BIO	F212	Microbiology	4	BIO	F241	Ecology & Environmental Science	3
	BIO	F214	Integrated Biology	3	BIO	F242	Introduction to Bioinformatics	3
					BIO	F243	Genetics	3
			Humanities Elective	3	BIO	F244	Instrumentation of Analysis	4
	BITS	F225	Environmental Studies	3			Humanities Electives	5
				22				**21**
Summer	**BITS F221 Practice School -1 (for PS Option Only) (5 Units)**							
III	**First Semester**			**U**	**Second Semester**			**U**
	BIO	F311	Recombinant DNA Technology	3	BIO	F341	Developmental Biology	3
	BIO	F312	Plant Physiology	3	BIO	F342	Immunology	3
	BIO	F313	Animal Physiology	3	BIO	F215	Biophysics	3
	ECE	F212	Electromagnetic Theory	3	ECE	F241	Microprocessors & Interfacing	4
	ECE	F215	Digital Design	4	ECE	F242	Control Systems	3
	ECE	F211	Electrical Machines	4	ECE	F243	Signals and Systems	3
	ECE	F214	Electronic Devices	3	ECE	F244	Microelectronic Circuits	3
				23				**22**
IV	**First Semester**			**U**	**Second Semester**			**U**
	ECE	F311	Communication Systems	4	ECE	F341	Analog Electronics	4
	ECE	F434	Digital Signal Processing	4	ECE	F344	Information Theory & Coding	3
	ECE	F314	Electromagnetic Fields & Microwave Engineering	3	ECE	F343	Communication Networks	3
			First Discipline Electives	3			First Discipline Elective	6
			Second Discipline Electives	7			Second Discipline Electives	5
				21				**21**
V	**First Semester**			**U**	**Second Semester**			**U**
	First Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T		Thesis	9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Biological Sciences with B.E. Electronics & Instrumentation)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	Same as First degree Programme				Same as First degree Programme			
II	**First Semester**			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	BIO	F211	Biological Chemistry	3			or	
	BIO	F213	Cell Biology	3	MGTS	F211	Principles of Management	3
	BIO	F212	Microbiology	4	BIO	F241	Ecology & Environmental Science	3
	BIO	F214	Integrated Biology	3	BIO	F242	Introduction to Bioinformatics	3
			Humanities Elective	3	BIO	F243	Genetics	3
	BITS	F225	Environmental Studies	3	BIO	F244	Instrumental Methods of Analysis	4
							Humanities Electives	5
				22				**21**
Summer	**BITS F221 Practice School -1 (for PS Option Only) (5 Units)**							
III	**First Semester**			**U**	**Second Semester**			**U**
	BIO	F311	Recombinant DNA Technology	3	BIO	F341	Developmental Biology	3
	BIO	F312	Plant Physiology	3	BIO	F342	Immunology	3
	BIO	F313	Animal Physiology	3	BIO	F215	Biophysics	3
	INSTR	F212	Electromagnetic Theory	3	INSTR	F241	Microprocessors & Interfacing	4
	INSTR	F215	Digital Design	4	INSTR	F242	Control Systems	3
	INSTR	F211	Electrical Machines	4	INSTR	F243	Signals & Systems	3
	INSTR	F214	Electronic Devices	3	INSTR	F244	Microelectronic Circuits	3
				23				**22**
IV	**First Semester**			**U**	**Second Semester**			**U**
	INSTR	F311	Electronic Instruments &		INSTR	F341	Analog Electronics	4
			Instrumentation Technology	4	INSTR	F342	Power Electronics	4
	INSTR	F312	Transducers and Measurement Systems	3	INSTR	F343	Industrial Instrumentation & Control	3
	INSTR	F313	Analog & Digital VLSI Design	3			First Discipline Electives	6
			First Discipline Electives	9			Second Discipline Electives	4
			Second Discipline Electives	3				
				22				**21**
V	**First Semester**			**U**	**Second Semester**			**U**
	First Discipline Electives			5	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Biological Sciences with B.E. Manufacturing)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	Same as First degree Programme				Same as First degree Programme			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	BIO	F211	Biological Chemistry	3			or	
	BIO	F213	Cell Biology	3	MGTS	F211	Principles of Management	3
	BIO	F212	Microbiology	4	BIO	F241	Ecology & Environmental Science	3
	BIO	F214	Integrated Biology	3	BIO	F242	Introduction to Bioinformatics	3
			Humanities Elective	3	BIO	F243	Genetics	3
	BITS	F225	Environmental Studies	3	BIO	F244	Instrumental Methods of Analysis	4
							Humanities Electives	5
				22				**21**
Summer	**BITS F221 Practice School -1 (for PS Option Only) (5 Units)**							
	First Semester			**U**	**Second Semester**			**U**
III	BIO	F311	Recombinant DNA Technology	3	BIO	F341	Developmental Biology	3
	BIO	F312	Plant Physiology	3	BIO	F342	Immunology	3
	BIO	F313	Animal Physiology	3	BIO	F215	Biophysics	3
	MF	F211	Mechanics of Solids	3	MF	F219	Operations Management	3
	MF	F216	Materials Science & Engineering	3	MF	F220	Metrology and Quality Assurance	3
	MF	F217	Machine Drawing	2	MF	F221	Mechanisms and Machines	3
	MF	F218	Transport Phenomena in Manufacturing	4	MF	F222	Casting, Forming and Welding	4
				21				**22**
	First Semester			**U**	**Second Semester**			**U**
IV	MF	F314	Design of Machine Elements	3	MF	F317	Computer Aided Design and Manufacturing	3
	MF	F315	Automation and Control	4	MF	F318	Non Traditional Manufacturing Processes	3
	MF	F316	Machining and Machine Tools	4	MF	F319	Supply Chain Management	3
			First Discipline Electives	9	MF	F320	Engineering Optimization	3
			Second Discipline Elective	3			First Discipline Electives	6
							Second Discipline Elective	3
				23				**21**
	First Semester			**U**	**Second Semester**			**U**
V	Second Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2019 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Biological Sciences with B.E. Mechanical)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	BIO	F211	Biological Chemistry	3			or	
	BIO	F213	Cell Biology	3	MGTS	F211	Principles of Management	3
	BIO	F212	Microbiology	4	BIO	F241	Ecology & Environmental Science	3
	BIO	F214	Integrated Biology	3	BIO	F242	Introduction to Bioinformatics	3
			Humanities Elective	3	BIO	F243	Genetics	3
	BITS	F225	Environmental Studies	3	BIO	F244	Instrumental Methods of Analysis	4
							Humanities Electives	5
				22				**21**
Summer	**BITS F221 Practice School -1 (for PS Option Only) (5 Units)**							
	First Semester			**U**	**Second Semester**			**U**
III	BIO	F311	Recombinant DNA Technology	3	BIO	F341	Developmental Biology	3
	BIO	F312	Plant Physiology	3	BIO	F342	Immunology	3
	BIO	F313	Animal Physiology	3	BIO	F215	Biophysics	3
	ME	F211	Mechanics of Solids	3	ME	F218	Advanced Mechanics of Solids	2
	ME	F212	Fluid Mechanics	3	ME	F219	Manufacturing Processes	4
	ME	F216	Materials Science & Engineering	3	ME	F220	Heat Transfer	4
	ME	F217	Applied Thermodynamics	4	ME	F221	Mechanisms and Machines	3
				22				**22**
	First Semester			**U**	**Second Semester**			**U**
IV	ME	F314	Design of Machine Elements	3	ME	F318	Computer-Aided Design	3
	ME	F315	Advanced Manufacturing Processes	3	ME	F319	Vibrations & Control	3
	ME	F316	Manufacturing Management	2	ME	F320	Engineering Optimization	3
	ME	F317	Engines, Motors, and Mobility	2	ME	F341	Prime Movers & Fluid Machines	3
			First Discipline Electives	9			First Discipline Electives	6
			Second Discipline Electives	3			Second Discipline Electives	3
				22				**21**
	First Semester			**U**	**Second Semester**			**U**
V	Second Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T		Thesis	9				

Note: This is operative pattern for the students who are admitted from August 2019 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Chemistry with B.E. Chemical)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	CHEM	F211	Physical Chemistry I	3			or	
	CHEM	F212	Organic Chemistry I	3	MGTS	F211	Principles of Management	3
	CHEM	F213	Physical Chemistry II	3	CHEM	F241	Inorganic Chemistry II	3
II	CHEM	F214	Inorganic Chemistry I	3	CHEM	F242	Chemical Experimentation I	3
	PHY	F212	Electromagnetic Theory I	3	CHEM	F243	Organic Chemistry II	3
			Humanities Elective	3	CHEM	F244	Physical Chemistry III	3
							Humanities Electives	5
					BITS	F225	Environmental Studies	3
				21				**23**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
	CHEM	F313	Instrumental Methods of Analysis	4	CHEM	F341	Chemical Experimentation II	4
					CHEM	F342	Organic Chemistry IV	3
	CHEM	F311	Organic Chemistry III	3	CHEM	F343	Inorganic Chemistry III	3
	CHEM	F312	Physical Chemistry IV	3	CHE	F241	Heat Transfer	3
III	CHE	F211	Chemical Process Calculations	3	CHE	F242	Numerical Methods for Chemical Engineers	3
	CHE	F212	Fluid Mechanics	3	CHE	F243	Material Science & Engineering	3
	CHE	F213	Chemical Engineering Thermodynamics	3	CHE	F244	Separation Processes I	3
				19				**22**
	First Semester			**U**	**Second Semester**			**U**
	CHE	F311	Kinetics & Reactor Design	3	CHE	F341	Chemical Engineering	
	CHE	F312	Chemical Engineering Laboratory I	3			Laboratory II	3
IV	CHE	F313	Separation Processes II	3	CHE	F342	Process Dynamics & Control	3
	CHE	F314	Process Design Principles I	3	CHE	F343	Process Design Principles II	3
			First Discipline Electives	6			First Discipline Electives	6
			Second Discipline Electives	3			Second Discipline Electives	6
				21				**21**
	First Semester			**U**	**Second Semester**			**U**
V	Second Discipline Electives			6	BITS F412 Practice School - II			20
	BITS	F423T	Thesis	9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Chemistry with B.E. Civil)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	CHEM	F211	Physical Chemistry I	3			or	
	CHEM	F212	Organic Chemistry I	3	MGTS	F211	Principles of Management	3
	CHEM	F213	Physical Chemistry II	3	CHEM	F241	Inorganic Chemistry II	3
II	CHEM	F214	Inorganic Chemistry I	3	CHEM	F242	Chemical Experimentation I	3
	PHY	F212	Electromagnetic Theory I	3	CHEM	F243	Organic Chemistry II	3
			Humanities Elective	3	CHEM	F244	Physical Chemistry III	3
							Humanities Electives	5
					BITS	F225	Environmental Studies	3
				21				**23**
Summer				**BITS F221 Practice School -1(for PS Option Only)**				
	First Semester			**U**	**Second Semester**			**U**
	CHEM	F313	Instrumental Methods of Analysis	4	CHEM	F341	Chemical Experimentation II	4
	CHEM	F311	Organic Chemistry III	3	CHEM	F342	Organic Chemistry IV	3
	CHEM	F312	Physical Chemistry IV	3	CHEM	F343	Inorganic Chemistry III	3
III	CE	F211	Mechanics of Solids	3	CE	F241	Analysis of structures	3
	CE	**F231**	**Fluid Mechanics**	**3**	CE	F242	Construction Planning & Technology	3
	CE	**F230**	**Civil Engineering Materials**	**4**	CE	F243	Soil Mechanics	4
	CE	F213	Surveying	4	CE	F244	Highway Engineering	4
				24				**24**
	First Semester			**U**	**Second Semester**			**U**
	CE	**F320**	**Design of Reinforced Concrete Structures**	**3**	CE	F342	Water & Waste Water Treatment	4
	CE	F312	Hydraulic Engineering	4	**CE**	**F321**	**Engineering Hydrology**	**3**
IV	CE	F313	Foundation Engineering	3				
			First Discipline Electives	6	CE	F343	Design of Steel Structures	3
			Second Discipline Electives	3			First Discipline Electives	6
							Second Discipline Electives	6
				19				**22**
	First Semester			**U**	**Second Semester**			**U**
V	Second Discipline Electives			3	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from **August 2017** onwards.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Chemistry with B.E. Computer Science)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	CHEM	F211	Physical Chemistry I	3			or	
	CHEM	F212	Organic Chemistry I	3	MGTS	F211	Principles of Management	3
	CHEM	F213	Physical Chemistry II	3	CHEM	F241	Inorganic Chemistry II	3
II	CHEM	F214	Inorganic Chemistry I	3	CHEM	F242	Chemical Experimentation I	3
	PHY	F212	Electromagnetic Theory I	3	CHEM	F243	Organic Chemistry II	3
			Humanities Elective	3	CHEM	F244	Physical Chemistry III	3
							Humanities Electives	5
					BITS	F225	Environmental Studies	3
				21				**23**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
	CHEM	F313	Instrumental Methods of Analysis	4	CHEM	F341	Chemical Experimentation II	4
	CHEM	F311	Organic Chemistry III	3	CHEM	F342	Organic Chemistry IV	3
	CHEM	F312	Physical Chemistry IV	3	CHEM	F343	Inorganic Chemistry III	3
III	CS	F215	Digital Design	4	CS	F241	Microprocessors & Interfacing	4
	CS	F214	Logic in Computer Science	3	CS	F212	Database Systems	4
	CS	F222	Discrete Structures For Computer Science	3	CS	F211	Data Structures & Algorithms	4
	CS	F213	Object Oriented Programming	4				
				24				**22**
	First Semester			**U**	**Second Semester**			**U**
	CS	F351	Theory of Computation	3	CS	F363	Compiler Construction	3
	CS	F372	Operating Systems	3	CS	F364	Design and Analysis of	
	CS	F342	Computer Architecture	4			Algorithms	3
IV	CS	F301	Principles of		CS	F303	Computer Networks	4
			Programming Languages	2			First Discipline Electives	6
			First Discipline Electives	6			Second Discipline Electives	3
			Second Discipline Electives	3				
				21				**19**
	First Semester			**U**	**Second Semester**			**U**
V	Second Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T		Thesis	9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Chemistry with B.E. Electrical & Electronics)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	CHEM	F211	Physical Chemistry I	3			or	
	CHEM	F212	Organic Chemistry I	3	MGTS	F211	Principles of Management	3
	CHEM	F213	Physical Chemistry II	3	CHEM	F241	Inorganic Chemistry II	3
	CHEM	F214	Inorganic Chemistry I	3	CHEM	F242	Chemical Experimentation I	3
	PHY	F212	Electromagnetic Theory I	3		F243	Organic Chemistry II	3
			Humanities Elective	3	CHEM	F244	Physical Chemistry III	3
					CHEM		Humanities Electives	5
					BITS	F225	Environmental Studies	3
				21				**23**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
III	CHEM	F313	Instrumental Methods of Analysis	4	CHEM	F341	Chemical Experimentation II	4
	CHEM	F311	Organic Chemistry III	3	CHEM	F342	Organic Chemistry IV	3
	CHEM	F312	Physical Chemistry IV	3	CHEM	F343	Inorganic Chemistry III	3
	EEE	F211	Electrical Machines	4	EEE	F243	Signals and Systems	3
	EEE	F214	Electronic Devices	3	EEE	F244	Microelectronic Circuits	3
	EEE	F215	Digital Design	4	EEE	F241	Microprocessors & Interfacing	4
					EEE	F242	Control Systems	3
				21				**23**
	First Semester			**U**	**Second Semester**			**U**
IV	EEE	F311	Communication Systems	4	EEE	F341	Analog Electronics	4
					EEE	F342	Power Electronics	4
	MATH	F212	Optimization	3	EEE	F312	Power Systems	3
			or				First Discipline Elective	6
	ME	F344	Engineering Optimization	2			Second Discipline Elective	4
	EEE	F313	Analog & Digital VLSI Design	3				
			First Discipline Electives	6				
			Second Discipline Electives	5				
				20/21				**21**
	First Semester			**U**	**Second Semester**			**U**
V	Second Discipline Electives			3	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes M.Sc. Chemistry with B.E. Electronics & Communication									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	CHEM	F211	Physical Chemistry I	3			or	
	CHEM	F212	Organic Chemistry I	3	MGTS	F211	Principles of Management	3
	CHEM	F213	Physical Chemistry II	3	CHEM	F241	Inorganic Chemistry II	3
II	CHEM	F214	Inorganic Chemistry I	3	CHEM	F242	Chemical Experimentation I	3
	PHY	F212	Electromagnetic Theory I	3	CHEM	F243	Organic Chemistry II	3
			Humanities Elective	3	CHEM	F244	Physical Chemistry III	3
							Humanities Electives	5
					BITS	F225	Environmental Studies	3
				21				**23**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
	CHEM	F313	Instrumental Methods of Analysis	4	CHEM	F341	Chemical Experimentation II	4
	CHEM	F311	Organic Chemistry III	3	CHEM	F342	Organic Chemistry IV	3
	CHEM	F312	Physical Chemistry IV	3	CHEM	F343	Inorganic Chemistry III	3
III	ECE	F215	Digital Design	4	ECE	F241	Microprocessors &	
	ECE	F211	Electrical Machines	4			Interfacing	4
	ECE	F214	Electronic Devices	3	ECE	F242	Control Systems	3
					ECE	F243	Signals and Systems	3
					ECE	F244	Microelectronic Circuits	3
				21				**23**
	First Semester			**U**	**Second Semester**			**U**
	ECE	F311	Communication Systems	4	ECE	F341	Analog Electronics	4
	ECE	F434	Digital Signal Processing	4	ECE	F344	Information Theory & Coding	3
IV	ECE	F314	Electromagnetic Fields & Microwave Engineering	3	ECE	F343	Communication Networks	3
			First Discipline Electives	6			First Discipline Electives	6
			Second Discipline Electives	4			Second Discipline Electives	5
				21				**21**
	First Semester			**U**	**Second Semester**			**U**
V	Second Discipline Electives			3	BITS F412 Practice School - II			20
	BITS F423T		Thesis	9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Chemistry with B.E. Electronics & Instrumentation)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	CHEM	F211	Physical Chemistry I	3	MGTS	F211	or	
	CHEM	F212	Organic Chemistry I	3			Principles of Management	3
	CHEM	F213	Physical Chemistry II	3	CHEM	F241	Inorganic Chemistry II	3
	CHEM	F214	Inorganic Chemistry I	3	CHEM	F242	Chemical Experimentation I	3
	PHY	F212	Electromagnetic Theory I	3	CHEM	F243	Organic Chemistry II	3
			Humanities Elective	3	CHEM	F244	Physical Chemistry III	3
							Humanities Electives	5
					BITS	F225	Environmental Studies	3
				21				**23**
Summer	**BITS F221 Practice School -1(for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
III	CHEM	F313	Instrumental Methods of Analysis	4	CHEM	F341	Chemical Experimentation II	4
	CHEM	F311	Organic Chemistry III	3	CHEM	F342	Organic Chemistry IV	3
	CHEM	F312	Physical Chemistry IV	3	CHEM	F343	Inorganic Chemistry III	3
	INSTR	F215	Digital Design	4	INSTR	F241	Microprocessors & Interfacing	4
	INSTR	F211	Electrical Machines	4	INSTR	F242	Control Systems	3
	INSTR	F214	Electronic Devices	3	INSTR	F243	Signals & Systems	3
					INSTR	F244	Microelectronic Circuits	3
				21				**23**
IV	**First Semester**			**U**	**Second Semester**			**U**
	INSTR	F311	Electronic Instruments & Instrumentation Technology	4	INSTR	F341	Analog Electronics	4
					INSTR	F342	Power Electronics	4
	INSTR	F312	Transducers and Measurement Systems	3	INSTR	F343	Industrial Instrumentation & Control	3
	INSTR	F313	Analog & Digital VLSI Design	3			First Discipline Electives	6
			First Discipline Electives	6			Second Discipline Electives	4
			Second Discipline Electives	5				
				21				**21**
V	**First Semester**			**U**	**Second Semester**			**U**
	Second Discipline Electives			3	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Chemistry with B.E. Manufacturing)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	CHEM	F211	Physical Chemistry I	3			or	
	CHEM	F212	Organic Chemistry I	3	MGTS	F211	Principles of Management	3
	CHEM	F213	Physical Chemistry II	3	CHEM	F241	Inorganic Chemistry II	3
II	CHEM	F214	Inorganic Chemistry I	3	CHEM	F242	Chemical Experimentation I	3
	PHY	F212	Electromagnetic Theory I	3	CHEM	F243	Organic Chemistry II	3
			Humanities Elective	3	CHEM	F244	Physical Chemistry III	3
							Humanities Electives	5
					BITS	F225	Environmental Studies	3
				21				**23**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
	CHEM	F313	Instrumental Methods of Analysis	4	CHEM	F341	Chemical Experimentation II	4
	CHEM	F311	Organic Chemistry III	3	CHEM	F342	Organic Chemistry IV	3
	CHEM	F312	Physical Chemistry IV	3	CHEM	F343	Inorganic Chemistry III	3
	MF	F211	Mechanics of Solids	3	MF	F219	Operations Management	3
III	MF	F216	Materials Science & Engineering	3	MF	F220	Metrology and Quality Assurance	3
	MF	F217	Machine Drawing	2	MF	F221	Mechanisms and Machines	3
	MF	F218	Transport Phenomena in Manufacturing	4	MF	F222	Casting, Forming and Welding	4
				22				**23**
	First Semester			**U**	**Second Semester**			**U**
	MF	F314	Design of Machine Elements	3	MF	F317	Computer Aided Design and Manufacturing	3
	MF	F315	Automation and Control	4	MF	F318	Non Traditional Manufacturing Processes	3
IV	MF	F316	Machining and Machine Tools	4	MF	F319	Supply Chain Management	3
					MF	F320	Engineering Optimization	3
			First Discipline Electives	6			First Discipline Electives	6
			Second Discipline Elective	6			Second Discipline Elective	3
				23				**21**
	First Semester			**U**	**Second Semester**			**U**
V	Second Discipline Electives			3	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2019 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Chemistry with B.E. Mechanical)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	CHEM	F211	Physical Chemistry I	3			or	
	CHEM	F212	Organic Chemistry I	3	MGTS	F211	Principles of Management	3
	CHEM	F213	Physical Chemistry II	3	CHEM	F241	Inorganic Chemistry II	3
II	CHEM	F214	Inorganic Chemistry I	3	CHEM	F242	Chemical Experimentation I	3
	PHY	F212	Electromagnetic Theory I	3	CHEM	F243	Organic Chemistry II	3
			Humanities Elective	3	CHEM	F244	Physical Chemistry III	3
							Humanities Electives	5
					BITS	F225	Environmental Studies	3
				21				**23**
Summer	**BITS F221 Practice School -1(for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
	CHEM	F313	Instrumental Methods of Analysis	4	CHEM	F341	Chemical Experimentation II	4
	CHEM	F311	Organic Chemistry III	3	CHEM	F342	Organic Chemistry IV	3
	CHEM	F312	Physical Chemistry IV	3	CHEM	F343	Inorganic Chemistry III	3
III	ME	F211	Mechanics of Solids	3	ME	F218	Advanced Mechanics of Solids	2
	ME	F212	Fluid Mechanics	3	ME	F219	Manufacturing Processes	4
	ME	F216	Materials Science & Engineering	3	ME	F220	Heat Transfer	4
	ME	F217	Applied Thermodynamics	4	ME	F221	Mechanisms and Machines	3
				23				**23**
	First Semester			**U**	**Second Semester**			**U**
	ME	F314	Design of Machine Elements	3	ME	F318	Computer-Aided Design	3
	ME	F315	Advanced Manufacturing Processes	3	ME	F319	Vibrations & Control	3
	ME	F316	Manufacturing Management	2	ME	F320	Engineering Optimization	3
IV	ME	F317	Engines, Motors, and Mobility	2	ME	F341	Prime Movers & Fluid Machines	3
			First Discipline Electives	6				
			Second Discipline Electives	3			First Discipline Electives	6
							Second Discipline Electives	3
				19				**21**
	First Semester			**U**	**Second Semester**			**U**
V	Second Discipline Electives			3	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2019 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Economics with B.E. Chemical)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	MGTS	F211	Principles of Management	3
	ECON	F211	Principles of Economics	3	ECON	F241	Econometric Methods	3
	ECON	F212	Fundamentals of Finance & Accounts	3	ECON	F242	Microeconomics	3
	ECON	F213	Mathematical & Statistical Methods	3	ECON	F243	Macroeconomics	3
	ECON	F214	Economic Environment of Business	3	ECON	F244	Economics of Growth & Development	3
			Humanities Elective	3			Humanities Electives	5
	BITS	F225	Environmental Studies	3				
				21				**20**
Summer	**BITS F221 Practice School -1(for PS Option Only)**							
III	**First Semester**			**U**	**Second Semester**			**U**
	ECON	F311	International Economics	3	ECON	F341	Public Finance Theory & Policy	3
	ECON	F312	Money Banking & Financial Markets	3	ECON	F342	Applied Econometrics	3
	ECON	F313	Issues in Economic Development	3	ECON	F343	Economic Analysis of Public Policy	3
			First Discipline Elective	3			First Discipline Elective	3
	CHE	F211	Chemical Process Calculations	3	CHE	F241	Heat Transfer	3
	CHE	F212	Fluid Mechanics	3	CHE	F242	Numerical Methods for Chemical Engineers	3
	CHE	F214	Engineering Chemistry	3	CHE	F243	Material Science & Engineering	3
	CHE	F213	Chemical Engineering Thermodynamics	3	CHE	F244	Separation Processes I	3
				24				**24**
IV	**First Semester**			**U**	**Second Semester**			**U**
	CHE	F311	Kinetics & Reactor Design	3	CHE	F341	Chemical Engineering Laboratory II	3
	CHE	F312	Chemical Engineering Laboratory I	3	CHE	F342	Process Dynamics & Control	3
	CHE	F313	Separation Processes II	3	CHE	F343	Process Design Principles II	3
	CHE	F314	Process Design Principles I	3			First Discipline Electives	6
			First Discipline Electives	6			Second Discipline Electives	6
			Second Discipline Electives	3				
				21				**21**
V	**First Semester**			**U**	**Second Semester**			**U**
	Second Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Economics with B.E. Civil)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	MGTS	F211	Principles of Management	3
	ECON	F211	Principles of Economics	3	ECON	F241	Econometric Methods	3
	ECON	F212	Fundamentals of Finance & Accounts	3	ECON	F242	Microeconomics	3
	ECON	F213	Mathematical & Statistical Methods	3	ECON	F243	Macroeconomics	3
	ECON	F214	Economic Environment of Business	3	ECON	F244	Economics of Growth & Development	3
			Humanities Elective	3			Humanities Electives	5
	BITS	F225	Environmental Studies	3				
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
III	ECON	F311	International Economics	3	ECON	F341	Public Finance Theory & Policy	3
	ECON	F312	Money Banking & Financial Markets	3	ECON	F342	Applied Econometrics	3
	ECON	F313	Issues in Economic Development	3	ECON	F343	Economic Analysis of Public Policy	3
	CE	F211	Mechanics of Solids	3	CE	F241	Analysis of Structures	3
	CE	F213	Surveying	4	CE	F242	Construction Planning & Technology	3
	CE	F230	Civil Engineering Materials	4	CE	F243	Soil Mechanics	4
	CE	F231	Fluid Mechanics	3	CE	F244	Highway Engineering	4
				23				**23**
	First Semester			**U**	**Second Semester**			**U**
IV	CE	F312	Hydraulic Engineering	4	CE	F321	Engineering Hydrology	3
	CE	F313	Foundation Engineering	3	CE	F342	Water & Waste Water	4
	CE	F320	Design of Reinforced Concrete Structures	3	CE	F343	Design of Steel Structures	3
							First Discipline Electives	6
			First Discipline Electives	6			Second Discipline Electives	6
			Second Discipline Electives	6				
				22				**22**
V	**First Semester**			**U**	**Second Semester**			**U**
	First Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from **August 2017** onwards.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Economics with B.E. Computer Science)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	MGTS	F211	Principles of Management	3
	ECON	F211	Principles of Economics	3	ECON	F241	Econometric Methods	3
	ECON	F212	Fundamentals of Finance & Accounts	3	ECON	F242	Microeconomics	3
	ECON	F213	Mathematical & Statistical Methods	3	ECON	F243	Macroeconomics	3
	ECON	F214	Economic Environment of Business	3	ECON	F244	Economics of Growth & Development	3
			Humanities Elective	3			Humanities Electives	5
	BITS	F225	Environmental Studies	3				
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
III	**First Semester**			**U**	**Second Semester**			**U**
	ECON	F311	International Economics	3	ECON	F341	Public Finance Theory & Policy	
	ECON	F312	Money Banking & Financial Markets	3	ECON	F342	Applied Econometrics	3
	ECON	F313	Issues in Economic Development	3	ECON	F343	Economic Analysis of Public Policy	3
	CS	F215	Digital Design	4	CS	F241	Microprocessors & Interfacing	4
	CS	F214	Logic in Computer Science	3	CS	F212	Database Systems	4
	CS	F222	Discrete Structures for Computer Science	3	CS	F211	Data Structures & Algorithms	4
	CS	F213	Object Oriented Programming	4				
				23				**21**
IV	**First Semester**			**U**	**Second Semester**			**U**
	CS	F351	Theory of Computation	3	CS	F363	Compiler Construction	3
	CS	F372	Operating Systems	3	CS	F364	Design and Analysis of Algorithms	3
	CS	F342	Computer Architecture	4	CS	F303	Computer Networks	4
	CS	F301	Principles of Programming Languages	2			First Discipline Electives	6
			First Discipline Electives	6			Second Discipline Electives	6
			Second Discipline Electives	6				
				24				**22**
V	**First Semester**			**U**	**Second Semester**			**U**
	First Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Economics with B.E. Electrical & Electronics)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	MGTS	F211	Principles of Management	3
	ECON	F211	Principles of Economics	3	ECON	F241	Econometric Methods	3
	ECON	F212	Fundamentals of Finance & Accounts	3	ECON	F242	Microeconomics	3
	ECON	F213	Mathematical & Statistical Methods	3	ECON	F243	Macroeconomics	3
	ECON	F214	Economic Environment of Business	3	ECON	F244	Economics of Growth & Development	3
			Humanities Electives	3			Humanities Electives	5
	BITS	F225	Environmental Studies	3				
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
III	ECON	F311	International Economics	3	ECON	F341	Public Finance Theory & Policy	3
	ECON	F312	Money Banking & Financial Markets	3	ECON	F342	Applied Econometrics	3
	ECON	F313	Issues in Economic Development	3	ECON	F343	Economic Analysis of Public Policy	3
	EEE	F212	Electromagnetic Theory	3	EEE	F243	Signals and Systems	3
	EEE	F211	Electrical Machines	4	EEE	F244	Microelectronic Circuits	3
	EEE	F214	Electronic Devices	3	EEE	F241	Microprocessors & Interfacing	4
	EEE	F215	Digital Design	4	EEE	F242	Control Systems	3
				23				**22**
	First Semester			**U**	**Second Semester**			**U**
IV	EEE	F311	Communication Systems	4	EEE	F341	Analog Electronics	4
	MATH	F212	Optimization	3	EEE	F342	Power Electronics	4
			or		EEE	F312	Power Systems	3
	ME	F344	Engineering Optimization	2			First Discipline Electives	6
	EEE	F313	Analog & Digital VLSI Design	3			Second Discipline Elective	4
			First Discipline Electives	6				
			Second Discipline Electives	8				
				23/24				**21**
	First Semester			**U**	**Second Semester**			**U**
V	First Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Economics with B.E. Electronics & Communication)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	MGTS	F211	Principles of Management	3
	ECON	F211	Principles of Economics	3	ECON	F241	Econometric Methods	3
	ECON	F212	Fundamentals of Finance & Accounts	3	ECON	F242	Microeconomics	3
	ECON	F213	Mathematical & Statistical Methods	3	ECON	F243	Macroeconomics	3
	ECON	F214	Economic Environment of Business	3	ECON	F244	Economics of Growth & Development	3
			Humanities Elective	3			Humanities Electives	5
	BITS	F225	Environmental Studies	3				
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
III	ECON	F311	International Economics	3	ECON	F341	Public Finance Theory & Policy	3
	ECON	F312	Money Banking & Financial Markets	3	ECON	F342	Applied Econometrics	3
	ECON	F313	Issues in Economic Development	3	ECON	F343	Economic Analysis of Public Policy	3
	ECE	F212	Electromagnetic Theory	3	ECE	F241	Microprocessors & Interfacing	4
	ECE	F215	Digital Design	4	ECE	F242	Control Systems	3
	ECE	F211	Electrical Machines	4	ECE	F243	Signals and Systems	3
	ECE	F214	Electronic Devices	3	ECE	F244	Microelectronic Circuits	3
				23				**22**
	First Semester			**U**	**Second Semester**			**U**
IV	ECE	F311	Communication Systems	4	ECE	F341	Analog Electronics	4
	ECE	F434	Digital Signal Processing	4	ECE	F344	Information Theory & Coding	3
	ECE	F314	Electromagnetic Fields &		ECE	F343	Communication Networks	3
			Microwave Engineering	3			First Discipline Electives	6
			First Discipline Electives	6			Second Discipline Electives	5
			Second Discipline Electives	7				
				24				**21**
V	**First Semester**			**U**	**Second Semester**			**U**
	First Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Economics with B.E. Electronics & Instrumentation)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
II	**First Semester**			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	MGTS	F211	Principles of Management	3
	ECON	F211	Principles of Economics	3	ECON	F241	Econometric Methods	3
	ECON	F212	Fundamentals of Finance & Accounts	3	ECON	F242	Microeconomics	3
	ECON	F213	Mathematical & Statistical Methods	3	ECON	F243	Macroeconomics	3
	ECON	F214	Economic Environment of Business	3	ECON	F244	Economics of Growth & Development	3
			Humanities Elective	3			Humanities Electives	5
	BITS	F225	Environmental Studies	3				
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
III	**First Semester**			**U**	**Second Semester**			**U**
	ECON	F311	International Economics	3	ECON	F341	Public Finance Theory & Policy	3
	ECON	F312	Money Banking & Financial Markets	3	ECON	F342	Applied Econometrics	3
	ECON	F313	Issues in Economic Development	3	ECON	F343	Economic Analysis of Public Policy	3
	INSTR	F212	Electromagnetic Theory	3	INSTR	F241	Microprocessors & Interfacing	4
	INSTR	F215	Digital Design	4	INSTR	F242	Control Systems	3
	INSTR	F211	Electrical Machines	4	INSTR	F243	Signals & Systems	3
	INSTR	F214	Electronic Devices	3	INSTR	F244	Microelectronic Circuits	3
				23				**22**
IV	**First Semester**			**U**	**Second Semester**			**U**
	INSTR	F311	Electronic Instruments & Instrumentation Technology	4	INSTR	F341	Analog Electronics	4
	INSTR	F312	Transducers and Measurement Systems	3	INSTR	F342	Power Electronics	4
	INSTR	F313	Analog & Digital VLSI Design	3	INSTR	F343	Industrial Instrumentation & Control	3
			First Discipline Electives	6			First Discipline Electives	6
			Second Discipline Electives	8			Second Discipline Electives	4
				24				**21**
V	**First Semester**			**U**	**Second Semester**			**U**
	First Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Economics with B.E. Manufacturing)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	MGTS	F211	Principles of Management	3
	ECON	F211	Principles of Economics	3	ECON	F241	Econometric Methods	3
	ECON	F212	Fundamentals of Finance & Accounts	3	ECON	F242	Microeconomics	3
	ECON	F213	Mathematical & Statistical Methods	3	ECON	F243	Macroeconomics	3
	ECON	F214	Economic Environment of Business	3	ECON	F244	Economics of Growth & Development	3
			Humanities Elective	3			Humanities Electives	5
	BITS	F225	Environmental Studies	3				
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
III	ECON	F311	International Economics	3	ECON	F341	Public Finance Theory & Policy	3
	ECON	F312	Money Banking & Financial Markets	3	ECON	F342	Applied Econometrics	3
	ECON	F313	Issues in Economic Development	3	ECON	F343	Economic Analysis of Public Policy	3
	MF	F211	Mechanics of Solids	3	MF	F219	Operations Management	3
	MF	F216	Materials Science & Engineering	3	MF	F220	Metrology and Quality Assurance	3
	MF	F217	Machine Drawing	2	MF	F221	Mechanisms and Machines	3
	MF	F218	Transport Phenomena in Manufacturing	4	MF	F222	Casting, Forming and Welding	4
							First Discipline Elective	3
				21				**25**
IV	**First Semester**			**U**	**Second Semester**			**U**
	MF	F314	Design of Machine Elements	3	MF	F317	Computer Aided Design and Manufacturing	3
	MF	F315	Automation and Control	4	MF	F318	Non Traditional Manufacturing Processes	3
	MF	F316	Machining and Machine Tools	4	MF	F319	Supply Chain Management	3
					MF	F320	Engineering Optimization	3
			First Discipline Electives	6			First Discipline Elective	3
			Second Discipline Electives	6			Second Discipline Electives	6
				23				**21**
V	**First Semester**			**U**	**Second Semester**			**U**
	First Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T		Thesis	9				

Note: This is operative pattern for the students who are admitted from August 2019 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Economics with B.E. Mechanical)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	MGTS	F211	Principles of Management	3
	ECON	F211	Principles of Economics	3	ECON	F241	Econometric Methods	3
	ECON	F212	Fundamentals of Finance & Accounts	3	ECON	F242	Microeconomics	3
					ECON	F243	Macroeconomics	3
	ECON	F213	Mathematical & Statistical Methods	3	ECON	F244	Economics of Growth & Development	3
	ECON	F214	Economic Environment of Business	3			Humanities Electives	5
			Humanities Electives	3				
	BITS	F225	Environmental Studies	3				
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
III	**First Semester**			**U**	**Second Semester**			**U**
	ECON	F311	International Economics	3	ECON	F341	Public Finance Theory & Policy	3
	ECON	F312	Money Banking & Financial Markets	3	ECON	F342	Applied Econometrics	3
	ECON	F313	Issues in Economic Development	3	ECON	F343	Economic Analysis of Public Policy	3
	ME	F211	Mechanics of Solids	3	ME	F218	Advanced Mechanics of Solids	2
	ME	F212	Fluid Mechanics	3	ME	F219	Manufacturing Processes	4
	ME	F216	Materials Science & Engineering	3	ME	F220	Heat Transfer	4
	ME	F217	Applied Thermodynamics	4	ME	F221	Mechanisms and Machines	3
				22				**22**
IV	**First Semester**			**U**	**Second Semester**			**U**
	ME	F314	Design of Machine Elements	3	ME	F318	Computer-Aided Design	3
	ME	F315	Advanced Manufacturing Processes	3	ME	F319	Vibrations & Control	3
	ME	F316	Manufacturing Management	2	ME	F320	Engineering Optimization	3
	ME	F317	Engines, Motors, and Mobility	2	ME	F341	Prime Movers & Fluid Machines	3
			First Discipline Electives	6			First Discipline Electives	6
			Second Discipline Electives	6			Second Discipline Electives	6
				22				**24**
V	**First Semester**			**U**	**Second Semester**			**U**
	First Discipline Electives			6	BITS F412		Practice School - II	20
	BITS F423T		Thesis	9				

Note: This is operative pattern for the students who are admitted from August 2019 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Mathematics with B.E. Chemical)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	MATH	F212	Optimization	3			or	
	MATH	F213	Discrete Mathematics	3	MGTS	F211	Principles of Management	3
	MATH	F214	Elementary Real Analysis	3	MATH	F241	Mathematical Methods	3
	MATH	F215	Algebra I	3	MATH	F242	Operations Research	3
			Humanities Elective	3	MATH	F243	Graphs & Networks	3
	BITS	F225	Environmental Studies	3	MATH	F244	Measure & Integration	3
							Humanities Electives	5
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
III	MATH	F311	Introduction to Topology	3	MATH	F341	Introduction to Functional Analysis	3
	MATH	F312	Ordinary Differential Equations	3	MATH	F342	Differential Geometry	3
	MATH	F313	Numerical Analysis	3	MATH	F343	Partial Differential Equations	3
	CHE	F211	Chemical Process Calculations	3	CHE	F241	Heat Transfer	3
	CHE	F212	Fluid Mechanics	3	CHE	F242	Numerical Methods for Chemical Engineers	3
	CHE	F214	Engineering Chemistry	3	CHE	F243	Material Science & Engineering	3
	CHE	F213	Chemical Engineering Thermodynamics	3	CHE	F244	Separation Processes I	3
				21				**21**
IV	**First Semester**			**U**	**Second Semester**			**U**
	CHE	F311	Kinetics & Reactor Design	3	CHE	F341	Chemical Engineering Laboratory II	3
	CHE	F312	Chemical Engineering Laboratory I	3	CHE	F342	Process Dynamics & Control	3
	CHE	F313	Separation Processes II	3	CHE	F343	Process Design Principles II	3
	CHE	F314	Process Design Principles I	3			First Discipline Electives	9
			First Discipline Electives	6			Second Discipline Electives	6
			Second Discipline Electives	3				
				21				**24**
V	**First Semester**			**U**	**Second Semester**			**U**
	Second Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T		Thesis	9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Mathematics with B.E. Civil Engineering)							
Year	**First Semester**			**U**	**Second Semester**		**U**
I	**Same as First degree Programme**				**Same as First degree Programme**		
	First Semester			**U**	**Second Semester**		**U**
II	MATH F211 Mathematics III			3	ECON F211 Principles of Economics		3
	MATH F212 Optimization			3	or		
	MATH F213 Discrete Mathematics			3	MGTS F211 Principles of Management		3
	MATH F214 Elementary Real Analysis			3	MATH F241 Mathematical Methods		3
	MATH F215 Algebra I			3	MATH F242 Operations Research		3
	Humanities Elective			3	MATH F243 Graphs & Networks		3
	BITS F225 Environmental Studies			3	MATH F244 Measure & Integration		3
					Humanities Electives		5
				21			**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**						
III	**First Semester**			**U**	**Second Semester**		**U**
	MATH F311 Introduction to Topology			3	MATH F341 Introduction to Functional Analysis		3
	MATH F312 Ordinary Differential Equations			3	MATH F342 Differential Geometry		3
	MATH F313 Numerical Analysis			3	MATH F343 Partial Differential Equations		3
	CE F211 Mechanics of Solids			3	CE F241 Analysis of structures		3
	CE F231 Fluid Mechanics			**3**	CE F242 Construction Planning & Technology		3
	CE F230 Civil Engineering Materials			**4**	CE F243 Soil Mechanics		4
	CE F213 Surveying			4	CE F244 Highway Engineering		4
				23			**23**
IV	**First Semester**			**U**	**Second Semester**		**U**
	CE F320 Design of Reinforced Concrete Structures			**3**	CE F342 Water & Waste Water Treatment		4
	CE F312 Hydraulic Engineering			4	CE F321 Engineering Hydrology		**3**
	CE F313 Foundation Engineering			3	CE F343 Design of Steel Structures		3
	First Discipline Electives			6	First Discipline Electives		9
	Second Discipline Electives			3	Second Discipline Electives		3
				19			**22**
V	**First Semester**			**U**	**Second Semester**		**U**
	Second Discipline Electives			6	BITS F412 Practice School - II		20
	BITS F423T Thesis			9			

Note: This is operative pattern for the students who are admitted from **August 2017** onwards.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Mathematics with B.E. Computer Science)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	MATH	F212	Optimization	3			or	
	MATH	F213	Discrete Mathematics	3	MGTS	F211	Principles of Management	3
	MATH	F214	Elementary Real Analysis	3	MATH	F241	Mathematical Methods	3
	MATH	F215	Algebra I	3	MATH	F242	Operations Research	3
			Humanities Elective	3	MATH	F243	Graphs & Networks	3
	BITS	F225	Environmental Studies	3	MATH	F244	Measure & Integration	3
							Humanities Electives	5
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
III	MATH	F311	Introduction to Topology	3	MATH	F341	Introduction to Functional	
	MATH	F312	Ordinary Differential Equations	3			Analysis	3
					MATH	F342	Differential Geometry	3
	MATH	F313	Numerical Analysis	3	MATH	F343	Partial Differential Equations	3
	CS	F215	Digital Design	4	CS	F241	Microprocessors & Interfacing	4
	CS	F214	Logic in Computer Science	3	CS	F212	Database Systems	4
	CS	F213	Object Oriented Programming	4	CS	F211	Data Structures & Algorithms	4
				20				**21**
	First Semester			**U**	**Second Semester**			**U**
IV	CS	F351	Theory of Computation	3	CS	F363	Compiler Construction	3
	CS	F372	Operating Systems	3	CS	F364	Design and Analysis of Algorithms	3
	CS	F342	Computer Architecture	4	CS	F303	Computer Networks	4
	CS	F301	Principles of Programming Languages	2			Fist Discipline Elective	6
			First Discipline Electives	3			Second Discipline Electives	6
			Second Discipline Electives	6				
				21				**22**
V	**First Semester**			**U**	**Second Semester**			**U**
	First Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Mathematics with B.E. Electrical & Electronics)							
Year	**First Semester**			**U**	**Second Semester**		**U**
I	**Same as First degree Programme**				**Same as First degree Programme**		
	First Semester			**U**	**Second Semester**		**U**
	MATH F211		Mathematics III	3	ECON F211	Principles of Economics	3
	MATH F212		Optimization	3		or	
	MATH F213		Discrete Mathematics	3	MGTS F211	Principles of Management	3
	MATH F214		Elementary Real Analysis	3	MATH F241	Mathematical Methods	3
II	MATH F215		Algebra I	3	MATH F242	Operations Research	3
					MATH F243	Graphs & Networks	3
			Humanities Elective	3	MATH F244	Measure & Integration	3
	BITS F225		Environmental Studies	3			
						Humanities Electives	5
				21			**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**						
	First Semester			**U**	**Second Semester**		**U**
	MATH F311		Introduction to Topology	3	MATH F341	Introduction to Functional	
	MATH F312		Ordinary Differential Equations	3		Analysis	3
	MATH F313		Numerical Analysis	3	MATH F342	Differential Geometry	3
	EEE F212		Electromagnetic Theory	3	MATH F343	Partial Differential Equations	3
III	EEE F211		Electrical Machines	4	EEE F243	Signals and Systems	3
	EEE F214		Electronic Devices	3	EEE F244	Microelectronic Circuits	3
	EEE F215		Digital Design	4	EEE F241	Microprocessors &	
						Interfacing	4
					EEE F242	Control Systems	3
				23			**22**
	First Semester			**U**	**Second Semester**		**U**
	EEE F311		Communication Systems	4	EEE F341	Analog Electronics	4
	EEE F313		Analog & Digital VLSI Design	3	EEE F342	Power Electronics	4
					EEE F312	Power Systems	3
IV			First Discipline Electives	6		Fist Discipline Elective	6
			Second Discipline Electives	8		Second Discipline Elective	4
				21			**21**
	First Semester			**U**	**Second Semester**		**U**
V	First Discipline Electives			3	BITS F412 Practice School - II		20
	BITS F423T		Thesis	9			

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Mathematics with B.E. Electronics & Communication)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	MATH	F212	Optimization	3			or	
	MATH	F213	Discrete Mathematics	3	MGTS	F211	Principles of Management	3
	MATH	F214	Elementary Real Analysis	3	MATH	F241	Mathematical Methods	3
II	MATH	F215	Algebra I	3	MATH	F242	Operations Research	3
					MATH	F243	Graphs & Networks	3
			Humanities Elective	3	MATH	F244	Measure & Integration	3
	BITS	F225	Environmental Studies	3			Humanities Electives	5
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
	MATH	F311	Introduction to Topology	3	MATH	F341	Introduction to Functional Analysis	3
	MATH	F312	Ordinary Differential Equations	3	MATH	F342	Differential Geometry	3
	MATH	F313	Numerical Analysis	3	MATH	F343	Partial Differential Equations	3
III	ECE	F212	Electromagnetic Theory	3	ECE	F241	Microprocessors & Interfacing	4
	ECE	F215	Digital Design	4	ECE	F242	Control Systems	3
	ECE	F211	Electrical Machines	4	ECE	F243	Signals and Systems	3
	ECE	F214	Electronic Devices	3	ECE	F244	Microelectronic Circuits	3
				23				**22**
	First Semester			**U**	**Second Semester**			**U**
	ECE	F311	Communication Systems	4	ECE	F341	Analog Electronics	4
	ECE	F434	Digital Signal Processing	4	ECE	F344	Information Theory & Coding	3
V	ECE	F314	Electromagnetic Fields & Microwave Engineering	3	ECE	F343	Communication Networks	3
			First Discipline Electives	3			First Discipline Electives	6
			Second Discipline Electives	7			Second Discipline Electives	5
				21				**21**
	First Semester			**U**	**Second Semester**			**U**
V	First Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Mathematics with B.E. Electronics & Instrumentation)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	MATH	F212	Optimization	3			or	
	MATH	F213	Discrete Mathematics	3	MGTS	F211	Principles of Management	3
	MATH	F214	Elementary Real Analysis	3	MATH	F241	Mathematical Methods	3
	MATH	F215	Algebra I	3	MATH	F242	Operations Research	3
			Humanities Elective	3	MATH	F243	Graphs & Networks	3
	BITS	F225	Environmental Studies	3	MATH	F244	Measure & Integration	3
							Humanities Electives	5
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
III	**First Semester**			**U**	**Second Semester**			**U**
	MATH	F311	Introduction to Topology	3	MATH	F341	Introduction to Functional Analysis	3
	MATH	F312	Ordinary Differential Equations	3	MATH	F342	Differential Geometry	3
	MATH	F313	Numerical Analysis	3	MATH	F343	Partial Differential Equations	3
	INSTR	F212	Electromagnetic Theory	3	INSTR	F241	Microprocessors & Interfacing	4
	INSTR	F215	Digital Design	4	INSTR	F242	Control Systems	3
	INSTR	F211	Electrical Machines	4	INSTR	F243	Signals & Systems	3
	INSTR	F214	Electronic Devices	3	INSTR	F244	Microelectronic Circuits	3
				23				**22**
IV	**First Semester**			**U**	**Second Semester**			**U**
	INSTR	F311	Electronic Instruments & Instrumentation Technology	4	INSTR	F341	Analog Electronics	4
	INSTR	F312	Transducers and Measurement Systems	3	INSTR	F342	Power Electronics	4
	INSTR	F313	Analog & Digital VLSI Design	3	INSTR	F343	Industrial Instrumentation & Control	3
			First Discipline Electives	3			Fist Discipline Elective	6
			Second Discipline Electives	8			Second Discipline Electives	4
				21				**21**
V	**First Semester**			**U**	**Second Semester**			**U**
	First Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Mathematics with B.E. Manufacturing)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	MATH	F212	Optimization	3			or	
	MATH	F213	Discrete Mathematics	3	MGTS	F211	Principles of Management	3
	MATH	F214	Elementary Real Analysis	3	MATH	F241	Mathematical Methods	3
II	MATH	F215	Algebra I	3	MATH	F242	Operations Research	3
			Humanities Elective	3	MATH	F243	Graphs & Networks	3
	BITS	F225	Environmental Studies	3	MATH	F244	Measure & Integration	3
							Humanities Electives	5
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
	MATH	F311	Introduction to Topology	3	MATH	F341	Introduction to Functional Analysis	3
	MATH	F312	Ordinary Differential Equations	3	MATH	F342	Differential Geometry	3
	MATH	F313	Numerical Analysis	3	MATH	F343	Partial Differential Equations	3
	MF	F211	Mechanics of Solids	3	MF	F219	Operations Management	3
III	MF	F216	Materials Science & Engineering	3	MF	F220	Metrology and Quality Assurance	3
	MF	F217	Machine Drawing	2	MF	F221	Mechanisms and Machines	3
	MF	F218	Transport Phenomena in Manufacturing	4	MF	F222	Casting, Forming and Welding	4
				21				**22**
	First Semester			**U**	**Second Semester**			**U**
	MF	F314	Design of Machine Elements	3	MF	F317	Computer Aided Design and Manufacturing	3
	MF	F315	Automation and Control	4	MF	F318	Non Traditional Manufacturing Processes	3
IV	MF	F316	Machining and Machine Tools	4	MF	F319	Supply Chain Management	3
			First Discipline Electives	6	MF	F320	Engineering Optimization	3
			Second Discipline Elective	6			First Discipline Electives	3
							Second Discipline Elective	6
				22				**21**
	First Semester			**U**	**Second Semester**			**U**
V	First Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2019 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Mathematics with B.E. Mechanical)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	MATH	F212	Optimization	3			or	
	MATH	F213	Discrete Mathematics	3	MGTS	F211	Principles of Management	3
	MATH	F214	Elementary Real Analysis	3	MATH	F241	Mathematical Methods	3
	MATH	F215	Algebra I	3	MATH	F242	Operations Research	3
			Humanities Elective	3	MATH	F243	Graphs & Networks	3
	BITS	F225	Environmental Studies	3	MATH	F244	Measure & Integration	3
							Humanities Electives	5
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
III	**First Semester**			**U**	**Second Semester**			**U**
	MATH	F311	Introduction to Topology	3	MATH	F341	Introduction to Functional Analysis	3
	MATH	F312	Ordinary Differential Equations	3	MATH	F342	Differential Geometry	3
	MATH	F313	Numerical Analysis	3	MATH	F343	Partial Differential Equations	3
	ME	F211	Mechanics of Solids	3	ME	F218	Advanced Mechanics of Solids	2
	ME	F212	Fluid Mechanics	3	ME	F219	Manufacturing Processes	4
	ME	F216	Materials Science & Engineering	3	ME	F220	Heat Transfer	4
	ME	F217	Applied Thermodynamics	4	ME	F221	Mechanisms and Machines	3
				22				**22**
IV	**First Semester**			**U**	**Second Semester**			**U**
	ME	F314	Design of Machine Elements	3	ME	F318	Computer-Aided Design	3
	ME	F315	Advanced Manufacturing Processes	3	ME	F319	Vibrations & Control	3
	ME	F316	Manufacturing Management	2	ME	F320	Engineering Optimization	3
	ME	F317	Engines, Motors, and Mobility	2	ME	F341	Prime Movers & Fluid Machines	3
			First Discipline Electives	6			First Discipline Electives	9
			Second Discipline Electives	3			Second Discipline Electives	3
				19				**24**
V	**First Semester**			**U**	**Second Semester**			**U**
	Second Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T		Thesis	9				

Note: This is operative pattern for the students who are admitted from August 2019 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Physics with B.E. Chemical)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	PHY	F211	Classical Mechanics	4			or	
	PHY	F212	Electromagnetic Theory I	3	MGTS	F211	Principles of Management	3
	PHY	F213	Optics	3	PHY	F241	Electromagnetic Theory II	4
	PHY	F214	Electricity, Magnetism & Optics Laboratory	2	PHY	F242	Quantum Mechanics I	3
			Humanities Elective	3	PHY	F243	Mathematical Methods of Physics	3
	BITS	F225	Environmental Studies	3	PHY	F244	Modern Physics Laboratory	2
							Humanities Electives	5
				21				**20**
Summer	**BITS F221 Practice School -1(for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
III	PHY	F311	Quantum Mechanics II	3	PHY	F341	Solid State Physics	3
	PHY	F312	Statistical Mechanics	3	PHY	F342	Atomic & Molecular Physics	3
	PHY	F313	Computational Physics	3	PHY	F343	Nuclear & Particle Physics	3
	CHE	F211	Chemical Process Calculations	3	PHY	F344	Advanced Physics Laboratory	3
	CHE	F212	Fluid Mechanics	3	CHE	F241	Heat Transfer	3
	CHE	F214	Engineering Chemistry	3	CHE	F242	Numerical Methods for Chemical Engineers	3
	CHE	F213	Chemical Engineering Thermodynamics	3	CHE	F243	Material Science & Engineering	3
					CHE	F244	Separation Processes I	3
				21				**24**
	First Semester			**U**	**Second Semester**			**U**
IV	CHE	F311	Kinetics & Reactor Design	3	CHE	F341	Chemical Engineering Laboratory II	3
	CHE	F312	Chemical Engineering Laboratory I	3	CHE	F342	Process Dynamics & Control	3
	CHE	F313	Separation Processes II	3	CHE	F343	Process Design Principles II	3
	CHE	F314	Process Design Principles I	3			First Discipline Electives	9
			First Discipline Electives	6			Second Discipline Electives	6
			Second Discipline Electives	3				
				21				**24**
	First Semester			**U**	**Second Semester**			**U**
V	Second Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Physics with B.E. Civil)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
II	**First Semester**			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	PHY	F211	Classical Mechanics	4			or	
	PHY	F212	Electromagnetic Theory I	3	MGTS	F211	Principles of Management	3
	PHY	F213	Optics	3	PHY	F241	Electromagnetic Theory II	4
	PHY	F214	Electricity, Magnetism & Optics Laboratory	2	PHY	F242	Quantum Mechanics I	3
			Humanities Elective	3	PHY	F243	Mathematical Methods of Physics	3
	BITS	F225	Environmental Studies	3	PHY	F244	Modern Physics Laboratory	2
							Humanities Electives	5
				21				**20**
Summer	**BITS F221 Practice School -1(for PS Option Only)**							
III	**First Semester**			**U**	**Second Semester**			**U**
	PHY	F311	Quantum Mechanics II	3	PHY	F341	Solid State Physics	3
	PHY	F312	Statistical Mechanics	3	PHY	F342	Atomic & Molecular Physics	3
	PHY	F313	Computational Physics	3	PHY	F343	Nuclear & Particle Physics	3
	CE	F211	Mechanics of Solids	3	CE	F241	Analysis of structures	3
	CE	F231	Fluid Mechanics	**3**	CE	F242	Construction Planning & Technology	3
	CE	F230	Civil Engineering Materials	**4**	CE	F243	Soil Mechanics	4
	CE	F213	Surveying	4	CE	F244	Highway Engineering	4
				23				**23**
IV	**First Semester**			**U**	**Second Semester**			**U**
	CE	**F320**	**Design of Reinforced Concrete Structures**	**3**	CE	F342	Water & Waste Water Treatment	4
	CE	F312	Hydraulic Engineering	4	**CE**	**F321**	**Engineering Hydrology**	**3**
	CE	F313	Foundation Engineering	3				
			First Discipline Electives	9	CE	F343	Design of Steel Structures	3
			Second Discipline Electives	3	PHY	F344	Advanced Physics Laboratory	3
							First Discipline Electives	6
							Second Discipline Electives	3
				22				**22**
V	**First Semester**			**U**	**Second Semester**			**U**
	Second Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from **August 2017** onwards.

Semester-wise pattern for composite Dual Degree Programmes
(M.Sc. Physics with B.E. Computer Science)

Year	First Semester			U	Second Semester			U
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	PHY	F211	Classical Mechanics	4			or	
	PHY	F212	Electromagnetic Theory I	3	MGTS	F211	Principles of Management	3
	PHY	F213	Optics	3	PHY	F241	Electromagnetic Theory II	4
II	PHY	F214	Electricity, Magnetism &		PHY	F242	Quantum Mechanics I	3
			Optics Laboratory	2	PHY	F243	Mathematical Methods of	
			Humanities Elective	3			Physics	3
	BITS	F225	Environmental Studies	3	PHY	F244	Modern Physics Laboratory	2
							Humanities Electives	5
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
	PHY	F311	Quantum Mechanics II	3	PHY	F341	Solid State Physics	3
	PHY	F312	Statistical Mechanics	3	PHY	F342	Atomic & Molecular Physics	3
	PHY	F313	Computational Physics	3	PHY	F343	Nuclear & Particle Physics	3
	CS	F215	Digital Design	4	PHY	F344	Advanced Physics	
	CS	F214	Logic in Computer				Laboratory	3
III			Science	3	CS	F241	Microprocessors &	
	CS	F222	Discrete Structures For				Interfacing	4
			Computer Science	3	CS	F212	Database Systems	4
	CS	F213	Object Oriented		CS	F211	Data Structures & Algorithms	4
			Programming	4				
				23				**24**
	First Semester			**U**	**Second Semester**			**U**
	CS	F351	Theory of Computation	3	CS	F363	Compiler Construction	3
	CS	F372	Operating Systems	3	CS	F364	Design and Analysis of	
	CS	F342	Computer Architecture	4			Algorithms	3
IV	CS	F301	Principles of		CS	F303	Computer Networks	4
			Programming Languages	2			First Discipline Electives	9
			First Discipline Electives	6			Second Discipline Electives	3
			Second Discipline Electives	3				
				21				**22**
	First Semester			**U**	**Second Semester**			**U**
V	Second Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Physics with B.E. Electrical & Electronics)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	PHY	F211	Classical Mechanics	4			or	
	PHY	F212	Electromagnetic Theory I	3	MGTS	F211	Principles of Management	3
	PHY	F213	Optics	3	PHY	F241	Electromagnetic Theory II	4
	PHY	F214	Electricity, Magnetism &Optics Laboratory	2	PHY	F242	Quantum Mechanics I	3
			Humanities Elective	3	PHY	F243	Mathematical Methods of Physics	3
	BITS	F225	Environmental Studies	3	PHY	F244	Modern Physics Laboratory	2
							Humanities Electives	5
				21				**20**
Summer	**BITS F221 Practice School -1(for PS Option Only)**							
III	**First Semester**			**U**	**Second Semester**			**U**
	PHY	F311	Quantum Mechanics II	3	PHY	F341	Solid State Physics	3
	PHY	F312	Statistical Mechanics	3	PHY	F342	Atomic & Molecular Physics	3
	PHY	F313	Computational Physics	3	PHY	F343	Nuclear & Particle Physics	3
	EEE	F211	Electrical Machines	4	EEE	F243	Signals and Systems	3
	EEE	F214	Electronic Devices	3	EEE	F244	Microelectronic Circuits	3
	EEE	F215	Digital Design	4	EEE	F241	Microprocessors & Interfacing	4
					EEE	F242	Control Systems	3
				20				**22**
IV	**First Semester**			**U**	**Second Semester**			**U**
	EEE	F311	Communication Systems	4	EEE	F341	Analog Electronics	4
	MATH	F212	Optimization	3	EEE	F342	Power Electronics	4
			or		EEE	F312	Power Systems	3
	ME	F344	Engineering Optimization	2	PHY	F344	Advanced Physics Laboratory	3
	EEE	F313	Analog & Digital VLSI Design	3			First Discipline Electives	6
			First Discipline Electives	9			Second Discipline Electives	4
			Second Discipline Electives	5				
				23/24				**24**
V	**First Semester**			**U**	**Second Semester**			**U**
	Second Discipline Electives			3	BITS F412 Practice School - II			20
	BITS F423T		Thesis	9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Physics with B.E. Electronics & Communication)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	PHY	F211	Classical Mechanics	4			or	
	PHY	F212	Electromagnetic Theory I	3	MGTS	F211	Principles of Management	3
	PHY	F213	Optics	3	PHY	F241	Electromagnetic Theory II	4
	PHY	F214	Electricity, Magnetism & Optics Laboratory	2	PHY	F242	Quantum Mechanics I	3
			Humanities Elective	3	PHY	F243	Mathematical Methods of Physics	3
	BITS	F225	Environmental Studies	3	PHY	F244	Modern Physics Laboratory	2
							Humanities Electives	5
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
III	PHY	F311	Quantum Mechanics II	3	PHY	F341	Solid State Physics	3
	PHY	F312	Statistical Mechanics	3	PHY	F342	Atomic & Molecular Physics	3
	PHY	F313	Computational Physics	3	PHY	F343	Nuclear & Particle Physics	3
	ECE	F215	Digital Design	4	ECE	F241	Microprocessors & Interfacing	4
	ECE	F211	Electrical Machines	4	ECE	F242	Control Systems	3
	ECE	F214	Electronic Devices	3	ECE	F243	Signals and Systems	3
					ECE	F244	Microelectronic Circuits	3
				20				**22**
	First Semester			**U**	**Second Semester**			**U**
IV	ECE	F311	Communication Systems	4	ECE	F341	Analog Electronics	4
	ECE	F434	Digital Signal Processing	4	ECE	F344	Information Theory & Coding	3
	ECE	F314	Electromagnetic Fields & Microwave Engineering	3	ECE	F343	Communication Networks	3
			First Discipline Electives	9	PHY	F344	Advanced Physics Laboratory	3
			Second Discipline Electives	3			First Discipline Electives	6
							Second Discipline Electives	5
				23				**24**
	First Semester			**U**	**Second Semester**			**U**
V	Second Discipline Electives			4	BITS F412 Practice School - II			20
	BITS F423T		Thesis	9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Physics with B.E. Electronics & Instrumentation)									
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	PHY	F211	Classical Mechanics	4			or	
	PHY	F212	Electromagnetic Theory I	3	MGTS	F211	Principles of Management	3
	PHY	F213	Optics	3	PHY	F241	Electromagnetic Theory II	4
	PHY	F214	Electricity, Magnetism &Optics Laboratory	2	PHY	F242	Quantum Mechanics I	3
			Humanities Elective	3	PHY	F243	Mathematical Methods of Physics	3
	BITS	F225	Environmental Studies	3	PHY	F244	Modern Physics Laboratory	2
							Humanities Electives	5
				21				**20**
Summer	**BITS F221 Practice School -1(for PS Option Only)**							
III	**First Semester**			**U**	**Second Semester**			**U**
	PHY	F311	Quantum Mechanics II	3	PHY	F341	Solid State Physics	3
	PHY	F312	Statistical Mechanics	3	PHY	F342	Atomic & Molecular Physics	3
	PHY	F313	Computational Physics	3	PHY	F343	Nuclear & Particle Physics	3
	INSTR	F215	Digital Design	4	INSTR	F241	Microprocessors & Interfacing	4
	INSTR	F211	Electrical Machines	4	INSTR	F242	Control Systems	3
	INSTR	F214	Electronic Devices	3	INSTR	F243	Signals & Systems	3
					INSTR	F244	Microelectronic Circuits	3
				20				**22**
IV	**First Semester**			**U**	**Second Semester**			**U**
	INSTR	F311	Electronic Instruments & Instrumentation Technology	4	INSTR	F341	Analog Electronics	4
	INSTR	F312	Transducers and Measurement Systems	3	INSTR	F342	Power Electronics	4
	INSTR	F313	Analog & Digital VLSI Design	3	INSTR	F343	Industrial Instrumentation & Control	3
			First Discipline Electives	9	PHY	F344	Advanced Physics Laboratory	3
			Second Discipline Electives	3			First Discipline Electives	6
							Second Discipline Electives	4
				22				**24**
V	**First Semester**			**U**	**Second Semester**			**U**
	Second Discipline Electives			5	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2011 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Physics with B.E. Manufacturing)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
II	**First Semester**			**U**	**Second Semester**			**U**
	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	PHY	F211	Classical Mechanics	4			or	
	PHY	F212	Electromagnetic Theory I	3	MGTS	F211	Principles of Management	3
	PHY	F213	Optics	3	PHY	F241	Electromagnetic Theory II	4
	PHY	F214	Electricity, Magnetism &Optics Laboratory	2	PHY	F242	Quantum Mechanics I	3
			Humanities Elective	3	PHY	F243	Mathematical Methods of Physics	3
	BITS	F225	Environmental Studies	3	PHY	F244	Modern Physics Laboratory	2
							Humanities Electives	5
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
III	**First Semester**			**U**	**Second Semester**			**U**
	PHY	F311	Quantum Mechanics II	3	PHY	F341	Solid State Physics	3
	PHY	F312	Statistical Mechanics	3	PHY	F342	Atomic & Molecular Physics	3
	PHY	F313	Computational Physics	3	PHY	F343	Nuclear & Particle Physics	3
	MF	F211	Mechanics of Solids	3	PHY	F344	Advanced Physics Laboratory	3
	MF	F216	Materials Science & Engineering	3	MF	F219	Operations Management	3
	MF	F217	Machine Drawing	2	MF	F220	Metrology and Quality Assurance	3
	MF	F218	Transport Phenomena in Manufacturing	4	MF	F221	Mechanisms and Machines	3
					MF	F222	Casting, Forming and Welding	4
				21				**25**
IV	**First Semester**			**U**	**Second Semester**			**U**
	MF	F314	Design of Machine Elements	3	MF	F317	Computer Aided Design and Manufacturing	3
	MF	F315	Automation and Control	4	MF	F318	Non Traditional Manufacturing Processes	3
	MF	F316	Machining and Machine Tools	4	MF	F319	Supply Chain Management	3
			First Discipline Electives	9	MF	F320	Engineering Optimization	3
			Second Discipline Electives	3			First Discipline Electives	6
							Second Discipline Electives	4
				23				**22**
V	**First Semester**			**U**	**Second Semester**			**U**
	Second Discipline Electives			5	BITS F412 Practice School - II			20
	BITS F423T Thesis			9				

Note: This is operative pattern for the students who are admitted from August 2019 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

Semester-wise pattern for composite Dual Degree Programmes (M.Sc. Physics with B.E. Mechanical)								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	**Same as First degree Programme**				**Same as First degree Programme**			
	First Semester			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	PHY	F211	Classical Mechanics	4			or	
	PHY	F212	Electromagnetic Theory I	3	MGTS	F211	Principles of Management	3
	PHY	F213	Optics	3	PHY	F241	Electromagnetic Theory II	4
	PHY	F214	Electricity, Magnetism & Optics Laboratory	2	PHY	F242	Quantum Mechanics I	3
			Humanities Elective	3	PHY	F243	Mathematical Methods of Physics	3
	BITS	F225	Environmental Studies	3	PHY	F244	Modern Physics Laboratory	2
							Humanities Electives	5
				21				**20**
Summer	**BITS F221 Practice School -1 (for PS Option Only)**							
	First Semester			**U**	**Second Semester**			**U**
III	PHY	F311	Quantum Mechanics II	3	PHY	F341	Solid State Physics	3
	PHY	F312	Statistical Mechanics	3	PHY	F342	Atomic & Molecular Physics	3
	PHY	F313	Computational Physics	3	PHY	F343	Nuclear & Particle Physics	3
	ME	F211	Mechanics of Solids	3	PHY	F344	Advanced Physics Laboratory	3
	ME	F212	Fluid Mechanics	3	ME	F218	Advanced Mechanics of Solids	2
	ME	F216	Materials Science & Engineering	3	ME	F219	Manufacturing Processes	4
	ME	F217	Applied Thermodynamics	4	ME	F220	Heat Transfer	4
					ME	F221	Mechanisms and Machines	3
				22				**25**
	First Semester			**U**	**Second Semester**			**U**
IV	ME	F314	Design of Machine Elements	3	ME	F318	Computer-Aided Design	3
	ME	F315	Advanced Manufacturing Processes	3	ME	F319	Vibrations & Control	3
	ME	F316	Manufacturing Management	2	ME	F320	Engineering Optimization	3
	ME	F317	Engines, Motors, and Mobility	2	ME	F341	Prime Movers & Fluid Machines	3
			First Discipline Electives	9			First Discipline Electives	6
			Second Discipline Electives	3			Second Discipline Electives	3
				22				**21**
	First Semester			**U**	**Second Semester**			**U**
V	Second Discipline Electives			6	BITS F412 Practice School - II			20
	BITS F423T		Thesis	9				

Note: This is operative pattern for the students who are admitted from August 2019 onwards as approved by the Senate-appointed committee, subject to change if the situation warrants.

MINOR PROGRAMMES FOR FIRST DEGREE STUDENTS

"Minor programs" are offered as options for first degree students with the intent of encouraging them to add focus to their supplemental learning (outside a major area) as well as recognizing and certifying the knowledge obtained in an area that is outside of their major area.

General Guidelines

- A minor would allow a Department (or multiple Departments) to offer a package of courses in an area/sub-area to students for whom this area/sub-area would not be part of their (major) program.
- A minor option would allow a student to pursue the study of an area or a sub-area through a set of courses but not as exhaustively as required to obtain a degree (i.e. a major) in that area.
- A minor may be inter-disciplinary (e.g. a minor in Computational Science may include courses in Numerical Analysis, Computational Physics, Computational Chemistry, and Bioinformatics among others).
- A minor will be recognized by means of a separate certificate.

Requirements for a minor

- Courses and Units Requirement:

  Each minor would be defined by coursework requirement with the following conditions:

Category	Courses	Units
Minor – Core	4 (max)	12 (max)
Minor – Electives	2 (min)	6 (min)
Minor – Total	5 (min)	15 (min)

- Elective Pool:

  - The pool of electives specific to a minor may include courses from one or more disciplines and may include project / seminar type courses.
  - A student may use at most one project / seminar type course to meet the requirements of a minor.

- Overlap in requirements:

  - At most 2 courses (and at most 6 units) out of the above requirement (of 5 courses and 15 units) may be met by mandatory courses of the student's degree i.e. major (or degrees i.e. majors) :

    i.e. from the general institutional requirement (excluding Humanities requirement) or the (Major) discipline Core(s).

  - There is no restriction of overlap requirement on electives (i.e. discipline elective or open elective or humanities elective).
  - No course may be used to meet the requirements of two different minors nor may a course be used to the meet the requirements of two majors and a minor.

- GPA requirement:
  - A student – on completion of the requirements for a minor – must have maintained a cumulative GPA of 4.5 or above (out of 10) in the courses applied to the minor.

Process for declaring / obtaining a minor

- A student – if he/she chooses to pursue a minor – must declare at the end of the 2nd year that he/she will pursue a specific minor. The student will charged a small fee for logistics.
- If and when he/she completes the requirements for the minor – as stipulated above and as stipulated for the specific minor, then he/she may apply for a "minor" certificate.
- If it is verified that the requirements are met then he/she will be awarded a "minor certificate" (separate from a degree – i.e. major – certificate).
- A minor certificate will be issued only on completion of a degree (i.e. a major).

At present Sixteen minor programs viz. Minor in Aeronautics, Computational Economics, Computing and Intelligence, Data Science, English Studies, Entrepreneurship, Film and Media, Finance, Management, Materials Science and Engineering, Philosophy, Economics and Politics (PEP), Physics, Public Policy, Robotics and Automation, Supply Chain Analytics and Water and Sanitation have been designed. The details of which are given below:

Minor in Aeronautics					
Description	Aeronautics is an exhilarating field encompassing the fundamentals of aerodynamics (interaction of air with objects in motion), propulsion (power systems responsible for the generation of thrust for providing motion), structures (design of airframes and material characteristics), and flight mechanics (trajectory study and optimization), as applied to air-borne vehicles within the Earth's atmosphere, and to rockets and spacecrafts outside.				
Courses & Units Req.	06 courses (min) 18 units (min)				
Core Courses	**Course Number**	**Course Title**	**L**	**P**	**U**
	AN F311	Principles of Aerodynamics	3	0	3
	AN F312	Aircraft Propulsion	3	0	3
	AN F313	Flight Mechanics and Controls	3	0	3
Electives	AN F314	Introduction to Flight	3	0	3
	AN F315	Aircraft Structures	3	0	3
	ME F415	Gas Dynamics	3	0	3
	ME F418	Rocket and Spacecraft Propulsion	3	0	3
	ME F452	Composite Materials and Design	3	0	3
	ME F482	Combustion	3	0	3
	ME F485	Numerical Techniques for Fluid Flow & Heat Transfer	3	0	3
	EEE F242	Control Systems	3	0	3
	EEE F417	Computer Based Control Systems	3	0	3
	ME F376	Design Project			3

Minor in Computational Economics					
Description	The joint field of economics, mathematics, and computer science have emerged from converging intellectual needs for interdisciplinary teaching and research. The contemporary tools and techniques used by computer scientists have become increasingly important for economists working with data to address complex business problems. Students interested in learning about computational mechanism design with applications to economics and especially those whose interest is more generally focused on data analytics will be highly benefitted from this programme. This programme is designed to cater to the needs of the cutting-edge industry thereby combining advanced computational tools with economic reasoning. It would help students to develop a deep background in advanced tools for analysis of economic data, which is essential for making sound economic decisions. The programme combines the strengths of multiple departments to educate students in these important computational skills linked to economics, and to prepare them for careers in economics, finance, and business. Reflecting on this strong interdisciplinary relationship, this programme will also be excellent preparation for graduate study in economics or decision sciences.				
Courses & Units Req.	**05 courses (min)** **15 units (min)**				
	Course Number	**Course Title**	L	P	U
Core Courses	ECON F215	Computational Methods for Economics	3	0	3
	ECON F241	Econometric Methods	3	0	3
	ECON F242	Microeconomics	3	0	3
Electives	BITS F314	Game Theory and its Applications	3	0	3
	BITS F464	Machine Learning	3	0	3
	CS F320	Foundations of Data Science	3	0	3
	ECON F342	Applied Econometrics	3	0	3
	ECON F419	Advanced Microeconomics	3	0	3
	ECON F420	Applied Macroeconometrics	3	0	3
	MATH F424	Applied Stochastic Process	3	1	4

Minor in Computing and Intelligence					
Description	The Minor in Computing and Intelligence aims to enable the students majoring in disciplines other than Computer Science to gain a deeper understanding of computing and artificial intelligence and apply the same in solving problems in diverse domains. While courses like Foundations of Data Structures and Algorithms would help the students with abstract thinking and problem solving, courses like Operating Systems, Artificial Intelligence etc., will give them exposure to the fundamental aspects of computing and intelligent systems. This minor programme is exclusively designed for first-degree students of non-Computer Science disciplines.				
Courses & Units Required	**06 courses (min)** **18 units (min)**				
	Course Number	**Course Title**	L	P	U
Core Courses	BITS F232	Foundations of Data Structures and Algorithms	3	1	4
	CS F372	Operating Systems	3	0	3
	CS F407	Artificial intelligence	3	0	3
	BITS F311	Image Processing	3	0	3

Minor in Computing and Intelligence					
Electives	BITS F452	Blockchain Technology	3	0	3
	BITS F463	Cryptography	3	0	3
	BITS F464	Machine Learning	3	0	3
	CS F212	Database Systems	3	1	4
	CS F213	Object Oriented Programming	3	1	4
	CS F301	Principles of Programming Languages	2	0	2
	CS F303	Computer Networks	3	1	4
	CS F314	Software Development for Portable Devices	2	1	3
	CS F315	Information and Communication Technologies and Development	3	0	3
	CS F415	Data Mining	3	0	3
	IS F311	Computer Graphics	3	0	3
	IS F341	Software Engineering	3	1	4

Minor in Data Science					
Description	The minor in Data Science aims to enable students to learn the basic skills required by Data Scientist for today's world. Data Science is becoming ubiquitous to all kinds of industry and opening up new avenues of business. This minor will help students to apply knowledge from Mathematics, Statistics and Computing for analyzing data collected from different kinds of sources in their respective engineering applications and make meaningful and actionable insights.				
Courses & Units Required	5 courses (min) 15 units (min)				
Core Courses	**Course Number**	**Course Title**	**L**	**P**	**U**
	BITS F464	Machine Learning	3	0	3
	CS F320	Foundations of Data Science	3	0	3
	MATH F432	Applied statistical Methods	3	0	3
Electives	BITS F453	Computational Learning Theory	3	0	3
	BITS F454	Bio-Inspired Intelligence: Algorithms and Applications	3	0	3
	CS F317	Reinforcement Learning	3	0	3
	CS F407	Artificial Intelligence	3	0	3
	CS F415	Data Mining	3	0	3
	CS F425	Deep Learning	3	0	3
	CS F426	Graph Mining	3	1	4
	CS F429	Natural Language Processing	3	0	3
	CS F432	Brain-inspired Deep Learning	3	0	3
	CS F433	Computational Neuroscience	3	0	3
	CS F469	Information Retrieval	3	0	3
	CS G519	Social Media Analytics	3	1	4
	MATH F212	Optimization	3	0	3
	MATH F353	Statistical Inference and applications	3	0	3
	MATH F424	Applied Stochastic Processes	3	1	4

Minor in Data Science					
	MATH F471	Nonlinear Optimization	3	0	3

Minor in English Studies					
Description	English has a rich linguistic, literary and cultural heritage. The classic literary masterpieces of English are still widely read and appreciated. English has also evolved over centuries and is now considered as the pre-eminent means of communication in the various sectors such as business, diplomacy, mass media, education, etc., across the globe. The Minor in English Studies introduces students to the language and literary canons, and renders them with adequate exposure not only to the cultural and linguistic aspects but also to practical applications of English language and literature. In particular, the core and elective courses included in the Minor would encourage students to acquire a critical understanding of literary and linguistic analyses, and the capacity to engage meaningfully in analysis, interpretation, and explanation. The Minor also gives an opportunity for students to choose modules and develop their own interests in language or literature. Students who follow the Minor will have an enhanced understanding of the nature of the English language and literature and also of the tools needed for further independent exploration of literary and linguistic phenomena.				
Courses & Units Required	5 courses (min) 15 units (min)				
Core Courses	**Course Number**	**Course Title**	**L**	**P**	**U**
	GS F241	Creative Writing	2	1	3
	HSS F337	English Literary Forms and Movements	3	0	3
Electives Pool – I (Language)	GS F221	Business Communication	3	0	3
	GS F244	Reporting and Writing for Media	3	0	3
	GS F245	Effective Public Speaking	3	0	3
	HSS F222	Linguistics	3	0	3
	HSS F227	Cross Cultural Skills	3	0	3
	HSS F228	Phonetics and Spoken English	3	0	3
	HSS F342	Advanced Communicative English	3	0	3
Elective Pool-II (Literature)	GS F242	Cultural Studies	3	0	3
	GS F322	Critical Analysis of Literature and Cinema	3	0	3
	HSS F221	Readings from Drama	3	0	3
	HSS F226	Postmodernism	3	0	3
	HSS F237	Contemporary Indian English Fiction	3	0	3
	HSS F316	Popular Literature and Culture of South Asia	3	0	3
	HSS F327	Contemporary Drama	3	0	3
	HSS F330	Appreciation of Art	3	0	3
	HSS F332	Cinematic Arts	3	0	3
	HSS F335	Literary Criticism	3	0	3
	HSS F336	Modern Fiction	3	0	3
	HSS F338	Comparative Indian Literature	3	0	3
	HSS F340	Postcolonial Literatures	3	0	3
	HSS F349	Ecocriticism	3	0	3

Minor in English Studies					
	HSS F373	Shakespeare and Popular Culture	3	0	3
	HSS F399	Introduction to American Literature	3	0	3

Minor in Entrepreneurship					
Description	Entrepreneurship has tremendous impact on development of economy as well as society addressing various market & societal problems through continuous value creation in terms of innovations and job creation. The minor in entrepreneurship aims to equip students from different disciplines with better understanding of entrepreneurial process, necessary skills and experience to translate ideas into real innovative products/services to new entrepreneurial ventures. In this programme, hands-on experiential learning is emphasized giving students an opportunity to learn in a team environment, design innovative products/services and create their own businesses. This will motivate students to pursue entrepreneurship as their career choice.				
Courses & Units Required	**5 courses (min)** **15 units (min)**				
Core Courses	**Course Number**	**Course Title**	**L**	**P**	**U**
	BITS F468	New Venture Creation	3	0	3
	BITS F482 or ECON F414	Creating and Leading Entrepreneurial Organizations	3	0	3
	ECON F212	Fundamentals of Finance and Accounting	3	0	3
Electives (minimum of 2 courses and additional units required to make the total to 15)	BITS F322	Venture Team Development and Organization	3	0	3
	BITS F323	Venture Finance	3	0	3
	BITS F324	Strategy for Entrepreneurs	3	0	3
	BITS F325	New Product and Service Design	3	0	3
	BITS F326	Design Thinking for Innovation & Entrepreneurship	3	0	3
	BITS F427	Digital Marketing	3	0	3

Minor in Film and Media					
Description	Film and its derivative forms of media such as television and advertising are dominant cultural forces in the contemporary world. The minor in Film and Media aims to provide: i. An introduction to media studies with a specific focus on film studies ii. A basic introduction to Print and Digital Media including film making and film appreciation iii. Hands-on training in writing for media and film production				
Courses & Units Required	6 courses (min) 18 units (min)				
Core Courses	**Course number**	**Course Title**	**L**	**P**	**U**
	GS F223	Introduction to Mass Communication	3	0	3
	GS F244	Reporting and Writing for Media	3	0	3
	GS F322	Critical Analysis of Literature and Cinema	3	0	3
Elective Courses	GS F224	Print and Audio Visual Advertising	3	0	3
	GS F242	Cultural Studies	3	0	3
	GS F321	Mass Media Content and Design	3	0	3
	GS F343	Short Film and Video Production	3	0	3

Minor in Film and Media					
	HSS F332	Cinematic Arts	3	0	3

Minor in Finance					
Description	The minor in Finance aims at providing the student a grounding in the basic concepts of accounting and finance so as to complement their existing disciplinary knowledge, enrich their educational experience, enable them to make better financial decisions, and expand their career opportunities. It will also give students an opportunity to learn more about investments and quantitative applications in finance.				
Courses & Units Required	5 courses (min) 15 units (min)				
Core Courses	**Course Number**	**Course Title**	**L**	**P**	**U**
	ECON F212	Fundamentals of Finance and Accounting	3	0	3
	FIN F315	Financial Management	3	0	3
Elective Courses	ECON F241	Econometric methods	3	0	3
	ECON F312	Money banking and Financial markets	3	0	3
	ECON F355	Business Analysis & Valuation	3	0	3
	ECON F411	Project Appraisal	3	0	3
	ECON F413	Financial Engineering	3	0	3
	FIN F242	Introduction to Financial Mathematics	3	0	3
	FIN F243	Functions & Working of Stock Exchanges	3	0	3
	FIN F311	Derivatives & Risk Management	3	0	3
	FIN F312	Fundamentals of Taxation and Audit	3	0	3
	FIN F313	Security Analysis & Portfolio Management	3	0	3
	FIN F314	Investment Banking & Financial Services	3	0	3
	FIN F414	Financial Risk Analytics and Management	3	0	3

Minor in Management					
Description	"Minor in Management" is designed for the student who wants a general introduction to the functioning of a business and develops a business acumen. By gaining an understanding of the areas of management, the student will have a competitive advantage in the marketplace and throughout their career. The student shall be better equipped to handle their projects in practice school by understanding organizational and managerial issues. It would also enable him/her to combine their technical and managerial skills and explore the field of business consulting, role of management trainees, etc. Those interested in pursuing an MBA would get an opportunity to explore the management field and assess its fit with their career interest.				
Courses & Units Required	**05 courses (min)** **15 units (min)**				
Core Courses	**Course Number**	**Course Title**	L	P	U
	BITS F428	Essentials of Strategic Management	3	0	3
	MGTS F211	Principles of Management	3	0	3
	MGTS F314	Essentials of Financial Management	3	0	3
	BITS F326	Design Thinking for Innovation and Entrepreneurship	3	0	3

Minor in Management					
Electives	ECON F415	New Venture Creation	3	0	3
	ECON F434	International Business	3	0	3
	ECON F435	Marketing Research	3	0	3
	HSS F328	Human Resources Development	3	0	3
	MF F219	Operations Management	3	0	3
	MF F319	Supply Chain Management	3	0	3
	ME F443	Quality Control, Assurance and Reliability	3	0	3
	MGTS F311	Marketing	3	0	3
	MGTS F313	Product and Brand Management	3	0	3
	MGTS F315	Foundations of Business Analytics	3	0	3
	MGTS F316	Managerial and Leadership Skills	3	0	3
	MGTS F351	Organizational Behaviour	3	0	3

Minor in Materials Science and Engineering					
Description	Materials Science and Engineering is an interdisciplinary subject that makes use of knowledge from Physics, Chemistry, Engineering, Mathematics, Biology and Biotechnology, but which has its own special character. It is always evolving – new and exciting materials such as nanomaterials, high-temperature and lightweight materials, green materials and sustainable biomaterials for tissue engineering are continually emerging. The field of Material Science combines a wide knowledge base and puts it to diverse practical and commercial use.				
Courses & Units Required	5 courses (min) 15 units (min)				
Core Courses	**Course Number**	**Course Title**	**L**	**P**	**U**
	CHE F243 / ME F213	Materials Science and Engineering	3 2	0 0	3 2
	MST F331	Materials Characterization	3	1	4
	MST F332	Materials Processing	3	0	3
Elective Courses	BITS F416	Introduction to Nanoscience	3	0	3
	CHE F433	Corrosion Engineering	3	0	3
	CHEM F223	Colloid and Surface Chemistry	3	0	3
	CHEM F326	Solid State Chemistry	3	0	3
	CHEM F336	Nanochemistry	3	1	4
	ME F452	Composite Materials and Design	3	0	3
	MST F333	Introduction to Biomaterials	3	0	3
	MST F334	Materials for Catalytic Applications	3	0	3

Minor in Materials Science and Engineering					
	MST F335	Coating and thin film technology	3	0	3
	MST F336	Glass Technology	3	0	3
	MST F337	Materials for Energy Applications	3	0	3
	MST F338	Metals and Alloys	3	0	3
	MST F339	Polymer Materials	3	0	3
	PHY F379	Thin Film Technology	3	0	3
	PHY F414	Physics of Advanced Materials	3	1	4
	PHY F416	Soft condensed Matter Physics	3	1	4

Minor in Philosophy, Economics, and Politics					
Description	The minor in *Philosophy, Economics & Politics & (PEP)* aims at introducing students to a wide range of approaches to understand the social and human world we live in and to develop skills useful for a range of career opportunities in national and international organizations. It would particularly interest and enthuse those students who wish to complement their core expertise in science and engineering with a good grasp of the humanities and social sciences. As a multi-disciplinary minor, this option will provide a judicious mix of knowledge in social sciences (economics, sociology and politics) and the humanities (philosophy) that would enable students to draw connections among political, economic, and social phenomena as well as equip them with the necessary skills to think through complex challenges of our society in a creative and critical manner.				
Courses & Units Required	6 courses (min) 18 units (min)				
Core Courses	**Course Number**	**Course Title**	**L**	**P**	**U**
	ECON F211	Principles of Economics	3	0	3
	GS F211	Modern Political Concepts	3	0	3
	HSS F235	Introductory Philosophy	3	0	3
Elective Courses	BITS F 385	Introduction to Gender Studies	3	0	3
	GS F231	Dynamics of Social Change	3	0	3
	GS F234	Development Economics	3	0	3
	GS F243	Current Affairs	3	0	3
	GS F312	Applied Philosophy	3	0	3
	GS F313	Marxian Thoughts	3	0	3
	GS F332	Contemporary India	3	0	3
	GS F333	Public Administration	3	0	3
	HSS F236	Symbolic Logic	3	0	3
	HSS F315	Society, Business, and Politics	3	0	3
	HSS F322	Social and Political Ecology	3	0	3
	HSS F331	Sankara's Thoughts	3	0	3
	HSS F333	Comparative Religion	3	0	3
	HSS F343	Professional Ethics	3	0	3

Minor in Philosophy, Economics, and Politics					
	HSS F345	Gandhian Thoughts	3	0	3
	HSS F346	International Relations	3	0	3
	HSS F350	Human Rights: History, Theory and Practice	3	0	3
	HSS F353	Philosophy of Aesthetics	3	0	3
	HSS F354	Introduction to Islamic Economy	3	0	3
	HSS F355	Dictatorship, Democracy & Development	3	0	3
	HSS F356	Social Movements and Protest Politics	3	0	3

Minor in Physics					
Description	The theories in physics are all-pervading and their applications are found in varied branches of engineering and sciences. The minor in Physics aims to introduce the student to fundamental theories in physics. The core courses cover the basics and by choosing from the large pool of electives, the student will be able to pursue to a deeper level the areas of her/his interest. This minor would equip the students with the skill and knowledge which will help them in gaining insights in their own primary area of study.				
Courses & Units Required	5 courses (min) 15 units (min)				
Core Courses	**Course Number**	**Course Title**	**L**	**P**	**U**
	PHY F212 **or** ECE F212/ EEE F212/ INSTR F212	Electromagnetic Theory – 1 **or** Electromagnetic Theory	3	0	3
	PHY F242	Quantum Mechanics – 1	3	0	3
	PHY F312	Statistical Mechanics	3	0	3
Elective Courses	BITS F316	Nonlinear Dynamics and Chaos	3	0	3
	BITS F386	Quantum Information and Computing	3	0	3
	PHY F211	Classical Mechanics	3	1	4
	PHY F213	Optics	3	0	3
	PHY F214	Electricity Magnetism and Optics Lab	0	2	2
	PHY F215	Introduction to Astronomy and Astrophysics	3	0	3
	PHY F241	Electromagnetic Theory – 2	3	1	4
	PHY F243	Mathematical Method of Physics	3	0	3
	PHY F244	Modern Physics Lab	0	2	2
	PHY F311	Quantum Mechanics – 2	3	0	3
	PHY F313	Computational Physics	3	0	3
	PHY F315	Theory of Relativity	3	0	3
	PHY F341	Solid State Physics	3	0	3
	PHY F342	Atomic and Molecular Physics	3	0	3

Minor in Physics					
	PHY F343	Nuclear and Particle Physics	3	0	3
	PHY F346	Laser Science and Technology	3	0	3
	PHY F418	Lasers and Applications	3	1	4
	PHY F426	Physics of Semiconductors Devices	3	1	4
	PHY F427	Atmospheric Physics	3	0	3
	PHY F428	Quantum Information Theory	3	0	3

Minor in Public Policy					
Description	The Minor in Public Policy aims at providing the students a clear and contextualised understanding of conceptual and empirical aspects of public policy, the nature of public policy interventions in India and their varying impacts. Also, it intends to provide the students an understanding of the dynamics of policymaking, central aspects of governance and core features and functions of institutions, and equip them with skills of policy analysis.				
Courses & Units Required	5 courses (min) 15 units (min)				
Core Courses	**Course Number**	**Course Title**	**L**	**P**	**U**
	GS F233	Public Policy	3	0	3
	GS F333	Public Administration	3	0	3
Elective Courses	HSS F232	Introduction to Development Studies	3	0	3
	HSS F317	Introduction to Globalisation	3	0	3
	HSS F322	Social and Political Ecology	3	0	3
	HSS F361	Urban Policy and Governance	3	0	3
	HSS F362	Local Governance and Participation	3	0	3

Minor in Robotics and Automation	
Description	This minor aims to impart specialized knowledge and skills in robotics and automation required by engineers to the current demands of various industrial sectors. Automobile, aerospace & defense, logistics engineering and factory automation companies are currently asking for engineering graduates with add-on skills in these areas. Feedback has established that several sectors of industry need the newly recruited employees with knowledge and skills in 'automation', 'robotics', and 'mechatronics'. Currently, the need of core courses of any B.E. programme of the Institute limits sufficient coverage of these topics in the existing core and hence the only way students can complement their learning with these specialized courses is through a minor programme. This minor programme has been designed by keeping that need in focus. This minor programme consists of a fairly generic core so as to be relevant to students of any discipline and a broad set of elective courses covering application of the fundamentals of robotics and automation to various industry sectors.
Courses & Units	05 courses (min) 15 units (min)

Minor in Robotics and Automation					
Required					
Core Courses	**Course Number**	**Course Title**	**L**	**P**	**U**
	BITS F441	Robotics	3	0	3
	EEE/INSTR/ECE F242	Control Systems	3	0	3
	BITS F327	Artificial Intelligence for Robotics	2	1	3
Electives	BITS F312	Neural Network & Fuzzy Logic	3	0	3
	BITS F415	Introduction To MEMS	3	1	4
	BITS F442	Remote Sensing and Image Processing	3	0	3
	BITS F464	Machine Learning	3	0	3
	ECE F434	Digital Signal Processing	3	1	4
	EEE F411	Internet of Things (IoT)	3	1	4
	EEE F422	Modern Control Systems	3	0	3
	EEE G512	Embedded System Design	3	1	4
	INSTR F343	Industrial Instrumentation and Control	3	0	3
	INSTR G611	Advanced Control Systems	3	2	5
	ME F244	Kinematics & Dynamics of Machinery	3	0	3
	ME F432	Computer Aided Manufacturing	2	1	3
	MF F311	Mechatronics & Automation	2	1	3
	MSE G511	Mechatronics	3	2	5

Minor in Supply Chain Analytics					
Description	Supply chain analytics help organizations to take better, faster and more informed decisions about their business operations. The global market for supply chain analytics is projected to exceed $10 billion by 2025 and has a compound annual growth rate (CAGR) of 16%. Today's supply chain analytics solutions already have impressive capabilities, and with future advancements will only become more of a game-changer for businesses across all industries. Supply chain analytics minor programme will enable the students to develop foundations and to broaden their knowledge base of supply chain in general and supply chain analytics in specific. It will cover three verticals such as supply chain management, supply chain modelling and empirical analysis (qualitative data analysis) & supply chain analytics (quantitative data analysis). The minor programme is designed to create supply chain professionals for present and future business environment.				
Courses & Units Required	**05 courses (min)** **15 units (min)**				
	Course Number	**Course Title**	L	P	U
	BITS F455	Analytics for Supply Chain	3	0	3
	MF F319	Supply Chain Management	3	0	3

Core Courses	MF F422	Supply Chain Modelling and Empirical Analysis	3	1	4
Electives	ME F443	Quality Control Assurance and Reliability	3	0	3
	MF F321	Procurement Management	3	0	3
	MF F418	Lean Manufacturing	3	0	3
	MF F485	Sustainable Manufacturing	3	0	3
	MATH F212 **OR** ME F320 **OR** MF F320	Optimization **OR** Engineering Optimization **OR** Engineering Optimization	3	0	3
	MATH F242	Operations Research	3	0	3
	MATH F353	Statistical Inference and Applications	3	0	3

Minor in Water and Sanitation					
Description	Sustainable Development Goal 6 (SDG 6) focusses on Water and Sanitation and the tasks mentioned in SDG 6. Sanitation is also high on agenda of the Indian Government as evident from Swachh Bharat Mission. Trained Postgraduate and working professionals are of high demand. Bill and Melinda Gates foundation had significantly invested in Water, Sanitation and Hygiene programme and they had funded UNESCO IHE and its 8 partners in developing e learning alliance. The foundation's investment strategy in sanitation requires qualified and trained professionals. This minor would equip the students with the skill and knowledge which will help them in gaining insights in the area of water and sanitation.				
Courses & Units Required	05 courses (min) 15 units (min)				
	Course Number	**Course Title**	L	P	U
Core Courses	BIO F216	Water Sanitation and Solid Waste Management	3	0	3
	BIO F217	Laboratory for Water Sanitation and Solid Waste management	1	2	3
Electives	BIO F266	Study Project			3
	SAN G511	Sanitation Technology	3	2	5
	SAN G512	Sanitation and Public Health	3	2	5
	SAN G513	Sanitation Governance Behaviour change and Advocacy			5*
	SAN G514	Sanitation Finance and Project Management			5*
	SAN G515	Emergency Sanitation & Leadership			5*

INTERNATIONAL COLLABORATION PROGRAMMES AT FIRST DEGREE LEVEL

The University Grants Commission (UGC) has approved regulations that allows Indian and foreign universities to offer twinning, joint and dual degrees in the same disciplines/subject areas and at the same qualification level (*The Gazzette of India, F.No.4-1/2022 (IC), UGC, New Delhi, Monday, May 2, 2022 as given in Annexure 3*). This is also in line with the Indian Government's commitment under the National Education Policy 2020. With the above regulations, UGC has created an arrangement where Indian universities which meet certain criteria will be able to develop and enter partnerships which would lead to the award of qualifications under the collaboration arrangements.

Accordingly, we are offering a few dual-degree programmes in collaboration with the foreign universities such as RMIT University, Melbourne, (Australia), Iowa State University, Ames (USA), and University at Buffalo (USA) in the same specialization and at the same qualification level at international level.

The partnership with these universities will include programmes spanning different academic disciplines that are desirable to students and expected to produce graduates who are in demand by industry and academia. Degrees will be awarded separately and simultaneously by the respective universities.

A. BITS-RMIT HIGHER EDUCATION ACADEMY

Prospective students are required to meet the admission requirements of both BITS Pilani, India, and the respective collaborating universities. Finally, students shall be awarded degrees in the same discipline and at the same level.

First Degree programmes being offered under this scheme are:

- B.E. Civil at BITS Pilani and Bachelor of Engineering (Civil and Infrastructure) (Honours) at RMIT, Australia
- B.E. Mechanical at BITS Pilani and Bachelor of Engineering (Mechanical) (Honours) at RMIT, Australia
- B.E. Electrical & Electronics at BITS Pilani and Bachelor of Engineering (Electrical Engineering) (Honours) at RMIT, Australia
- B.E. Electronics & Communication at BITS Pilani and Bachelor of Engineering (Electronic and Computer Systems Engineering) (Honours) at RMIT, Australia
- B.E. Computer Science at BITS Pilani and Bachelor of Engineering (Software Engineering) (Honours) program at RMIT, Australia

The partnership have included multiple programmes spanning several academic disciplines that are both desirable to students and are expected to produce graduates that are in demand by industry.

The academic model is innovative, and valuable offering to students. The Augmented Collaborative Articulation Pathway (ACAP) model presents a deeper engagement with the partner institution and students compared to a traditional articulation programme, including:

- Co-branded programmes with RMIT, including joint marketing, delivery and operational responsibilities.

- Students are recruited through the existing BITSAT admissions process.
- Students will spend two years at BITS campuses, before transferring to RMIT campuses in Australia.
- Students will have regular exposure to academics from both institutions in both locations.
- Students will receive dual degrees; one from each institution.
- Students complete their degree and obtain Post Study Work Rights in Australia.
- Student will pay a substantially lower overall cost compared to the entirely Australian programmes.

Input Qualification:

Candidates should have passed the 12th examination of 10+2 system from a recognized National/International board or its equivalent with Physics, Chemistry, and Mathematics as subjects and adequate proficiency in English.

In addition to meeting BITS academic and English requirements, the applicants need to meet the RMIT English language requirement of a minimum IELTS (Academic module) overall score of 6.5, with no band below 6.0 or equivalent. For equivalents to English entry requirements, see the English requirements web page.

Mode of Admission:

Admissions will be made purely on merit. The merit position of the candidate will be based on the score obtained by the candidate in a Computer based Online Test (BITSAT) conducted by BITS, Pilani. The candidates should also fulfil the essential requirement of a minimum of aggregate **75% marks** in Physics, Chemistry and Mathematics subjects in the 12th examination with at least 60% marks in each of the Physics, Chemistry, and Mathematics subjects.

Upon completion of the BITSAT successfully, students will make their Programme selections which will include the RMIT programmes. Details of applicants who meet BITS admission criteria will be forwarded to RMIT for assessment against RMIT eligibility criteria such as proof of year 12 marks and proof of English language proficiency to the RMIT standard.

Admission into the Academy for UAE (Dubai) based offerings will include details of applicants who meet BITS admission criteria being forwarded to RMIT for assessment against RMIT eligibility criteria such as proof of year 12 marks and proof of English language proficiency to the RMIT standard.

The RMIT admissions system, Studylink, will be used to support the entire admissions process including the generation of offer and the Genuine Temporary Entrant process.

Students that RMIT deems to have met RMIT's criteria will be confirmed with BITS. Successful applicants will be provided two offers from RMIT University (one for each of the offshore and onshore components), packaged with the BITS offer.

According to the UGC Regulations mentioned above, dual-degree programmes will be those which are offered by both the Indian and foreign university in the same subject area and at the same qualification level. Degrees will be awarded separately and simultaneously from both universities. Prospective students must meet the admission requirements of both the Indian and Foreign universities and shall apply to and be admitted separately to both universities.

Duration:

The normal duration of the programme will be 8 semesters (Four Semesters and a summer term at any of the Campuses of BITS Pilani and another four Semesters at RMIT Melbourne, Australia).

Why RMIT Melbourne, Australia?

- RMIT is a globally recognised university of science, technology, design and enterprise.
- RMIT is ranked 190th in the world by QS World University Rankings, 2022.
- BITS can derive reputational and ranking benefit from partnering with a globally-recognised Australian university.
- This collaboration will provide access to new groups of students seeking an international education.
- The partnership will create professional development opportunities for teaching, research and professional staff.
- Potential to uplift quality of curriculum and the possibility of introducing new programmes
- Collaborative research opportunities.

About BITS RMIT Academy

The vision is for high-quality partnered Academy with unique attributes: Enduring, large-scale partnership that create high-quality education and research opportunities for students and academics, and ultimately support India's sustainable development.

Objectives

The collaboration objectives of the partnerships are to develop an enduring, mutually beneficial and productive strategic partnership between the parties and to provide excellent student experiences and learning outcomes.

Motivation of any student to join such a programme

The project team landed on the partnered dual award (a*s it is defined in the UGC notification (F.No.4-1/2022 (IC)) Academic Collaboration between Indian and Foreign Higher Educational Institutions to offer Twinning, Joint Degree and Dual Degree Programmes*) with a student journey that spans India (or Dubai, UAE) and Australia.

The collaborative 'dual degree' academic model at international level provides for students to be 'separately and simultaneously' enrolled into each institution's programme. Students in the Academy will commence their degree studies with RMIT and BITS at the same time.

In the first 2 years of their study the Academy students will usually complete one RMIT course per semester in India or Dubai as well as completing the required courses in the BITS curriculum. The RMIT delivered courses have been carefully selected with student's overall study load in mind and in most instances these courses will be offered in lieu of a prescribed BITS courses.

After successfully completing the first 2 years of study in India or UAE, students will complete 2 additional years in Melbourne, Australia in the respective RMIT programme and receive the RMIT and BITS degrees as two separate awards on successful completion of the relevant courses.

The benefits to students are an overall lower cost international qualification, two degrees from well-established and internationally recognised universities, provide them with experience of RMIT learning and teaching style, various systems and processes and access to services and support that will prepare them for successful transition to their study in Australia.

In addition, an eligibility for post study work rights in Australia, a visa for international students who have recently graduated with a degree from an Australian institution, is a strong intensive for students. https://immi.homeaffairs.gov.au/visas/getting-a-visa/visa-listing/temporary-graduate-485/post-study-work. Please note that it is essential to get Visa from Australian embassy for admitted students before commencing their programme at RMIT Australia.

BITS Pilani and RMIT Melbourne, Australia have separately surveyed over 700 students in regard to the appeal of the proposal and received an overwhelmingly positive response.

Work Integrated Learning (WIL) and Professional exposure

BITS RMIT Academy shall provide enough opportunities to the students with an education that strongly links formal learning with professional or vocational practice.

Academy will adopt an approach that uses relevant work-based experiences to allow students to integrate theory with the meaningful practice of work as an intentional and assessed component of the curriculum. Students admitted through Academy will:

- Undertake and be assessed on structured activities that allow them to learn, apply and demonstrate their professional or vocational practice.
- Interact with industry and community when undertaking these activities
- Complete these activities in real work contexts or situations.
- Any or all of these aspects of a WIL experience may be in a simulated workplace environment.
- The 24 credit equivalent WIL courses in all the four engineering programs are: OENG1167 Engineering Capstone Project Part A and OENG1168 Engineering Capstone Project Part B where students will work under the guidance of a professional engineer who may be from industry or be an academic or research staff member. Students will apply their technical knowledge, research, design and professional engineering skills to either discipline specific, or cross disciplinary engineering problems, through robust research and established engineering design processes.
- In addition, students are encouraged to undertake at least 10 weeks of engineering work experience supervised by a professional engineer. This can be done by enrolling in the optional course OENG1165 Professional Engineering Experience. The course is normally undertaken in the summer vacation period between years 3 and 4 of the program, but it can be taken at other times to align with their placements. Students usually source their placement opportunities, a task that aids development of critical career skills in identifying suitable roles and performing well in the recruitment process.

Employment Scenario/ opportunities, etc.

RMIT was ranked 74th in the QS Graduate Employability Rankings 2022. The **four** dual degree programmes in collaboration with RMIT programmes are proposed to be launched in AY 2023-24 as part of partnership arrangement, which have strong connections with the industry. The formation and engagement with the Industry Advisory Committees with membership from external industry and professional institutions help RMIT inform their programme development and ensure that the RMIT-delivered programme content and student learning outcomes remain closely aligned with the needs of

future employers. These programmes provide students with an opportunity to work on research projects and practical activities/capstone projects as part of their curriculum.

The engineering programmes proposed for this partnership are fully accredited by Engineers Australia (www.engineersaustralia.org.au/publications/engineers-australia-accredited-programmes) - the professional body responsible for the accreditation of higher education programmes that prepare students to practise as professional engineers. Engineers Australia is a signatory to the Washington Accord. This means that the degree is internationally recognised, and graduates are able to practise as professional engineers in many countries around the world.

Post-study work visas of up to 4 years granted to eligible students provide greater opportunities for academy graduates to participate in Australia's future skilled workforce.

RMIT provides students with access to personalised services, resources and opportunities to help plan their careers, find work and get the job-ready skills employers seek.

https://www.rmit.edu.au/students/careers-opportunities/jobs-careers-employability

The semester-wise pattern of the following programmes, for students admitted to this programme in first semester are given below:

- B.E. Civil at BITS Pilani and Bachelor of Engineering (Civil and Infrastructure) (Honours) at RMIT, Australia
- B.E. Mechanical at BITS Pilani and Bachelor of Engineering (Mechanical) (Honours) at RMIT, Australia
- B.E. Electrical & Electronics at BITS Pilani and Bachelor of Engineering (Electrical Engineering) (Honours) at RMIT, Australia
- B.E. Electronics & Communication at BITS Pilani and Bachelor of Engineering (Electronic and Computer Systems Engineering) (Honours) at RMIT, Australia
- B.E. Computer Science at BITS Pilani and Bachelor of Engineering (Software Engineering) (Honours) program at RMIT, Australia

The general curricular structure for the students admitted under Augmented Collaborative Articulation Pathway (ACAP) through BITS RMIT Academy is given below:

Category	Courses to be offered at BITS Pilani		Courses to be offered at RMIT (for BITS Requirement)		Total	
	Courses	Unit	Courses	Eq. Unit*	Courses	Unit
Humanities Elective	2-3	6-9	0-1	0-4	3	9
Science Foundation	6	12			6	12
Mathematics Foundation	4	12			4	12
Engineering Foundation	2	6			2	6
Technical Arts	4	12			4	12
General Awareness / Professional Courses	2	7			2	7
Sub-Total	**20-21**	**55-58**	**0-1**	**0-4**	**21**	**58**
Core	8-10	26-33	4-8	14-23	14-16	47-50
Discipline Elective			4	12-14	4	12-14
Sub-Total	**8-10**	**26-33**	**8-12**	**28-37**	**18-20**	**60-63**
Open Elective	1-3	4-10	2-4	6-14	5	16-18
Capstone Project			2	8	2	8
Grand Total	**30-32**	**89-94**	**15-17**	**51-56**	**46-48**	**144 (Min)**

***Equivalent Unit:** Assuming a course of 3-4 units offered at BITS Pilani is equivalent to a 12-credit points course offered by RMIT. The Unit of each Capstone Project offered at RMIT is proposed to be considered equal to 4 units at BITS Pilani. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani.

Note:

1. Unlike other BITS students, BITS-RMIT Academy students need not to register for Practice School or Thesis. Such students will have to complete two Capstone Projects in place of Practice School II or First Degree Thesis to meet the requirements of their degree programmes.

2. As the courses which are offered at RMIT have different credit points (12 units per course), the grades earned by the students at RMIT will be converted appropriately by making equivalency of the courses and by converting RMIT credit points into BITS units, and the CGPA shall be calculated accordingly based on their grades earned in all the respective courses.

3. Table given above describes the general curricular structure for the first degree programmes offered under BITS RMIT Academy. Accordingly, the semesterwise pattern of each specific programme is designed as given below to fulfil degree requirement of BITS Pilani for BITS-RMIT academy students.

Semester-wise Pattern for Students Admitted to B.E. Civil under BITS – RMIT Academy								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	EEE	F111	Electrical Sciences	3
	CHEM	F111	General Chemistry	3	BITS	F112	Technical Report Writing	2
	MATH	F111	Mathematics I	3	MATH	F113	Probability and Statistics	3
	PHY	F110	Physics Laboratory	1	BITS	F111	Thermodynamics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F235	Digital Fundamentals②	4
	BITS	F234	Introduction to Engineering Design①	4				
				19				**20**
Summer Term								
			Humanities Elective					3
			Humanities Elective					3
II	MATH	F211	Mathematics III	3	ECON Or MGTS	F211 Or F211	Principles of Economics Or Principles of Management	3
	CE	F211	Mechanics of Solids	3	CE	F241	Analysis of Structures	3
	CE	F213	Surveying	4	CE	F242	Construction Planning & Technology	3
	CE	F230	Civil Engineering Materials	4	CE	F243	Soil Mechanics	4
	CE	F231	Fluid Mechanics	3	CE	F244	Highway Engineering	4
	BITS	F236	Foundations of Artificial Intelligence for STEM③	4	BITS	F237	STEM for Sustainable Development ④	4
							Humanities Elective	3
				21 (min)				**24 (min)**
III	CIVE	1179	Steel Structures 1 ⑤	12	CIVE	1149	Engineering Practice 5 – Construction Management ⑨	12
	CIVE	1108	Geotechnical Engineering 2 ⑥	12	CIVE	1143	Analysis of Complex Structures ⑩	12
	CIVE	1177	Concrete Structures 1 ⑦	12	CIVE	1155	Engineering Practice 6 - Sustainable Infrastructure Design ⑪	12
	CIVE	1153	Storm water Management ⑧	12	CIVE	1217	Engineering Economics and Infrastructure Planning ⑫	12
				48				**48**
IV	CIVE	1145	Catchment Water Management ⑬	12	BIOL	2525	Cyber-Physical-Biological Systems: Technology for a Digital world ⑯	12
	CIVE	1200	Wastewater Systems Design and Modelling ⑭	12	OENG	1168	Engineering Capstone Project Part B ⑱	12
	CIVE	1210	Steel Structures 2 ⑮	12	OENG	1235	Innovation Ecosystem and the Future of Work ⑲	12
	OENG	1167	Engineering Capstone Project Part A ⑰	12	CIVE	1173	Infrastructure Management ⑳	12
				48				**48**

Note: Units/Credit points earned for the course(s) in BITS Pilani and RMIT shall be considered towards degrees to be awarded by both institutions in accordance with the following:

1. To complete the BITS Pilani Degree, students need to complete a minimum total of 144 units with a minimum number of 46 courses (four courses with 16 units offered jointly by BITS and RMIT + twenty-six courses with 74 units (min.) offered by BITS in first two years, including summer term + sixteen courses with 54 equivalent units offered by RMIT). The Equivalent Unit is considered by assuming that a course of 3-4 units offered at BITS Pilani is equivalent to a 12-credit points course offered by RMIT.
2. To complete the RMIT Degree, students need to complete 384 credit points in total (four courses with 48 credit points offered jointly by BITS and RMIT + twelve mapped courses with 144 equivalent credit points offered by BITS in the first two years + sixteen courses with 192 credit points offered by RMIT).
3. Upon completion of all BITS Pilani Courses during Years 1 and 2 (including summer term, if any) at the BITS Campus, students will receive 144 credit points as an RMIT credit exemption against the twelve mapped courses to complete the RMIT Degree in accordance with RMIT's policies and procedures.
4. Upon completion of all RMIT Courses, students will receive 70 units of transfer credit for the twenty mapped courses to complete the BITS Pilani Degree in accordance with BITS' policies and procedures.
5. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani and RMIT.
6. The details of an encircled number given against the selected courses in the semester-wise pattern are given below:

Symbol	Description
①	Course BITS F234: Introduction to Engineering Design would be offered to BITS-RMIT Academy students in place of BITS F110: Engineering Graphics. This will also be equivalent to OENG1277: Introduction to Engineering Design offered at RMIT.
②	Course BITS F235: Digital Fundamentals would be offered to BITS-RMIT Academy students in place of CS F111: Computer Programming. This will also be equivalent to OENG1278: Digital Fundamentals offered at RMIT.
③	Course BITS F236: Foundations of Artificial Intelligence for STEM is one of the required courses from STEM future Technology Skill Courses' pool at RMIT and will also be the 1st Open Elective out of 5 required at BITS Pilani.
④	Course BITS F237: STEM for Sustainable Development would be offered to BITS-RMIT Academy students in place of BITS F225: Environmental Studies. This will also be equivalent to ONPS2747: STEM for Sustainable Development offered by RMIT, which is one of the required courses from STEM future Technology Skill Courses' pool at RMIT.
⑤	Course CIVE 1179: Steel Structures 1 is the core course offered in 3rd year at RMIT. Also, this will be equivalent to CE F343: Design of Steel Structures offered at BITS Pilani. Both are the core courses at the respective Institutes.
⑥	Course CIVE 1108: Geotechnical Engineering 2 will be treated as equivalent to CE F313: Foundation Engineering. Both are the core courses at the respective Institutes.
⑦	Course CIVE 1177: Concrete Structures 1 will be treated as equivalent to CE F320: Design of Reinforced Concrete Structures. Both are core courses at the respective Institutes.
⑧	BITS-RMIT Academy Students shall be advised to take the course CIVE 1153: Stormwater Management mandatorily. This will be the 1st course out 4 from list of Minor Studies "Sustainable Water Management" required at RMIT and will be treated as the core course offered at BITS, namely CE F312: Hydraulics Engineering.

⑨	Course CIVE 1149: Engineering Practice 5 is the core course offered at RMIT. Also, this will be the 1st Discipline course out of 4 required at BITS either as a project type course or a new elective to be introduced.
⑩	Course CIVE 1143: Analysis of Complex Structures is the core course offered at RMIT. Also, this will be the 2nd Discipline course out of 4 required at BITS either as a project type course or a new elective to be introduced.
⑪	Course CIVE 1155: Engineering Practice 6 - Sustainable Infrastructure Design is the core course offered at RMIT. Also, this will be the 3rd Discipline course out of 4 required at BITS either as a project type course or a new elective to be introduced.
⑫	Course CIVE 1217: Engineering Economics and Infrastructure Planning is the core course offered at RMIT. Also, this will be the 2nd Open Elective out of 5 required at BITS either as a project type course or a new elective shall be introduced at BITS.
⑬	Academy Students shall be advised to take the course CIVE 1145: Catchment Water Management mandatorily. This will be the 2nd course out of 4 from list of Minor Studies "Sustainable Water Management" required at RMIT and will be treated as the a core course offered at BITS, namely CE F321: Engineering Hydrology.
⑭	BITS-RMIT Academy Students shall be advised to take the course CIVE 1200: Wastewater Systems Design and Modelling mandatorily. This will be the 3rd course out of 4 from list of Minor Studies "Sustainable Water Management" required at RMIT and will be treated as the a core course offered at BITS, namely CE F342: Water & Wastewater Treatment.
⑮	Course CIVE 1210: Steel Structures 2 is the core course offered at RMIT. Also, this will be the 4th Discipline course out of 4 required at BITS.
⑯	Course BIOL2525: Cyber-Physical-Biological Systems: Technology for a Digital world is one of the required courses from STEM future Technology Skill Courses' pool at RMIT and will also considered as the 3rd Open Elective out of 5 required at BITS).
⑰	Course OENG 1167: Engineering Capstone Project Part A is one of the required courses at RMIT. Also, this will be equivalent to BITS F456: Capstone Project I to be offered at BITS Pilani. All BITS-RMIT Academy students have to do two Capstone Projects in place of Practice School II/Thesis.
⑱	Course OENG 1168: Engineering Capstone Project Part B is one of the required courses at RMIT. Also, this will be equivalent to BITS F457: Capstone Project II to be offered at BITS Pilani. All BITS-RMIT Academy students have to do two Capstone Projects in place of Practice School II/Thesis.
⑲	Course OENG 1235: Innovation Ecosystem and the Future of Work is one of the required courses from STEM future Technology Skill Courses' pool at RMIT and will be also considered as 4th Open Elective out of 5 required ones at BITS).
⑳	A course from the option list or one University Elective available at RMIT not completed earlier such as CIVE 1173 Infrastructure Management or any other course available in the pool (Also, this will be an 5th Open Elective out of 5 required at BITS).

Semester-wise Pattern for Students Admitted to B.E. Mechanical under BITS – RMIT Academy								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	EEE	F111	Electrical Sciences	3
	CHEM	F111	General Chemistry	3	BITS	F112	Technical Report Writing	2
	MATH	F111	Mathematics I	3	MATH	F113	Probability and Statistics	3
	PHY	F110	Physics Laboratory	1	BITS	F111	Thermodynamics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F235	Digital Fundamentals②	4
	BITS	F234	Introduction to Engineering Design①	4				
				19				**20**
Summer Term								
			Humanities Elective					3
			Humanities Elective					3
			Humanities Elective					3
II	MATH	F211	Mathematics III	3	ECON Or MGTS	F211 Or F211	Principles of Economics Or Principles of Management	3
	ME	F211	Mechanics of Solids	3	ME	F218	Advanced Mechanics of Solids	3
	ME	F213	Materials Science and Engineering	3	ME	F219	Manufacturing Processes	4
	ME	F217	Applied Thermodynamics	4	ME	F220	Heat Transfer	4
	ME	F212	Fluid Mechanics	3	ME	F316	Manufacturing Management	2
	BITS	F236	Foundations of Artificial Intelligence for STEM③	4	BITS	F237	STEM for Sustainable Development ④	4
			Open Elective	3			Open Elective	3
				23 (min)				**23 (min)**
III	MIET	1077	Mechanics and Machines ⑤	12	MIET	1076	Mechanical Vibration ⑥	12
	MIET	2136	Mechanical Design 1 ⑨	12	MANU	1170	Advanced Manufacturing Processes ⑲	12
	MIET	1084	Finite Element Analysis ⑦	12	MIET	2518	Thermal Fluid System Design ⑪	12
	OENG	1235	Innovation Ecosystem and the Future of Work ⑳	12	BIOL	2525	Cyber-Physical-Biological Systems: Technology for a Digital world ⑫	12
				48				**48**
IV	OENG	1167	Engineering Capstone Project Part A ⑬	12	OENG	1168	Engineering Capstone Project Part B ⑭	12
	AUTO	1006	Vehicle Power System ⑮	12	MIET	2032	Renewable Energy Systems ⑯	12
	MIET	1068	Mechanical Design 2 ⑱	12	MIET Or MIET	2530 2002	Advanced Computer Aided Design ⑧ Or Advanced Engineering Computer Aided Design ⑧	12
	MIET	2006	Automatic Control ⑩	12	MIET Or MIET	2522 Or 2394	Energy Efficiency and Demand Management⑰ Or Computational Fluid Dynamics ⑰	12

Semester-wise Pattern for Students Admitted to B.E. Mechanical under BITS – RMIT Academy								
Year	First Semester			U	Second Semester			U
				48				48

Note: Units/Credit points earned for the course(s) in BITS Pilani and RMIT shall be considered towards degrees to be awarded by both institutions in accordance with the following:

1. To complete the BITS Pilani Degree, students need to complete a minimum total of 145 units with a minimum number of 46 courses (four courses with 16 units offered jointly by BITS and RMIT + twenty-eight courses with 78 units (min.) offered by BITS in first two years, including summer term + sixteen courses with 51 equivalent units offered by RMIT). The Equivalent Unit is considered by assuming that a course of 3-4 units offered at BITS Pilani is equivalent to a 12-credit points course offered by RMIT.
2. To complete the RMIT Degree, students need to complete 384 credit points in total (four courses with 48 credit points offered jointly by BITS and RMIT + twelve mapped courses with 144 equivalent credit points offered by BITS in the first two years + sixteen courses with 192 credit points offered by RMIT).
3. Upon completion of all BITS Pilani Courses during Years 1 and 2 (including summer term, if any) at the BITS Campus, students will receive 144 credit points as an RMIT credit exemption against the twelve mapped courses to complete the RMIT Degree in accordance with RMIT's policies and procedures.
4. Upon completion of all RMIT Courses, students will receive 68 units of transfer credit for the twenty mapped courses to complete the BITS Pilani Degree in accordance with BITS' policies and procedures.
5. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani and RMIT.
6. The details of an encircled number given against the selected courses in the semester-wise pattern are given below:

Symbol	Description
①	Course BITS F234: Introduction to Engineering Design would be offered to BITS-RMIT Academy students in place of BITS F110: Engineering Graphics. This will also be equivalent to OENG1277: Introduction to Engineering Design offered at RMIT.
②	Course BITS F235: Digital Fundamentals would be offered to BITS-RMIT Academy students in place of CS F111: Computer Programming. This will also be equivalent to OENG1278: Digital Fundamentals offered at RMIT.
③	Course BITS F236: Foundations of Artificial Intelligence for STEM is one of the required courses from STEM future Technology Skill Courses' pool at RMIT and will also be the 1st Open Elective out of 5 required at BITS Pilani.
④	Course BITS F237: STEM for Sustainable Development would be offered to BITS-RMIT Academy students in place of BITS F225: Environmental Studies. This will also be equivalent to ONPS2747: STEM for Sustainable Development offered by RMIT, which is one of the required courses from STEM future Technology Skill Courses' pool at RMIT.
⑤	Course MIET 1077 Mechanics and Machines is the core course offered at RMIT. Also, this will be equivalent to ME F221 Mechanisms and Machines offered at BITS Pilani. Both are the core courses at the respective Institutes.
⑥	Course MIET1076 Mechanical Vibration is the core course offered at RMIT. Also, this will be equivalent to ME F319 Vibrations and Control offered at BITS Pilani. Both are the core courses at the respective Institutes.
⑦	Course MIET1084 Finite Element Analysis is the core course offered at RMIT. Also, this will be the 1st Discipline course out of 4 required at BITS, may be considered as equivalent to ME G512 Finite Element Methods.
⑧	Course MIET2530 Advanced Computer Aided Design or MIET2002 Advanced

	Engineering Computer Aided Design is to be offered at RMIT. Also, this will be equivalent to ME F318 Computer-Aided Design offered at BITS Pilani as one of the core courses. This is the discipline elective or minor at RMIT.
⑨	Course MIET2136 Mechanical Design 1 is the core course offered at RMIT. Also, this will be equivalent to ME F314 Design of Machine Elements offered at BITS Pilani. Both are the core courses at the respective Institutes.
⑩	Course MIET2006 Automatic Control is the core course offered at RMIT. Also, this will be the 2nd Discipline course out of 4 required at BITS, may be considered as equivalent to EEE F242 Control Systems.
⑪	Course MIET2518 Thermal Fluid System Design is the core course offered at RMIT. Also, this will be equivalent to ME F341 Prime Movers & Fluid Machines offered at BITS Pilani. Both are the core courses at the respective Institutes.
⑫	Course BIOL2525: Cyber-Physical-Biological Systems: Technology for a Digital world is one of the required courses from STEM future Technology Skill Courses' pool at RMIT and will also considered as the 4th Open Elective out of 5 required at BITS).
⑬	Course OENG 1167: Engineering Capstone Project Part A is one of the required courses at RMIT. Also, this will be equivalent to BITS F456: Capstone Project I to be offered at BITS Pilani. All BITS-RMIT Academy students have to do two Capstone Projects in place of Practice School II/Thesis.
⑭	Course OENG 1168: Engineering Capstone Project Part B is one of the required courses at RMIT. Also, this will be equivalent to BITS F457: Capstone Project II to be offered at BITS Pilani. All BITS-RMIT Academy students have to do two Capstone Projects in place of Practice School II/Thesis.
⑮	Course AUTO1006 Vehicle Power System is one of the courses offered at RMIT. Also, this will be equivalent to ME F317 Engines, Motors, and Mobility offered at BITS Pilani. Both are the core courses at the respective Institutes
⑯	Course MIET2032 Renewable Energy Systems is one of the courses offered at RMIT. Also, this will be the 3rd Discipline course out of 4 required at BITS, may be considered as equivalent to BITS F462 Renewable Energy.
⑰	Course MIET2394 Computational Fluid Dynamics or MIET2522 Energy Efficiency and Demand Management is to be offered at RMIT. Also, this will be the 4th Discipline course out of 4 required at BITS, may be considered as equivalent to ME F485 Numerical Techniques for Fluid Flow and Heat Transfer or ME F424 Energy Management, respectively offered at BITS. This will be considered as a discipline elective or minor at RMIT.
⑱	Course MIET1068 Mechanical Design 2 is one of the core courses offered at RMIT. Also, this will be equivalent to ME F320 Engineering Optimization offered at BITS Pilani. Both are the core courses at the respective Institutes.
⑲	Course MANU1170 Advanced Manufacturing Processes is one of the core courses offered at RMIT. Also, this will be equivalent to ME F315 Advanced Manufacturing Processes offered at BITS Pilani. Both are the core courses at the respective Institutes
⑳	Course OENG 1235: Innovation Ecosystem and the Future of Work is one of the required courses from STEM future Technology Skill Courses' pool at RMIT and will also be considered as 5th Open Elective out of 5 required ones at BITS).

Semester-wise Pattern for Students Admitted to B.E. Electrical and Communication under BITS – RMIT Academy								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	EEE	F111	Electrical Sciences	3
	CHEM	F111	General Chemistry	3	BITS	F112	Technical Report Writing	2
	MATH	F111	Mathematics I	3	MATH	F113	Probability and Statistics	3
	PHY	F110	Physics Laboratory	1	BITS	F111	Thermodynamics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F235	Digital Fundamentals②	4
	BITS	F234	Introduction to Engineering Design①	4				
				19				**20**
Summer Term								
		Humanities Elective						3
		Humanities Elective						3
II	MATH	F211	Mathematics III	3	ECON	F211	Principles of Economics	3
	EEE	F211	Electrical Machines	4			Or	or
	EEE	F212	Electromagnetic Theory	3	MGTS	F211	Principles of Management	3
	EEE	F215	Digital Design	4	EEE	F241	Microprocessors & Interfacing	4
	EEE	F214	Electronic Devices	3	EEE	F242	Control Systems	3
	BITS	F236	Foundations of Artificial Intelligence for STEM③	4	EEE	F243	Signals & Systems	3
					EEE	F244	Microelectronic Circuits	3
					BITS	F237	STEM for Sustainable Development ④	4
							Humanities Elective	3
				21 (min)				**23 (min)**
III	EEET	2097	Electronic Circuits⑤	12	EEET	1415	Circuit and System Simulation⑨	12
	EEET	2114	Wireless and Guided Waves ⑥	12	EEET	2368	Network Fundamentals and Applications ⑩	12
	BIOL	2525	Cyber-Physical-Biological Systems: Technology for a Digital World ⑦	12	EEET	2098	Electronic Engineering 3 ⑪	12
	EEET	2254	Communication Engineering 1 ⑧	12	EEET	1416	Digital Signal Processing for Communication Engineering ⑫	12
					EEET	2384	Professional Engineering Experience ⑯	12
				48				**48**
IV	EEET	1070	Optical Fibre Systems and Networks ⑬	12	OENG	1168	Engineering Capstone Project Part B ⑰	12
	OENG	1235	Innovation Ecosystem and the Future of Work ⑭	12	EEET	2290	Network Engineering ⑱	12
			Elective⑮	12	EEET	2370	Wireless Sensor Networks and the Internet of Things ⑲	12
	OENG	1167	Engineering Capstone Project Part A⑯	12	EEET	1083	Advanced Mobile and Wireless Systems Engineering ⑳	12
				48				**48**

Note: Units/Credit points earned for the course(s) in BITS Pilani and RMIT shall be considered towards degrees to be awarded by both institutions in accordance with the following:

1. To complete the BITS Pilani Degree, students need to complete a minimum total of 145 units with a minimum number of 46 courses (four courses with 16 units offered jointly by BITS and RMIT + twenty-six courses with 73 units (min.) offered by BITS in first two years, including summer term + sixteen courses with 56 equivalent units offered by RMIT). The Equivalent Unit is considered by assuming that a course of 3-4 units offered at BITS Pilani is equivalent to a 12-credit points course offered by RMIT.
2. To complete the RMIT Degree, students need to complete 384 credit points in total (four courses with 48 credit points offered jointly by BITS and RMIT + twelve mapped courses with 144 equivalent credit points offered by BITS in the first two years + sixteen courses with 192 credit points offered by RMIT).
3. Upon completion of all BITS Pilani Courses during Years 1 and 2 (including summer term, if any) at the BITS Campus, students will receive 144 credit points as an RMIT credit exemption against the twelve mapped courses to complete the RMIT Degree in accordance with RMIT's policies and procedures.
4. Upon completion of all RMIT Courses, students will receive 71 units of transfer credit for the twenty mapped courses to complete the BITS Pilani Degree in accordance with BITS' policies and procedures.
5. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani and RMIT.
6. The details of an encircled number given against the selected courses in the semester-wise pattern are given below:

Symbol	Description
①	Course BITS F234: Introduction to Engineering Design would be offered to BITS-RMIT Academy students in place of BITS F110: Engineering Graphics. This will also be equivalent to OENG1277: Introduction to Engineering Design offered at RMIT.
②	Course BITS F235: Digital Fundamentals would be offered to BITS-RMIT Academy students in place of CS F111: Computer Programming. This will also be equivalent to OENG1278: Digital Fundamentals offered at RMIT.
③	Course BITS F236: Foundations of Artificial Intelligence for STEM is one of the required courses from STEM future Technology Skill Courses' pool at RMIT and will also be the 1st Open Elective out of 5 required at BITS Pilani.
④	Course BITS F237: STEM for Sustainable Development would be offered to BITS-RMIT Academy students in place of BITS F225: Environmental Studies. This will also be equivalent to ONPS2747: STEM for Sustainable Development offered by RMIT, which is one of the required courses from STEM future Technology Skill Courses' pool at RMIT.
⑤	Course EEET 2097: Electronic Circuits is the core course offered at RMIT. Also, this will be equivalent to the core course EEE F341: Analog Electronics offered at BITS Pilani. Both are the core courses at the respective Institutes.
⑥	Course EEET 2114: Wireless and Guided Waves is the core course offered at RMIT. Also, this will be equivalent to the core course ECE F314: Electromagnetic Fields & Microwave Engineering offered at BITS Pilani. Both are the core courses at the respective Institutes
⑦	Course BIOL 2525: Cyber-Physical-Biological Systems: Technology for a Digital World is to be offered as one of the University Elective Course at RMIT. This is interchangeable with OENG 1235 Innovation Ecosystem and the Future of Work ⑮. Also, this will be the 2nd Open Elective out of 5 required at BITS.
⑧	Course EEET 2254: Communication Engineering 1 is the core course offered at RMIT. Also, this will be equivalent to the core course ECE F311: Communication Systems offered at BITS Pilani. Both are the core courses at the respective Institutes.
⑨	Course EEET 1415: Circuit and System Simulation is the core course offered at RMIT.

Symbol	Description
	Also, this will be the 1st Discipline Elective out of 5 required at BITS.
⑩	Course EEET2368: Network Fundamentals and Applications is the 3rd University Elective Course offered at RMIT. Also, this will be the 2nd Discipline course out of 4 required at BITS as EEE F346: Data Communication Networks.
⑪	Course EEET 2098: Electronic Engineering 3 is the core course at RMIT. Also, this will be the 3rd Open Elective out of 5 required at BITS as EEE F422: Modern Control Systems.
⑫	Course EEET 1416: Digital Signal Processing for Communication Engineering is 1st of the 6 Technical Option Courses offered at RMIT. Also, this will be equivalent to core course ECE F434: Digital Signal Processing offered at BITS Pilani.
⑬	Course EEET 1070: Optical Fibre Systems and Networks is the core course offered at RMIT. Also, this will be the 3rd Discipline course out of 4 required at BITS as EEE F426: Fiber Optics & Optoelectronics.
⑭	Course OENG 1235: Innovation Ecosystem and the Future of Work. This is interchangeable with BIOL 2525: Cyber-Physical-Biological Systems: Technology for a Digital World ⑦. Also, this will be the 4th Open elective course out of 5 required at BITS.
⑮	Course EEET 2384: Professional Engineering Experience will be taken in case the student gets placed and will be taken after year 3(second semester) and before year 4 (first semester). Else, they will take any open elective from RMIT in 42. Also, this will be the 5th Open Elective out of 5 required at BITS.
⑯	Course OENG 1167: Engineering Capstone Project Part A is one of the required courses at RMIT. Also, this will be equivalent to BITS F456: Capstone Project I to be offered at BITS Pilani. All BITS-RMIT Academy students have to do two Capstone Projects in place of Practice School II/Thesis.
⑰	Course OENG 1168: Engineering Capstone Project Part B is one of the required courses at RMIT. Also, this will be equivalent to BITS F457: Capstone Project II to be offered at BITS Pilani. All BITS-RMIT Academy students have to do two Capstone Projects in place of Practice School II/Thesis.
⑱	Course EEET 2290: Network Engineering is 1st of the 6 Technical Option Courses offered at RMIT. Also, this will be equivalent to the core course ECE F343: Communication Networks offered at BITS Pilani.
⑲	Course EEET 2370: Wireless Sensor Networks and the Internet of Things is 3rd of the 6 Technical Option Courses offered at RMIT. Also, this will be the 4th Discipline course out of 4 required at BITS as EEE F411: Internet of Things.
⑳	Course EEET 1083: Advanced Mobile and Wireless Systems Engineering is 4^{th} of the 6 Technical Option Courses offered at RMIT. Also, this will be equivalent to core course ECE F344: Information Theory & Coding offered at BITS Pilani.

Semester-wise Pattern for Students Admitted to B.E. Electrical and Electronics under BITS – RMIT Academy								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	EEE	F111	Electrical Sciences	3
	CHEM	F111	General Chemistry	3	BITS	F112	Technical Report Writing	2
	MATH	F111	Mathematics I	3	MATH	F113	Probability and Statistics	3
	PHY	F110	Physics Laboratory	1	BITS	F111	Thermodynamics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	BITS	F235	Digital Fundamentals②	4
	BITS	F234	Introduction to Engineering Design①	4				
				19				**20**
II	MATH	F211	Mathematics III	3	ECON MGTS	F211 F211	Principles of Economics Or Principles of Management	3 3
	EEE	F211	Electrical Machines	4	EEE	F241	Microprocessors & Interfacing	4
	EEE	F212	Electromagnetic Theory	3	EEE	F242	Control Systems	3
	EEE	F215	Digital Design	4	EEE	F243	Signals & Systems	3
	EEE	F214	Electronic Devices	3	EEE	F244	Microelectronic Circuits	3
	BITS	F2236	Foundations of Artificial Intelligence for STEM③	4	BITS	F237	STEM for Sustainable Development ④	4
			Humanities Elective	3			Humanities Elective	3
				24 (min)				**23 (min)**
Summer Term								
	EEE	F313	Analog & Digital VLSI Design	3				
	EEE	F341	Analog Electronics	4				
III	EEET	2106	Power System Analysis and Control ⑤	12	BIOL	2525	Cyber-Physical-Biological Systems: Technology for a Digital World ⑨	12
	EEET	2263	Electrical Plant ⑥	12	OENG	1235	Innovation Ecosystem and the Future of Work ⑩	12
	EEET	2274	Electrical Energy Conversion ⑦	12	EEET	2273	Protection and High Voltage Engineering ⑪	12
	EEET	2105	Industrial Automation ⑧	12	EEET	2384	Introduction to Electrical Building Design ⑫	12
				48				**48**
IV	EEET	2380	Advanced Power Systems ⑬	12	OENG	1168	Engineering Capstone Project Part B ⑰	12
	EEET	2334	Renewable Electrical Energy Systems ⑭	12	EEET	2171	Intelligent Systems ⑱	12
	EEET	2613	Smart Grids ⑮	12	EEET	2254	Communication Engineering 1 ⑲	12
	OENG	1167	Engineering Capstone Project Part A ⑯	12	EEET	2100	Advanced Control Systems ⑳	12
				48				**48**

Note: Units/Credit points earned for the course(s) in BITS Pilani and RMIT shall be considered towards degrees to be awarded by both institutions in accordance with the following:

1. To complete the BITS Pilani Degree, students need to complete a minimum total of 144 units with a minimum number of 46 courses (four courses with 16 units offered jointly by BITS and RMIT + twenty-seven courses with 77 units (min.) offered by BITS in first two years, including summer term + sixteen courses with 51 equivalent units offered by RMIT). The Equivalent Unit is considered by assuming that a course of 3-4 units offered at BITS Pilani is equivalent to a 12-credit points course offered by RMIT.
2. To complete the RMIT Degree, students need to complete 384 credit points in total (four courses with 48 credit points offered jointly by BITS and RMIT + twelve mapped courses with 144 equivalent credit points offered by BITS in the first two years + sixteen courses with 192 credit points offered by RMIT).
3. Upon completion of all BITS Pilani Courses during Years 1 and 2 (including summer term, if any) at the BITS Campus, students will receive 144 credit points as an RMIT credit exemption against the twelve mapped courses to complete the RMIT Degree in accordance with RMIT's policies and procedures.
4. Upon completion of all RMIT Courses, students will receive 71 units of transfer credit for the twenty mapped courses to complete the BITS Pilani Degree in accordance with BITS' policies and procedures.
5. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani and RMIT.
6. The details of an encircled number given against the selected courses in the semester-wise pattern are given below:

Symbol	Description
①	Course BITS F234: Introduction to Engineering Design would be offered to BITS-RMIT Academy students in place of BITS F110: Engineering Graphics. This will also be equivalent to OENG1277: Introduction to Engineering Design offered at RMIT.
②	Course BITS F235: Digital Fundamentals would be offered to BITS-RMIT Academy students in place of CS F111: Computer Programming. This will also be equivalent to OENG1278: Digital Fundamentals offered at RMIT.
③	Course BITS F236: Foundations of Artificial Intelligence for STEM is one of the required courses from STEM future Technology Skill Courses' pool at RMIT and will also be the 1st Open Elective out of 5 required at BITS Pilani.
④	Course BITS F237: STEM for Sustainable Development would be offered to BITS-RMIT Academy students in place of BITS F225: Environmental Studies. This will also be equivalent to ONPS2747: STEM for Sustainable Development offered by RMIT, which is one of the required courses from STEM future Technology Skill Courses' pool at RMIT.
⑤	Course EEET 2106: Power System Analysis and Control is the core course offered at RMIT. Also, this will be equivalent to EEE F312: Power Systems offered at BITS Pilani. Both are the core courses at the respective Institutes
⑥	Course EEET 2263: Electrical Plant is the core course offered at RMIT. Also, this will be the 1st Discipline course out of 4 required at BITS as EEE F475: Special Electrical Machines.
⑦	Course EEET 2274: Electrical Energy Conversion is the core course offered at RMIT. Also, this will be equivalent to EEE F342: Power Electronics offered at BITS Pilani. Both are the core courses at the respective Institutes
⑧	Course EEET 2105: Industrial Automation is the core course offered in 3rd year at RMIT. Also, this will be the 2nd Open Elective out of 5 required at BITS.

Symbol	Description
⑨	Course BIOL 2525: Cyber-Physical-Biological Systems: Technology for a Digital World is the 1st University Elective Course offered at RMIT. Also, this will be the 3rd Open Elective out of 5 required at BITS.
⑩	Course OENG 1235: Innovation Ecosystem and the Future of Work. This will be also considered as 3rd humanities elective at BITS Pilani out of 3 required. This will also be one of the required courses from STEM future Technology Skill Courses' pool at RMIT.
⑪	Course EEET 2273: Protection and High Voltage Engineering is the 3rd University Elective Course offered at RMIT. Also, this will be the 2nd Discipline course out of 4 required at BITS as EEE F476: Switchgear and Protection.
⑫	Course EEET 2384: Introduction to Electrical Building Design is the 4th University Elective Course offered at RMIT. Also, this will be the 3rd Discipline course out of 4 required at BITS as EEE F427: Electric Power Utilization and Illumination.
⑬	Course EEET 2380: Advanced Power Systems is the core course offered at RMIT. Also, this will be the 4th Discipline course out of 4 required at BITS as EEE F462: Advanced Power Systems.
⑭	Course EEET 2334: Renewable Electrical Energy Systems is the core course offered at RMIT. Also, this will be the 4th Open Elective out of 5 required at BITS as EEE F473: Wind Electrical Systems
⑮	Course EEET 2613: Smart Grids is 2nd of the 6 Technical Option Courses offered at RMIT. Also, this will be the 5th Open Elective out of 5 required at BITS as EEE F424: Smart Grid for Sustainable Energy.
⑯	Course OENG 1167: Engineering Capstone Project Part A is one of the required courses at RMIT. Also, this will be equivalent to BITS F456: Capstone Project I to be offered at BITS Pilani. All BITS-RMIT Academy students have to do two Capstone Projects in place of Practice School II/Thesis.
⑰	Course OENG 1168: Engineering Capstone Project Part B is one of the required courses at RMIT. Also, this will be equivalent to BITS F457: Capstone Project II to be offered at BITS Pilani. All BITS-RMIT Academy students have to do two Capstone Projects in place of Practice School II/Thesis.
⑱	Course EEET 2171: Intelligent Systems is 3rd of the 6 Technical Option Courses offered at RMIT. Also, this will be equivalent to MATH F212: Optimization offered as a core course or BITS F312: Neural Networks and Fuzzy Logic offered as Discipline Elective at BITS Pilani.
⑲	Course EEET2254: Communication Engineering 1 is 4th of the 6 Technical Option Courses offered in 4th year at RMIT. Also, this will be equivalent to EEE F311: Communication Systems offered at BITS Pilani as one of the core courses.
⑳	Course EEET 2100: Advanced Control Systems is one of the 6 Technical Option Courses offered at RMIT. Also, this will be the additional course which shall fulfill the RMIT requirement and may be treated as equivalent to EEE F422: Modern Control Systems offered at BITS Pilani.

Semester-wise Pattern for Students Admitted to B.E. Computer Science under BITS – RMIT Academy								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory	1	EEE	F111	Electrical Sciences	3
	CHEM	F111	General Chemistry	3	BITS	F112	Technical Report Writing	2
	MATH	F111	Mathematics I	3	MATH	F113	Probability and Statistics	3
	PHY	F110	Physics Laboratory	1	BITS	F111	Thermodynamics	3
	PHY	F111	Mechanics, Oscillations and Waves	3	CS	F111	Computer Programming ②	4
	BITS	F234	Introduction to Engineering Design ①	4				
				19				**20**
Summer Term								
			Humanities Elective					3
			Humanities Elective					3
II	MATH	F211	Mathematics III	3	ECON Or MGTS	F211 Or F211	Principles of Economics Or Principles of Management	3
	CS	F362	Programming Languages and Compiler Construction ③ BC1	4	BITS	F241	Systems Engineering Principles ⑤ DE1	4
	CS	F214	Logic in Computer Science BC2	3	CS	F241	Microprocessors & Interfacing BC6	4
	CS	F222	Discrete Structures for Comp Sc. BC3	3	CS	F212	Database Systems BC7	4
	CS	F213	Object Oriented Programming BC4	4	IS	F341	Software Engineering ⑥ DE2	4
	CS	F215	Digital Design BC5	4	BITS	F235	Digital Fundamentals ㉓ OE5	4
	BITS	F240	Introduction to Environmental and Sustainable Systems Engineering ④	3				
				24				**23**
III	EEET	2261	Computer architecture and organization ⑦ RC1	12	EEET	2096	Embedded System Design and Implementation ⑪ DE4	12
	ISYS	3459	System Architecture and Design ⑧ DE3	12	COSC	2758	Full Stack Development ⑫DE5	12
	COSC	2123	Algorithm and Analysis ⑨ RC2	12	EEET	2368	Network Fundamentals and Applications ⑬ RC3	12
			Optional Course ⑩ OE1	12	EEET	2250	Software Engineering Design ⑭ DE6	12
				48				48
IV	COSC	1107	Computing Theory ⑮ RC4	12	OENG	1168	Engineering Capstone Project Part B ⑲	12
	COSC	1114	Operating Systems Principles ⑯ RC5	12	OENG	2145	Embedded Systems: Operating Systems and Interfacing ⑳ OE3	12
	ISYS	1087	Software Testing ⑰ OE2	12	COSC	2299	Software Engineering: Process and Tools OE4 ㉑	12
	OENG	1167	Engineering Capstone Project Part A ⑱	12	OENG	1198	Professional Engineering Experience/ or elective ㉒	12
				48				**48**

Note: Units/Credit points earned for the course(s) in BITS Pilani and RMIT shall be considered towards degrees to be awarded by both institutions in accordance with the following:

1. To complete the BITS Pilani Degree, students need to complete a minimum total of 145 units with a minimum number of 44 courses (four courses with 16 units offered jointly by BITS and RMIT + twenty-six courses with 75 units (min.) offered by BITS in first two years, including summer term + fourteen courses with 54 equivalent units offered by RMIT). The Equivalent Unit is considered by assuming that a course of 3-4 units offered at BITS Pilani is equivalent to a 12-credit points course offered by RMIT.
2. To complete the RMIT Degree, students need to complete 384 credit points in total (four courses with 48 credit points offered jointly by BITS and RMIT + twelve mapped courses with 144 equivalent credit points offered by BITS in the first two years + sixteen courses with 192 credit points offered by RMIT).
3. Upon completion of all BITS Pilani Courses during Years 1 and 2 (including summer term, if any) at the BITS Campus, students will receive 144 credit points as an RMIT credit exemption against the twelve mapped courses to complete the RMIT Degree in accordance with RMIT's policies and procedures.
4. Upon completion of all RMIT Courses, students will receive 70 units of transfer credit for the twenty mapped courses to complete the BITS Pilani Degree in accordance with BITS' policies and procedures.
5. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani and RMIT.
6. The details of an encircled number given against the selected courses in the semester-wise pattern are given below:

Symbol	Description
①	Course BITS F234: Introduction to Engineering Design would be offered to BITS-RMIT Academy students in place of BITS F110: Engineering Graphics. This will also be equivalent to OENG1277: Introduction to Engineering Design offered at RMIT.
②	Course CS F111: Computer Programming would be offered to BITS-RMIT Academy students. This course is essential requirement for B.E. Computer Science of BITS Pilani.
③	Course CS F362: Programming Language and Compiler Construction is a new course proposed by BITS Pilani that combines two core courses: CS F301: Principles of Programming Language and CS F363: Compiler Construction. The revised course description of CS F362: Programming Language and Compiler Construction is given below: **CS F362 Programming Languages and Compiler Construction 4*** The notion of programmability, different languages, and paradigms, from procedural and shell scripting to modular programming, OOP, and functional programming. Programming Pragmatics: program structure, control flow, type systems, type checking, program scoping, iteration and recursions, procedure activation. Introduction to language processors: Basic Data and Control Flow of Compilers/Translator Filters/Interpreters. Concept of Integrated Development Environments, Software Development Toolchains. Engineering a compiler: lexical analysis technique, bottom-up LR parsing, introduction to syntax-directed translation, introduction to code generation.
④	Course BITS F240: Introduction to Environmental and Sustainable Systems Engineering will be offered to BITS-RMIT Academy students in place of BITS F225: Environmental Studies or BITS F237: STEM for Sustainable Development for all BITS-RMIT Higher Education Academy students. This will also be equivalent to CIVE1266 Introduction to Environmental and Sustainable Systems Engineering offered at RMIT.

⑤	Course BITS F241: Systems Engineering Principles will be offered to BITS-RMIT Academy students which is a required course at RMIT. This will also be equivalent to MIET2562 Systems Engineering Principles offered at RMIT. This will be considered as the 1st Disciplinary Elective (DE1) for BITS. This course will replace BITS F236: Foundations of Artificial Intelligence for STEM for all BITS-RMIT Higher Education Academy students.
⑥	Course IS 341: Software Engineering, which is an existing disciplinary elective course at BITS Pilani (considered as DE2), will be offered in the second year of this program. This will be equivalent to ISYS 3416 SE Fundamentals for IT, which is a core course at RMIT.
⑦	Course EEET 2261: Computer architecture and organization is the core course offered in 3rd year at RMIT. Also, this will be equivalent to CS F342: Computer Architecture (4 units) offered at BITS Pilani. Both are the core courses at the respective Institutes.
⑧	Course ISYS 3459: Systems Architecture and Design will be treated as equivalent to SA G653 Software Architecture: This will be considered as a Disciplinary Elective (DE3) for BITS Pilani.
⑨	Course COSC 2123: Algorithm and Analysis will be treated as equivalent to CS F211 Data Structures and Algorithms (4 units) and CS F364 Design and Analysis of Algorithms (3 units). COSC 2123 is a core course at RMIT and CS F211 as well as CS F364 are core courses at BITS Pilani.
⑩	RMIT will recommend an optional course to the students during their 3rd year from the listed courses. The students will have to select a technical option courses (i.e. courses that are within Minor Options for students at RMIT). This will be considered as an Open Elective (OE1) for BITS Pilani.
⑪	Course EEET 2096: Embedded System Design and Implementation is a core course at RMIT, which will be treated as a Disciplinary Elective (DE4) for BITS Pilani.
⑫	Course COSC 2758: Full Stack Development is the core course offered at RMIT only.
⑬	Course EEET 2368: Network Fundamentals is equivalent to CS F303 Computer Networks (4 units) at BITS Pilani. Both are the core courses at the respective Institutes.
⑭	Course EEET 2250: Software Engineering Design is a core course offered at RMIT only.
⑮	Course COSC 1107: Computing Theory is equivalent to CS F351 Theory of Computation at BITS Pilani (3 units). Both are the core courses at the respective Institutes.
⑯	Course COSC 1114: Operating Systems Principles is equivalent to CS F372 Operating Systems at BITS Pilani (3 units). Both are the core courses at the respective Institutes.
⑰	ISYS 1087: Software Testing is the core course offered at RMIT. This will be an Open Elective (OE2) for BITS Pilani.
⑱	Course OENG 1167: Engineering Capstone Project Part A is one of the required courses at RMIT. Also, this will be equivalent to BITS F456: Capstone Project I to be offered at BITS Pilani. All BITS-RMIT Academy students have to do two Capstone Projects in place of Practice School II/Thesis.
⑲	Course OENG 1168: Engineering Capstone Project Part B is one of the required courses at RMIT. Also, this will be equivalent to BITS F457: Capstone Project II to be offered at BITS Pilani. All BITS-RMIT Academy students have to do two Capstone Projects in place of Practice School II/Thesis
⑳	OENG 2145: Embedded Systems: Operating Systems and Interfacing is one of the required courses at RMIT. This will be an Open Elective (OE3) at BITS Pilani.
㉑	COSC 2299: Software Engineering: Process and Tools is a core course at RMIT. This will be an Open Elective (OE4) at BITS Pilani.
㉒	OENG 1198: Professional Engineering Experience/ or elective is one of the required courses at RMIT. This will be considered as a Humanities elective course required at BITS Pilani.
㉓	BITS F235/OENG1278 Digital Fundamentals is also a core requirement for Engineering

	degree at RMIT University. This course is required for Computer Science/Software Engineering cohort to earn RMIT Degree. This course would be offered in 2nd Year 2nd Semester and would be delivered by RMIT University. This will be considered as an open elective (OE5) course at BITS Pilani.

B. BITS Pilani – Iowa State University (ISU)-Dual Degree Programmes

The partnership includes a deeper engagement with the partner institution and students, including:

- Co-branded programmes with partner Institutions, including joint marketing, delivery, and operational responsibilities.
- Students are recruited through the existing BITSAT admissions process.
- Students will spend two years at BITS campuses before transferring to ISU in the USA.
- Students will have regular exposure to academics from partnering institutions in their respective locations.
- Students will receive dual degrees, one from each institution.
- Students complete their degree and obtain Post Study Work Authorization or Optimal Practical Training upto 24 months in the USA.
- Students will pay a substantially lower overall cost compared to the entirely US programmes.

Category wise structure of each program to fulfill Degree requirement of BITS Pilani for 2+2 International Collaborative First Degree Programmes offered under the BITS-ISU collaborations

Category	Courses to be offered at BITS Pilani		Courses to be offered at ISU (for BITS Requirement)		Total	
	Courses	Unit	Courses	Eq. Unit*	Courses	Unit
Humanities Elective	(0-3)	(0-9)	(0-3)	(0-9)	3	9
Science Foundation	6 (6)	12 (12)			6	12
Mathematics Foundation	4 (4)	12 (12)			4	12
Engineering Foundation	2 (2)	6 (6)			2	6
Technical Arts	(3-4)	(7-10)	(0-1)	(0-3)	4	10
General Awareness / Professional Courses	2 (2)	6 (6)			2	6
Sub-Total	**(17-21)**	**(43-55)**	**(0-4)**	**(0-12)**	**21**	**55**
Core	(7-11)	(26-37)	(3-8)	(14-24)	(10-16)	(33-48)
Discipline Elective	(0-4)	(0-15)	(0-4)	(0-15)	(4-9)	(12-27)
Sub-Total	**(7-15)**	**(26-52)**	**(3-12)**	**(14-39)**	**(14-20)**	**62**
Open Elective	(0-9)	(0-27)	(0-9)	(0-27)	(5-9)	(15-27)
Capstone Project			2	8	2	8

Grand Total	**(24-32)**	**(69-92)**	**(14-23)**	**(52-68)**	**(46-54)**	**144**

***Equivalent Unit:** Assuming a course of 3-4 units offered at BITS Pilani is equivalent to a 3-4 credit points course offered by ISU. The Unit of each Capstone Project offered at ISU is proposed to be considered equal to 4 units at BITS Pilani. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani.

Note:

1. Unlike other BITS students of regular 4-year First Degree Programmes, Students of the 2+2 International Collaborative First Degree Programmes need not to register for Practice School or Thesis. Such students will have to complete two Capstone Projects in place of Practice School II or First Degree Thesis to meet the requirements of their degree programmes.
2. Some of the courses which are offered at ISU may have different credit points, the grades earned by the students at ISU will be converted appropriately by making equivalency of the courses and by converting ISU credit points into BITS units, and the CGPA shall be calculated accordingly based on their grades earned in all the respective courses.
3. Table given above describes the general curricular structure for the 2+2 International Collaborative First Degree Programmes offered under the BITS-ISU collaborations and accordingly, the semesterwise pattern of each specific programme has designed.

The details of 2+2 International Collaborative First Degree (UG) Programmes with the Iowa State University (ISU) are given below:

- B.E. Computer Science at BITS Pilani, India and B.S. Computer Engineering at Iowa State University, Ames, USA
- B.E. Mechanical at BITS Pilani, India and B.S. Mechanical Engineering at Iowa State University, Ames, USA
- B.E. Electrical & Electronics at BITS Pilani, India and B.S. Electrical Engineering at Iowa State University, Ames, USA
- B.E. Electronics & Communication at BITS Pilani, India and B.S. Electrical Engineering at Iowa State University, Ames, USA.

Input Qualification:

(a) BITS Pilani minimum eligibility requirement

Applicant should also fulfil the minimum eligibility requirement of BITS Pilani for admission as follows:

(i) The applicant has passed the 12th examination of 10+2 system from a recognized National/State/International board or its equivalent with Physics, Chemistry and Mathematics (PCM) and adequate proficiency in English; Also, the applicant has obtained a minimum of aggregate 75% marks in PCM in 12th examination, with at least 60% marks in each of the PCM subjects.

(ii) The applicant undertakes the BITS Admission Test (BITSAT) and achieves a score that meets or exceeds the relevant cut-off score for admission to the BITS Award, as determined by BITS from time to time.

(b) Iowa State University minimum eligibility requirement

(i) Applicant should also fulfil the minimum eligibility requirement of Iowa State University for admission as follows:

(ii) Students should have been successfully admitted into the BITS-ISU 2+2 program by meeting its admission requirements as listed in Section (a) above.

(iii) In addition, students must maintain a BITS CGPA of at least 5.75 at the end of their first two years in the program in the BITS portion of the curriculum.

(iv) Students should also meet the English requirements listed below (meet any one of the criteria listed):

>=99 TOEFL or >= 7.5 IELTS or >=130 Duolingo or >=72 PTE or >=600 SAT Reading/Writing or >=26 ACT English

Mode of Admission:

Admissions will be made purely on merit. The merit position of the candidate will be based on the score obtained by the candidate in a Computer based Online Test (BITSAT) conducted by BITS, Pilani. The candidates should also fulfil the essential requirement of a minimum of aggregate **75% marks** in Physics, Chemistry and Mathematics subjects in the 12th examination with at least 60% marks in each of the Physics, Chemistry, and Mathematics subjects.

Upon successful completion of the BITSAT, students will make their programme selections, which will include the BITS-ISU programmes. Details of applicants who meet BITS admission criteria will be forwarded to Iowa State University for assessment against their eligibility criteria, such as proof of year 12 marks and proof of English language proficiency to the ISU standard.

Admission into the Academy for UAE (Dubai) based offerings will include details of applicants who meet BITS admission criteria and will be forwarded to ISU for assessment against ISU eligibility criteria, such as proof of year 12 marks and proof of English language proficiency to the ISU standard. Students that ISU deems to have met their criteria will be confirmed with BITS. Successful applicants will be provided admission offers.

According to the UGC Regulations mentioned above, dual-degree programmes will be those which are offered by both the Indian and foreign university in the same subject area and at the same qualification level. Degrees will be awarded separately and simultaneously from both universities. Prospective students must meet the admission requirements of both the Indian and Foreign universities and shall apply to and be admitted separately to both universities.

Duration:

The normal duration of the programme will be 8 semesters (Four Semesters and a summer term at any of the Campuses of BITS Pilani and another four Semesters at Iowa State University, Ames, USA).

Internship opportunities and Employment Scenario, etc.

- The program of study at Iowa State includes extensive hands-on experiences in the curriculum and is complemented by both research and employment opportunities during the academic semesters and summer. Engineering students take advantage of internships and cooperative education opportunities that provide paid and supervised work experience to complement formal academic classwork. The College of Engineering Career Services office provides career advising and preparation support for internships, co-ops and post-graduation employment.
- International students on a study visa (F-1) can also pursue off-campus employment opportunities prior to the completion of an academic program or degree by availing of the Curricular Practical Training (CPT), for example for internships and co-ops during the summer or academic semester. Students are eligible for upto 365 days of CPT while completing their bachelor's degree.
- Post-completion Optional Practical Training (OPT) is a 12-month period of work authorization (up to 24 months for engineering fields), or practical training. OPT is an opportunity for F-1 students to take what they learned in the classroom and apply their knowledge to a work setting. Generally, these work experiences are off-campus or for non-student positions at ISU. International students at Iowa State should work with the International Student and Scholar's office on learning more and applying for CPT or OPT.

The four dual degree programmes in collaboration with Iowa State University have launched in the Academic Year 2024-25 as part of the partnership arrangement. The ISU engineering programmes for this partnership are fully accredited by ABET and require capstone projects. These are either industry-sponsored or faculty led research projects. Students will apply their technical knowledge, research, design and professional engineering skills to either discipline-specific, or cross- disciplinary engineering problems, through robust research and established engineering design processes. The degree is internationally recognised, and graduates are able to practice as professional engineers in many countries around the world.

The collaborative 'dual degree' programmes at the international level are being offered in collaboration with Iowa State University in the same specialization and at the same qualification level. In this 4-year collaborative 'dual degree' programme, students will spend the first two years alongwith a summer term (if required) at BITS Pilani campuses before getting transferred to Iowa State University in the USA for the remaining two years (i.e., years 3 and 4) of their study period. The courses mentioned in the semester-wise pattern in years 1 and 2, along with the summer term (if any), will be offered at BITS Pilani Campuses, whereas those courses specified in years 3 and 4 will be offered at ISU. The Equivalent Unit may be considered by assuming that a course of 1 unit offered at BITS Pilani is equivalent to a 1 credit point course offered by ISU. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani and ISU. Accordingly, the ISU credit points will be converted into BITS course units and vice versa by making appropriate equivalency of these courses.

Semester-wise Pattern for Students Admitted to B.E. Computer Science at BITS Pilani and B.S. Computer Engineering at ISU								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F111	General Biology①	3	BIO	F110	Biology Laboratory①	1
	CHEM	F110	Chemistry Laboratory	1	MATH	F112	Mathematics II⑦	3
	CHEM	F111	General Chemistry	3	ME	F112	Workshop Practice	2
	MATH	F111	Mathematics I②	3	MATH	F113	Probability and Statistics⑧	3
	PHY	F110	Physics Laboratory③	1	EEE	F111	Electrical Sciences⑨	3
	PHY	F111	Mechanics, Oscillations and Waves④	3	BITS	F111	Thermodynamics⑩	3
	BITS	F110	Engineering Graphics⑤	2	CS	F111	Computer Programming ⑪	4
	BITS	112	Technical Report Writing ⑥	2				
				18				19
Year	**Summer Term**							U
			Humanities Elective⑫					3
			Humanities Elective⑬					3
								6
Year	**First Semester**			**U**	**Second Semester**			U
II	MATH	F211	Mathematics III ⑭	3	ECON Or MGTS	F211 Or F211	Principles of Economics⑳ Or Principles of Management	3
	CS	F213	Object Oriented Programming⑮	4	CS	F211	Data Structures & Algorithms㉑	4
	CS	F214	Logic in Computer Science⑯	3	CS	F212	Database Systems㉒	4
	CS	F215	Digital Design⑰	4	CS	F241	Microprocessors & Interfacing ㉓	4
	CS	F222	Discrete Structures for Computer Science⑱	3	CS	F351	Theory of Computation㉔	3
			Humanities Elective⑲	3	BITS	F225	Environmental Studies㉕	3
				20				21
Year	**First Semester**			**U**	**Second Semester**			U
III	CprE	2610	Transfer Orientation	R	ComS	3110	Introduction to the Design and Analysis of Algorithms㉛	3
	CprE	1660	Professional Programming㉖	R	ENGL	3140	Technical Communication㉜	3
	LIB	1600	Introduction to College Level Research	1	ComS	3420	Principles of Programming Languages ㉝	3
	UST	1100	International First-Year Experience Seminar	1	STAT	3300	Probability and Statistics for Computer Science ㉞	3
	CprE	2320	Professional and Ethical Issues in Electrical and Computer Engineering ㉗	3			3000-Level Math Course㉟	4
	ENGL	2500	Written, Oral, Visual, and Electronic Composition㉘	3				
	CprE	3810	Computer Organization and Assembly Level Programming ㉙	4				
	EE	2300	Electronic Circuits and Systems㉚	4				
				16				16
Year	**First Semester**			**U**	**Second Semester**			U
IV	CprE	4910	Senior Design Project I and Professionalism ㊱	3	CprE	4920	Senior Design Project II㊵	2
	CprE	4940	Portfolio Assessment	R	CprE	4890	Computer Networks and Data Communication㊶	3
	CprE	3080	Operating Systems: Principles and Practice㊲	4			CprE Elective ㊷	4
	ComS	3090	Software Development Practices ㊳	3	ComS	4400	Principles and Practice of Compiling㊸	3
			CprE Elective ㊴	3				
				13				12

Course sequences to be taken in years 3 and 4 at ISU are tentative and may change, if required. Academic advisors at ISU will work with students to set exact schedules upon entry to ISU.

Note: Units/Credit points earned for the course(s) in BITS Pilani and ISU shall be considered towards degrees to be awarded by both institutions in accordance with the following:

1. To complete the BITS Pilani Degree, students need to complete a minimum total of 144 units with a minimum number of 47 courses (twenty-Nine courses with 84 units (min.) offered by BITS in first two years + Eighteen courses with 60 equivalent units offered by ISU). The Equivalent Unit is considered by assuming that a course of 1 units offered at BITS Pilani is equivalent to a 1 credit points course offered by ISU.

2. To complete the ISU Degree, students need to complete 127 credit points in total (3 waved courses with 12 credit points + 24 mapped courses with 76 equivalent credit points offered by BITS in the first two years + 22 courses with 57 credit points offered by ISU).

3. Upon completion of all BITS Pilani Courses during Years 1 and 2 (including summer term, if any) at a given BITS Campus, students will receive 12+76 = 88 credit points as an ISU credit exemption against the 3 waived + 24 mapped Courses to complete the ISU Degree in accordance with ISU's policies and procedures.

4. Upon completion of all ISU Courses in 3rd and 4th year, students will receive 60 units of transfer credit for the Eighteen mapped courses to complete the BITS Pilani Degree in accordance with BITS' policies and procedures.

5. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani and ISU.

6. The details of an encircled number given against the selected courses in the semester-wise pattern are given below:

Symbol	Description
①	BIO F111: General Biology and BIO F110: Biology Laboratory is the compulsory foundation courses at BITS. These two courses will be considered as an equivalent to BIOL 1010: Introductory Biology to fulfil the general education elective requirement at ISU. Thus, it will fulfill the requirement of 1st course under General Education Requirement Elective out of the total 6 courses required under this category at ISU.
②	MATH F111: Mathematics I is the compulsory foundation course at BITS. It will be be considered as an equivalent to MATH 2650: Calculus III to fulfil the ISU requirement. MATH 2650 is considered to fill credit deficiency in ISU Basic Program.
③	PHY F110: Physics Laboratory is the compulsory foundation course at BITS. It will be considered as an equivalent to PHYS2310L: Introduction to Classical Physics I Laboratory to fulfil the ISU requirement.
④	PHY F111: Mechanics, Oscillations and Waves is the compulsory foundation course at BITS. It will be considered as an equivalent to PHYS 2310: Introduction to Classical Physics I to fulfil the ISU requirement.
⑤	BITS F110: Engineering Graphics is the compulsory foundation course at BITS. It will be considered as an equivalent to ME 1700: Engineering Graphics and Introductory Design to fulfil the ISU requirement.
⑥	Course BITS F112: Technical Report Writing is a required course to fulfil BITS requirement.
⑦	Course MATH F112: Mathematics II is the compulsory foundation course at BITS. It will

Symbol	Description
①	BIO F111: General Biology and BIO F110: Biology Laboratory is the compulsory foundation courses at BITS. These two courses will be considered as an equivalent to BIOL 1010: Introductory Biology to fulfil the general education elective requirement at ISU. Thus, it will fulfill the requirement of 1st course under General Education Requirement Elective out of the total 6 courses required under this category at ISU.
②	MATH F111: Mathematics I is the compulsory foundation course at BITS. It will be be considered as an equivalent to MATH 2650: Calculus III to fulfil the ISU requirement. MATH 2650 is considered to fill credit deficiency in ISU Basic Program.
③	PHY F110: Physics Laboratory is the compulsory foundation course at BITS. It will be considered as an equivalent to PHYS2310L: Introduction to Classical Physics I Laboratory to fulfil the ISU requirement.
④	PHY F111: Mechanics, Oscillations and Waves is the compulsory foundation course at BITS. It will be considered as an equivalent to PHYS 2310: Introduction to Classical Physics I to fulfil the ISU requirement.
⑤	BITS F110: Engineering Graphics is the compulsory foundation course at BITS. It will be considered as an equivalent to ME 1700: Engineering Graphics and Introductory Design to fulfil the ISU requirement.
	be considered as an equivalent to MATH 2070: Matrices and Linear Algebra to fulfil the ISU requirement.
⑧	Course MATH F113: Probability and Statistics is the compulsory foundation course at BITS. It will be considered as an equivalent to STAT 3050: Engineering Statistics to fulfil the ISU requirement. MATH 2650 is considered to fill credit deficiency in ISU Basic Program.
⑨	Course EEE F111: Electrical Sciences is the compulsory foundation course at BITS. It will be considered as an equivalent to EE 2010: Electric Circuit to fulfil the ISU requirement.
⑩	Course BITS F111: Thermodynamics is the compulsory foundation course at BITS. It will be considered as an equivalent to ME 2310: Engineering Thermodynamics I, to fulfil the non-CPRE Tech Elective requirement at ISU. Thus, it will fulfill the requirement of 1st course as non-CPRE Tech Elective requirement at ISU.
⑪	Course CS F111: Computer Programming is the compulsory foundation course at BITS. It will be considered as an equivalent to CprE 1850: Introduction to Computer Engineering and Problem Solving I is the foundation course offered at ISU. Both are the foundation courses at the respective Institutes.
⑫	One of the Humanities Elective is a required course at BITS. The course will be considered as an equivalent to one of the General Education Elective to fulfil the general education elective requirement at ISU. Thus, it will fulfill the requirement of 2nd course under General Education Requirement Elective out of the total 6 courses required under this category at ISU.
⑬	One of the Humanities Elective is a required course at BITS. The course will be considered as an equivalent to one of the General Education Elective to fulfil the general education elective requirement at ISU. Thus, it will fulfill the requirement of 3rd course under General Education Requirement Elective out of the total 6 courses required under this category at ISU.
⑭	Course MATH F211: Mathematics III is the compulsory foundation course at BITS. It will be considered as an equivalent to MATH 2670: Elementary Differential Equations and Laplace Transforms, a foundation course offered at ISU. Mathematics I, II and III offered at BITS may fulfill mathematics requirements of ISU.
⑮	Course CS F213: Object Oriented Programming is the required core course at BITS Pilani. It will be considered as equivalent to ComS 2270: Object-oriented Programming, a core

Symbol	Description
①	BIO F111: General Biology and BIO F110: Biology Laboratory is the compulsory foundation courses at BITS. These two courses will be considered as an equivalent to BIOL 1010: Introductory Biology to fulfil the general education elective requirement at ISU. Thus, it will fulfill the requirement of 1st course under General Education Requirement Elective out of the total 6 courses required under this category at ISU.
②	MATH F111: Mathematics I is the compulsory foundation course at BITS. It will be be considered as an equivalent to MATH 2650: Calculus III to fulfil the ISU requirement. MATH 2650 is considered to fill credit deficiency in ISU Basic Program.
③	PHY F110: Physics Laboratory is the compulsory foundation course at BITS. It will be considered as an equivalent to PHYS2310L: Introduction to Classical Physics I Laboratory to fulfil the ISU requirement.
④	PHY F111: Mechanics, Oscillations and Waves is the compulsory foundation course at BITS. It will be considered as an equivalent to PHYS 2310: Introduction to Classical Physics I to fulfil the ISU requirement.
⑤	BITS F110: Engineering Graphics is the compulsory foundation course at BITS. It will be considered as an equivalent to ME 1700: Engineering Graphics and Introductory Design to fulfil the ISU requirement.
	course offered at ISU.
⑯	Course CS F214: Logic in Computer Science is the required core course at BITS. It will be considered to fulfil as one of the CPRE Comp Think Elective requirement at ISU. Thus, it will fulfill the requirement of 1st course under Computational Thinking Elective out of 3 required at ISU.
⑰	Course CS F215: Digital Design is the required core course at BITS. It will be considered as equivalent to CprE 2810: Digital Logic, a required core course offered at ISU.
⑱	Course CS F222: Discrete Structures for Computer Science is the required core course at BITS. It will be considered as equivalent to CprE 3100: Theoretical Foundations of Computer Engineering, a required core course offered at ISU.
⑲	One of the Humanities Elective is a required course at BITS. It will be considered as an equivalent to one of the General Education Elective to fulfil the general education elective requirement at ISU. Thus, it will fulfill the requirement of 4th course under General Education Requirement Elective out of the total 6 courses required under this category at ISU.
⑳	ECON F211: Principles of Economics is a compulsory foundation course at BITS, and should be selected to count toward a general education elective category at ISU. It will be considered as an equivalent to ECON 1010: Principles of Microeconomics to fulfil the general education elective requirement at ISU. Thus, it will fulfill the requirement of 5th course under General Education Requirement Elective out of the total 6 courses required under this category at ISU.
㉑	Course CS F211: Data Structures & Algorithms is the required core course at BITS. It will be considered as equivalent to ComS 2280: Introduction to Data Structures, a required core course offered at ISU. Both are the core courses at the respective Institutes.
㉒	CS F212: Database Systems is the required core course at BITS. It be considered as one of the non-CPRE Tech Elective requirement at ISU. Thus, it will fulfill the requirement of 2nd course as non-CPRE Tech Elective requirement at ISU.
㉓	Course CS F241: Microprocessors & Interfacing is the required core course at BITS. It will be considered as equivalent to CprE 2880: Embedded Systems I, a required core course offered at ISU. Both are the core courses at the respective Institutes
㉔	Course CS F351: Theory of Computations is a required core course at BITS Pilani. It will be considered as equivalent to ComS 3310: Theory of Computing and will be counted as 2nd Computational Thinking Elective out of 3 required at ISU.

Symbol	Description
①	BIO F111: General Biology and BIO F110: Biology Laboratory is the compulsory foundation courses at BITS. These two courses will be considered as an equivalent to BIOL 1010: Introductory Biology to fulfil the general education elective requirement at ISU. Thus, it will fulfill the requirement of 1st course under General Education Requirement Elective out of the total 6 courses required under this category at ISU.
②	MATH F111: Mathematics I is the compulsory foundation course at BITS. It will be be considered as an equivalent to MATH 2650: Calculus III to fulfil the ISU requirement. MATH 2650 is considered to fill credit deficiency in ISU Basic Program.
③	PHY F110: Physics Laboratory is the compulsory foundation course at BITS. It will be considered as an equivalent to PHYS2310L: Introduction to Classical Physics I Laboratory to fulfil the ISU requirement.
④	PHY F111: Mechanics, Oscillations and Waves is the compulsory foundation course at BITS. It will be considered as an equivalent to PHYS 2310: Introduction to Classical Physics I to fulfil the ISU requirement.
⑤	BITS F110: Engineering Graphics is the compulsory foundation course at BITS. It will be considered as an equivalent to ME 1700: Engineering Graphics and Introductory Design to fulfil the ISU requirement.
㉕	The course BITS F225: Environmental Studies is a required course under general awareness courses at BITS Pilani. It will be considered as equivalent to ENVS 3340 Environmental Ethics course offered at ISU under General Education Requirement Elective Category. Thus, it will fulfill the requirement of 6th course under General Education Requirement Elective out of the total 6 courses required under this category at ISU.
㉖	Course CprE 1660: Professional Programming is the core course offered at ISU. Also, this course will be 1st Open Elective (OPEL) out of total required 5 at BITS.
㉗	Course CprE 2320: Professional and Ethical Issues in Electrical and Computer Engineering is the core course offered at ISU. Also, this course will be treated as 1st Discipline Elective course required at BITS Pilani.
㉘	Course ENGL 2500: Written, Oral, Visual, and Electronic Composition is the core course offered at ISU. Also, this course will be 2nd Open Elective (OPEL) out of total required 5 at BITS.
㉙	Course CprE 3810: Computer Organization and Assembly Level Programming is the core course offered at ISU. Also, this course will be considered as equivalent to CS F342: Computer Architecture a required core course offered at BITS Pilani. Both are the core courses at the respective Institutes.
㉚	Course EE 2300: Electronic Circuits and Systems is the core course offered at ISU. Also, this course will be treated as 2nd Discipline Elective course required at BITS Pilani.
㉛	Course ComS 3110: Introduction to the Design and Analysis of Algorithms is the core course offered at ISU. Also, this course will be considered as equivalent to CS F364: Design and Analysis of Algorithms a required core course offered at BITS Pilani. Both are the core courses at the respective Institutes.
㉜	Course ENGL 3140: Technical Communication would be a course under the requirement of Communication requirement at ISU. Also, will be treated as 3rd Open Elective (OPEL) out of total required 5 at BITS.
㉝	BITS-ISU Students shall be advised to take the course ComS 3420: Principles of Programming Language as 3rd Computational Thinking Electives out of 3 required at ISU and will be treated as equivalent a required core course offered at BITS, namely CS F301: Principles of Programming Languages.
㉞	Course STAT 3300: Probability and Statistics for Computer Science is the core course offered at ISU. Also, this course will be treated as 4th Open Elective (OPEL) to complete

Symbol	Description
①	BIO F111: General Biology and BIO F110: Biology Laboratory is the compulsory foundation courses at BITS. These two courses will be considered as an equivalent to BIOL 1010: Introductory Biology to fulfil the general education elective requirement at ISU. Thus, it will fulfill the requirement of 1st course under General Education Requirement Elective out of the total 6 courses required under this category at ISU.
②	MATH F111: Mathematics I is the compulsory foundation course at BITS. It will be be considered as an equivalent to MATH 2650: Calculus III to fulfil the ISU requirement. MATH 2650 is considered to fill credit deficiency in ISU Basic Program.
③	PHY F110: Physics Laboratory is the compulsory foundation course at BITS. It will be considered as an equivalent to PHYS2310L: Introduction to Classical Physics I Laboratory to fulfil the ISU requirement.
④	PHY F111: Mechanics, Oscillations and Waves is the compulsory foundation course at BITS. It will be considered as an equivalent to PHYS 2310: Introduction to Classical Physics I to fulfil the ISU requirement.
⑤	BITS F110: Engineering Graphics is the compulsory foundation course at BITS. It will be considered as an equivalent to ME 1700: Engineering Graphics and Introductory Design to fulfil the ISU requirement.
	requirements at BITS.
㉟	This course would be a course under the requirement of 3000-Level Math course required at ISU. BITS-ISU students should select this course from the pool of 3000-Level Math courses offered at ISU. Also, will be treated as 5th Open Elective (OPEL) out of total required 5 at BITS.
㊱	Course BITS F456: Capstone Project I is the required course offered at BITS Pilani. Also, this course will be considered as equivalent to the course CPRE 4910: Senior Design Project I and Professionalism. This is the 1st Capstone Project out of 2 required at BITS.
㊲	Course CprE 3080: Operating Systems: Principles and Practice is the core course offered at ISU. Also, this course will be considered as equivalent to CS F372: Operating Systems a required core course offered at BITS Pilani. Both are the core courses at the respective Institutes.
㊳	Course ComS 3090: Software Development Practices is the core course offered at ISU. Also, will be treated as an Extra Open Elective (OPEL) out of total required 5 at BITS.
㊴	This course would be the 1st CprE Electives out of 3 required at ISU. Students should select this course from the pool of CprE electives offered at ISU. Also, will be treated as 3rd Discipline Elective course required at BITS Pilani.
㊵	Course BITS F457: Capstone Project II is the required course offered at BITS Pilani. Also, this course will be considered as equivalent to the course CPRE 4920: Senior Design Project II. This is the 2nd Capstone Project out of 2 required at BITS.
㊶	BITS-ISU Students shall be advised to take the course CprE 4890: Computer Networks and Data Communication as 2nd CprE Electives out of four required at ISU and will be treated as equivalent to a required core course offered at BITS, namely CS F303: Computer Networks.
㊷	This course would be the 3rd CprE Electives out of 3 required at ISU. Students should select this course from the pool of CprE electives offered at ISU. Also, will be treated as 4th Discipline Elective course required at BITS Pilani.
㊸	BITS-ISU Students shall be advised to take the course ComS 4400: Principles and Practice of Compiling as Technical Electives course required at ISU and will be treated as equivalent to a required core course offered at BITS, namely CS F363: Compiler Construction.

Semester-wise Pattern for Students Admitted to B.E. Electronics and Communications under BITS – ISU								
Year	**First Semester**			**U**	**Second Semester**			U
I	BIO	F110	Biology Laboratory ①	1	BITS	F112	Technical Report Writing	2
	BIO	F111	General Biology①	3	MATH	F112	Mathematics II ⑥	3
	CHEM	F110	Chemistry Laboratory	1	ME	F112	Workshop Practice	2
	CHEM	F111	General Chemistry	3	MATH	F113	Probability and Statistics⑦	3
	MATH	F111	Mathematics I②	3	EEE	F111	Electrical Sciences⑧	3
	PHY	F110	Physics Laboratory③	1	BITS	F111	Thermodynamics⑨	3
	PHY	F111	Mechanics, Oscillations and Waves④	3	CS	F111	Computer Programming	4
	BITS	F110	Engineering Graphics⑤	2				
				18				**19**
Year	**First Semester**			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III ⑩	3	ECON Or MGTS	F211 Or F211	Principles of Economics⑮ Or Principles of Management	3
	ECE	F211	Electrical Machines	4	ECE	F241	Microprocessors & Interfacing	4
	ECE	F212	Electromagnetic Theory ⑪	3	ECE	F242	Control Systems⑯	3
	ECE	F215	Digital Design⑫	4	ECE	F243	Signals & Systems⑰	3
	ECE	F214	Electronic Devices⑬	3	ECE	F244	Microelectronic Circuits	3
	ECE	F314	Electromagnetic Fields & Microwave Engineering	3	BITS	F225	Environmental Studies⑱	3
			Humanities⑭	3			Humanities Elective⑲	3
				23				**22**
	Summer Term							
	ECE	F341	Analog Electronics					4
	ECE	F344	Information Theory and Coding⑳					3
			Humanities Elective					3
								10
Year	**First Semester**			**U**	**Second Semester**			**U**
III	EE	2610	Transfer Orientation	R	CprE	2880	Embedded Systems I㉓	4
	EE	1660	Professional Programming	R	EE	2320	Professional and Ethical Issues in Electrical and Computer Engineering㉔	3
	LIB	1600	Introduction to College Level Research	1	PHYS	2320	Introduction to Classical Physics II㉕	4
	UST	1100	International I-Year Experience Seminar	1	ENGL	3140	Technical Communication㉖	3
	EE	4900	Independent Study (CPRE 2810 Lab)	1			3000-Level Math Course ㉗	4
	EE	1850	Introduction to Electrical Engineering and Problem-Solving I	3				
	EE	2300	Electronic Circuits and Systems㉑	4				
	EE	2850	Problem Solving Methods and Tools for Electrical Engineering㉒	4				
	ENGL	2500	Written, Oral, Visual, and Electronic Composition	3				
				17				**18**
IV	EE	4910	Senior Design Project I and Professionalism ㉘	3	EE	4920	Senior Design Project II ㉛	2
	EE	4940	Portfolio Assessment	R	EE	4240	Introduction to Digital Signal Processing㉜	4
	EE	3220	Probabilistic Methods for Electrical Engineers	3	CPRE	4890	Computer Networking and Data Communications㉝	4
	EE	3240	Signals and Systems II ㉙	4	EE	4230	Communication Systems Laboratory	1
	EE	3030	Energy Systems and Power Electronics	3			3000-Level Math Course ㉞	4
	EE	3210	Communication Systems I㉚	3				
				16				**15**

Course sequences to be taken in years 3 and 4 at ISU are tentative and may change, if required. Academic advisors at ISU will work with students to set exact schedules upon entry to ISU.

Note: Units/Credit points earned for the course(s) in BITS Pilani and ISU shall be considered towards degrees to be awarded by both institutions in accordance with the following:

1. To complete the BITS Pilani Degree, students need to complete a minimum total of 144 units with a minimum number of 46 courses (thirty-two courses with 92 units (min.) offered by BITS in first two years + Fourteen courses with 52 equivalent units offered by ISU). The Equivalent Unit is considered by assuming that a course of 1 units offered at BITS Pilani is equivalent to a 1 credit points course offered by ISU.

2. To complete the ISU Degree, students need to complete 128 credit points in total (3 waved courses with 12 units + 20 mapped courses with 65 equivalent credit points offered by BITS in the first two years + 25 courses with 66 credit points offered by ISU).

3. Upon completion of all BITS Pilani Courses during Years 1 and 2 (including summer term, if any) at the BITS Campus, students will receive 12+65 = 77 credit points as an ISU credit exemption against the 3 waived + 20 mapped Courses to complete the ISU Degree in accordance with ISU's policies and procedures.

4. Upon completion of all ISU Courses, students will receive 52 units of transfer credit for the 14 mapped courses to complete the BITS Pilani Degree in accordance with BITS' policies and procedures.

5. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani and ISU.

6. The details of an encircled number given against the selected courses in the semester-wise pattern are given below:

Symbol	Description
①	BIO F111: General Biology and BIO F110: Biology Laboratory is the compulsory foundation courses at BITS. These two courses will be considered as an equivalent to BIOL 1010: Introductory Biology to fulfil the general education elective requirement at ISU. Thus, it will fulfill the requirement of 1st course under General Education Requirement Elective out of the total 6 courses required under this category at ISU.
②	MATH F111: Mathematics I is the compulsory foundation course at BITS. It will be be considered as an equivalent to MATH 2650: Calculus III to fulfil the ISU requirement. MATH 2650 is considered to fill credit deficiency in ISU Basic Program.
③	PHY F110: Physics Laboratory is the compulsory foundation course at BITS. It will be considered as an equivalent to PHYS2310L: Introduction to Classical Physics I Laboratory to fulfil the ISU requirement.
④	PHY F111: Mechanics, Oscillations and Waves is the compulsory foundation course at BITS. It will be considered as an equivalent to PHYS 2310: Introduction to Classical Physics I to fulfil the ISU requirement.
⑤	BITS F110: Engineering Graphics is the compulsory foundation course at BITS. It will be considered as an equivalent to ME 1700: Engineering Graphics and Introductory Design to fulfil the ISU requirement.
⑥	Course MATH F112: Mathematics II is the compulsory foundation course at BITS. It will be considered as an equivalent to MATH 2070: Matrices and Linear Algebra to fulfil the ISU requirement.

Symbol	Description
⑦	Course MATH F113: Probability and Statistics is the compulsory foundation course at BITS. It will be considered as an equivalent to STAT 3050: Engineering Statistics to fulfil the ISU requirement. MATH 2650 is considered to fill credit deficiency in ISU Basic Program.
⑧	Course EEE F111: Electrical Sciences is the compulsory foundation course at BITS. It will be considered as an equivalent to EE 2010: Electric Circuit to fulfil the ISU requirement.
⑨	Course BITS F111: Thermodynamics is the compulsory foundation course at BITS. It will be considered as an equivalent to ME 2310: Engineering Thermodynamics I offered at ISU.
⑩	Course MATH F211: Mathematics III is the compulsory foundation course at BITS. It will be considered as an equivalent to MATH 2670: Elementary Differential Equations and Laplace Transforms, a foundation course offered at ISU. Mathematics I, II and III offered at BITS may fulfill mathematics requirements of ISU.
⑪	Course ECE F212: Electromagnetic Theory is the required core course at BITS. It will be considered as an equivalent to EE 3110: Electromagnetic Fields and Waves a required course offered at ISU.
⑫	Course ECE F215: Digital Design is the required core course at BITS. It will be considered as an equivalent to CprE 2810: Digital Logic a required course offered at ISU.
⑬	Course ECE F214: Electronic Devices is the required core course at BITS. It will be considered as an equivalent to EE 3320: Semiconductor Materials and Devices a required course offered at ISU.
⑭	This would be the 1st Humanities Elective (HUEL) out of total required 3 HUELs at BITS. Students should select this course from the pool of Humanities electives (defined for BITS-ISU students) offered at BITS in such a way that the selected course will also fulfill the requirement of a course at ISU offered under General Education Requirement Elective Category.
⑮	Course ECON F211: Principles of Economics is the compulsory foundation course at BITS. It will be considered as an equivalent to ECON 1010: Principles of Microeconomics a ECON elective course offered at ISU.
⑯	Course ECE F242: Control Systems is the required core course at BITS. It will be considered as an equivalent to EE 4750: Automatic Control System an EE Elective course offered at ISU.
⑰	Course ECE F243: Signals and Systems is the required core course at BITS. It will be considered as an equivalent to EE 2240: Signals and Systems I is a required course offered at ISU.
⑱	The course BITS F225: Environmental Studies is a required course under general awareness courses at BITS Pilani. This course will be considered as equivalent to ENVS 3340: Environmental Ethics course offered at ISU under General Education Requirement Elective Category.
⑲	This would be the 2nd Humanities Elective (HUEL) out of total required 3 HUELs at BITS. Students should select this course from the pool of Humanities electives (defined for BITS-ISU students) offered at BITS in such a way that the selected course will also fulfill the requirement of a course at ISU offered under General Education Requirement Elective Category.
⑳	The course ECE F344: Information Theory and Coding is a required core course offered at BITS Pilani. This course will also fulfill the requirement of a course at ISU offered under EE Elective Category.
㉑	Course EE 2300: Electronic Circuits and Systems is the required course offered at ISU. Also, this course will be treated as 1st Discipline Elective course required at BITS Pilani.
㉒	Course EE 2850: Problem Solving Methods and Tools for Electrical Engineering is the required course offered at ISU. Also, this course will be treated as 2nd Discipline Elective course required at BITS Pilani.
㉓	Course CprE 2880: Embedded Systems I is the required course offered at ISU. Also, this course will be treated as 3rd Discipline Elective course required at BITS Pilani.

Symbol	Description
㉔	Course EE 2320: Professional and Ethical Issues in Electrical and Computer Engineering is the core course offered at ISU. Also, this course will be 1st Open Elective (OPEL) out of total required 5 at BITS.
㉕	Course PHYS 2320: Introduction to Classical Physics II is the core course offered at ISU. Also, this course will be treated as 2nd Open Elective (OPEL) out of total required 5 at BITS.
㉖	Course ENGL 3140: Technical Communication is the core course offered at ISU. Also, this course will be treated as 3rd Open Elective (OPEL) out of total required 5 at BITS.
㉗	This course would be a course under the requirement of 3000-Level Math course required at ISU. BITS-ISU students should select this course from the pool of 3000-Level Math courses offered at ISU. Also, this will be treated as 4th Open Elective (OPEL) out of total required 5 at BITS.
㉘	Course BITS F456: Capstone Project I is the required course offered at BITS Pilani. Also, this course can be considered as equivalent to the course EE 4910: Senior Design Project I and Professionalism. This is the 1st Capstone Project out of 2 required at BITS.
㉙	Course EE 3240: Signals and Systems II is the required course offered at ISU. Also, this course will be treated as 4th Discipline Elective course required at BITS Pilani.
㉚	Course EE 3210: Communication Systems I is the EE sequence course offered at ISU. Also, this course can be considered as equivalent to ECE F311: Communication Systems offered at BITS Pilani. Both are the core courses at the respective Institutes.
㉛	Course BITS F457: Capstone Project II is the required course offered at BITS Pilani. Also, this course can be considered as equivalent to the course EE 4920: Senior Design Project II. This is the 2nd Capstone Project out of 2 required at BITS.
㉜	Course EE 4240: Introduction to Digital Signal Processing is the EE/CprE Electives course required at ISU. Also, this course will be treated as equivalent core course offered at BITS, namely ECE F434: Digital Signal Processing.
㉝	Course CPRE 4890: Computer Networking and Data Communications is the EE sequence course offered at ISU. Also, this course will be treated as equivalent core course offered at BITS, namely ECE F343: Communication Networks.
㉞	This course would be a course under the requirement of 3000-Level Math course required at ISU. BITS-ISU students should select this course from the pool of 3000-Level Math courses offered at ISU. Also, this will be treated as 5th Open Elective (OPEL) out of total required 5 at BITS.

Semester-wise Pattern for Students Admitted to B.E. Electrical and Electronics at BITS Pilani and B.S. Electrical Engineering at ISU								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F111	General Biology①	3	BIO	F110	Biology Laboratory ①	1
	CHEM	F110	Chemistry Laboratory	1	MATH	F112	Mathematics II ⑥	3
	CHEM	F111	General Chemistry	3	ME	F112	Workshop Practice	2
	MATH	F111	Mathematics I②	3	MATH	F113	Probability and Statistics⑦	3
	PHY	F110	Physics Laboratory③	1	EEE	F111	Electrical Sciences ⑧	3
	PHY	F111	Mechanics, Oscillations and Waves④	3	BITS	F111	Thermodynamics⑨	3
	BITS	F110	Engineering Graphics⑤	2	CS	F111	Computer Programming	4
	BITS	112	Technical Report Writing	2				
				18				**19**
II	MATH	F211	Mathematics III ⑩	3	ECON Or MGTS	F211 Or F211	Principles of Economics ⑭ Or Principles of Management	3
	EEE	F211	Electrical Machines	4	EEE	F241	Microprocessors & Interfacing	4
	EEE	F212	Electromagnetic Theory ⑪	3	EEE	F242	Control Systems ⑮	3
	EEE	F215	Digital Design⑫	4	EEE	F243	Signals & Systems⑯	3
	EEE	F214	Electronic Devices⑬	3	EEE	F244	Microelectronic Circuits	3
	MATH ME	F212 OR F344	Optimization OR Engineering Optimization	3 2	BITS	F225	Environmental Studies⑰	3
				20				**19**
Summer Term								
	EEE	F341	Analog Electronics					4
			Humanities Elective⑱					3
			Humanities Elective⑲					3
								10
III	EE	2610	Transfer Orientation	R	CprE	2880	Embedded Systems I㉓	4
	EE	1660	Professional Programming	R	EE	2320	Professional and Ethical Issues in Electrical and Computer Engineering㉔	3
	LIB	1600	Introduction to College Level Research	1	PHYS	2320	Introduction to Classical Physics II㉕	4
	UST	1100	International I-Year Experience Seminar	1	ENGL	3140	Technical Communication㉖	3
	EE	4900	Independent Study (CprE 2810 Lab)	1	EE	3300	Integrated Electronics㉗	4
	EE	1850	Introduction to Electrical Engineering and Problem-Solving I	3				
	EE	2300	Electronic Circuits and Systems⑳	4				
	EE	2850	Problem Solving Methods and Tools for Electrical Engineering㉑	4				
	ENGL	2500	Written, Oral, Visual, and Electronic Composition ㉒	3				
				17				**18**
IV	EE	4910	Senior Design Project I and Professionalism㉘	3	EE	4920	Senior Design Project II㉜	2
	EE	4940	Portfolio Assessment	R			3000-Level Math Course㉝	4
	EE	3220	Probabilistic Methods for Electrical Engineers	3			3000-Level Math Course㉞	4
	EE	4650	Digital VLSI Design㉙	3	EE	3030	Energy Systems and Power Electronics㉟	4
	EE	4560	Power System Analysis I㉚	3			EE Elective㊱	3-4
	EE	3210	Communication Systems I ㉛	3				
				15				**17**

Course sequences to be taken in years 3 and 4 at ISU are tentative and may change, if required. Academic advisors at ISU will work with students to set exact schedules upon entry to ISU.

Note: Units/Credit points earned for the course(s) in BITS Pilani and ISU shall be considered towards degrees to be awarded by both institutions in accordance with the following:

1. To complete the BITS Pilani Degree, students need to complete a minimum total of 144 units with a minimum number of 46 courses (30 courses with 85 units (min.) offered by BITS in first two years + 16 courses with 59 equivalent units offered by ISU). The Equivalent Unit is considered by assuming that a course of 1 units offered at BITS Pilani is equivalent to a 1 credit points course offered by ISU.

2. To complete the ISU Degree, students need to complete 128 credit points in total (3 waved courses with 12 units + 19 mapped courses with 62 equivalent credit points offered by BITS in the first two years + 25 courses with 66 credit points offered by ISU).

3. Upon completion of all BITS Pilani Courses during Years 1 and 2 (including summer term, if any) at the BITS Campus, students will receive 12+62 = 74 credit points as an ISU credit exemption against the 3 waived + 19 mapped Courses to complete the ISU Degree in accordance with ISU's policies and procedures.

4. Upon completion of all ISU Courses, students will receive 59 units of transfer credit for the 16 mapped courses to complete the BITS Pilani Degree in accordance with BITS' policies and procedures.

5. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani and ISU.

6. The details of an encircled number given against the selected courses in the semester-wise pattern are given below:

Symbol	Description
①	BIO F111: General Biology and BIO F110: Biology Laboratory is the compulsory foundation courses at BITS. These two courses will be considered as an equivalent to BIOL 1010: Introductory Biology to fulfil the general education elective requirement at ISU. Thus, it will fulfill the requirement of 1st course under General Education Requirement Elective out of the total 6 courses required under this category at ISU.
②	MATH F111: Mathematics I is the compulsory foundation course at BITS. It will be be considered as an equivalent to MATH 2650: Calculus III to fulfil the ISU requirement. MATH 2650 is considered to fill credit deficiency in ISU Basic Program.
③	PHY F110: Physics Laboratory is the compulsory foundation course at BITS. It will be considered as an equivalent to PHYS2310L: Introduction to Classical Physics I Laboratory to fulfil the ISU requirement.
④	PHY F111: Mechanics, Oscillations and Waves is the compulsory foundation course at BITS. It will be considered as an equivalent to PHYS 2310: Introduction to Classical Physics I to fulfil the ISU requirement.
⑤	BITS F110: Engineering Graphics is the compulsory foundation course at BITS. It will be considered as an equivalent to ME 1700: Engineering Graphics and Introductory Design to fulfil the ISU requirement.

Symbol	Description
⑥	Course MATH F112: Mathematics II is the compulsory foundation course at BITS. It will be considered as an equivalent to MATH 2070: Matrices and Linear Algebra to fulfil the ISU requirement.
⑦	Course MATH F113: Probability and Statistics is the compulsory foundation course at BITS. It will be considered as an equivalent to STAT 3050: Engineering Statistics to fulfil the ISU requirement. MATH 2650 is considered to fill credit deficiency in ISU Basic Program.
⑧	Course EEE F111: Electrical Sciences is the compulsory foundation course at BITS. It will be considered as an equivalent to EE 2010: Electric Circuit to fulfil the ISU requirement.
⑨	Course BITS F111: Thermodynamics is the compulsory foundation course at BITS. It will be considered as an equivalent to ME 2310: Engineering Thermodynamics I offered at ISU.
⑩	Course MATH F211: Mathematics III is the compulsory foundation course at BITS. It will be considered as an equivalent to MATH 2670: Elementary Differential Equations and Laplace Transforms, a foundation course offered at ISU. Mathematics I, II and III offered at BITS may fulfill mathematics requirements of ISU.
⑪	Course EEE F212: Electromagnetic Theory is the required core course at BITS. It will be considered as an equivalent to EE 3110: Electromagnetic Fields and Waves a required course offered at ISU.
⑫	Course EEE F215: Digital Design is the required core course at BITS. It will be considered as an equivalent to CprE 2810: Digital Logic a required course offered at ISU.
⑬	Course EEE F214: Electronic Devices is the required core course at BITS. It will be considered as an equivalent to EE 3320: Semiconductor Materials and Devices a required course offered at ISU.
⑭	Course ECON F211: Principles of Economics is the compulsory foundation course at BITS. It will be considered as an equivalent to ECON 1010: Principles of Microeconomics a ECON elective course offered at ISU.
⑮	Course EEE F242: Control Systems is the required core course at BITS. It will be considered as an equivalent to EE 4750: Automatic Control System an EE Elective course offered at ISU.
⑯	Course EEE F243: Signals and Systems is the required core course at BITS. It will be considered as an equivalent to EE 2240: Signals and Systems I is a required course offered at ISU.
⑰	The course BITS F225: Environmental Studies is a required course under general awareness courses at BITS Pilani. This course will be considered as equivalent to ENVS 3340: Environmental Ethics course offered at ISU under General Education Requirement Elective Category.
⑱	This would be the 1st Humanities Elective (HUEL) out of total required 3 HUELs at BITS. Students should select this course from the pool of Humanities electives (defined for BITS-ISU students) offered at BITS in such a way that the selected course will also fulfill the requirement of a course at ISU offered under General Education Requirement Elective Category.
⑲	This would be the 2nd Humanities Elective (HUEL) out of total required 3 HUELs at BITS. Students should select this course from the pool of Humanities electives (defined for BITS-ISU students) offered at BITS in such a way that the selected course will also fulfill the requirement of a course at ISU offered under General Education Requirement Elective Category.
⑳	Course EE 2300: Electronic Circuits and Systems is the required course offered at ISU. Also, this course will be treated as 1st Discipline Elective course required at BITS Pilani.
㉑	Course EE 2850: Problem Solving Methods and Tools for Electrical Engineering is the required course offered at ISU. Also, this course will be treated as 2nd Discipline Elective course required at BITS Pilani.

Symbol	Description
㉒	The course ENGL 2500: Written, Oral, Visual, and Electronic Composition is the required course offered at ISU. Also, this course will be considered as equivalent to 3rd course under Humanities Elective out of the total 3 courses required at BITS.
㉓	Course CprE 2880: Embedded Systems I is the required course offered at ISU. Also, this course will be treated as 3rd Discipline Elective course required at BITS Pilani.
㉔	Course EE 2320: Professional and Ethical Issues in Electrical and Computer Engineering is the core course offered at ISU. Also, this course will be 1st Open Elective (OPEL) out of total required 5 at BITS.
㉕	Course PHYS 2320: Introduction to Classical Physics II is the core course offered at ISU. Also, this course will be 2nd Open Elective (OPEL) out of total required 5 at BITS.
㉖	Course ENGL 3140: Technical Communication is the core course offered at ISU. Also, this course will be 3rd Open Elective (OPEL) out of total required 5 at BITS.
㉗	Course EE 3300: Integrated Electronics is the required course offered at ISU. Also, this course will be treated as 4th Discipline Elective course required at BITS Pilani.
㉘	Course BITS F456: Capstone Project I is the required course offered at BITS Pilani. Also, this course can be considered as equivalent to the course EE 4910: Senior Design Project I and Professionalism. This is the 1st Capstone Project out of 2 required at BITS.
㉙	Course EE 4650: Digital VLSI Design is the EE sequence course offered at ISU. Also, this course can be considered as equivalent to a required core EEE F313: Analog & Digital VLSI Design offered at BITS Pilani.
㉚	Course EE 4560: Power System Analysis I is the required course offered at ISU. Also, this course can be considered as equivalent to a required core EEE F312: Power Systems offered at BITS Pilani.
㉛	The course EE 3210: Communication Systems I required to be offered by ISU to fulfill the requirements of BITS. This course will be considered as equivalent to a required core course EEE F311: Communication Systems offered at BITS Pilani.
㉜	Course BITS F457: Capstone Project II is the required course offered at BITS Pilani. Also, this course can be considered as equivalent to the course EE 4920: Senior Design Project II. This is the 2nd Capstone Project out of 2 required at BITS.
㉝	This course would be a course under the requirement of 3000-Level Math course required at ISU. BITS-ISU students should select this course from the pool of 3000-Level Math courses offered at ISU. Also, this will be treated as 4th Open Elective (OPEL) out of total required 5 at BITS.
㉞	This course would be a course under the requirement of 3000-Level Math course required at ISU. BITS-ISU students should select this course from the pool of 3000-Level Math courses offered at ISU. Also, this will be treated as 5th Open Elective (OPEL) out of total required 5 at BITS.
㉟	The course EE 3030: Energy Systems and Power Electronics required to be offered by ISU as an EE Elective at ISU. Also, this course will be considered as equivalent to a required core course EEE F342: Power Electronics offered at BITS Pilani.
㊱	EE Elective (Students will take EE 4570: Power Systems Analysis – II as another EE elective to fufill EE Electives at ISU. It will also facilitates to cover the remaining course content of EEE F342: Power Electronics of BITS which is partially mapped with EE 3030: Energy Systems and Power Electronics.

Semester-wise Pattern for Students Admitted to B.E. Mechanical at BITS Pilani and B.S. Mechanical Engineering at ISU								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F111	General Biology①	3	BIO	F110	Biology Laboratory	1
	CHEM	F110	Chemistry Laboratory	1	MATH	F112	Mathematics II ⑥	3
	CHEM	F111	General Chemistry	3	ME	F112	Workshop Practice	2
	MATH	F111	Mathematics I②	3	MATH	F113	Probability and Statistics⑦	3
	PHY	F110	Physics Laboratory③	1	EEE	F111	Electrical Sciences⑧	3
	PHY	F111	Mechanics, Oscillations and Waves④	3	BITS	F111	Thermodynamics⑨	3
	BITS	F110	Engineering Graphics⑤	2	CS	F111	Computer Programming⑩	4
	BITS	112	Technical Report Writing	2				
				18				**19**
Year	**Summer Term**							**U**
			Humanities Elective⑪					3
			Humanities Elective⑫					3
			Humanities Elective⑬					3
								9
Year	**First Semester**			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III ⑭	3	ECON Or MGTS	F211 Or F211	Principles of Economics⑲ Or Principles of Management	3
	ME	F211	Mechanics of Solids ⑮	3	ME	F218	Advanced Mechanics of Solids⑳	2
	ME	F212	Fluid Mechanics	3	ME	F221	Mechanisms and Machines㉑	3
	ME	F216	Materials Science & Engineering⑯	3	ME	F315	Advanced Manufacturing Processes	3
	ME	F217	Applied Thermodynamics⑰	4	ME	F316	Manufacturing Management	2
	ME	F219	Manufacturing Processes⑱	4	ME	F317	Engines, Motors, and Mobility	2
					ME	F341	Prime Movers & Fluid Machines	3
					BITS	F225	Environmental Studies㉒	3
				20				**21**
Year	**First Semester**			**U**	**Second Semester**			**U**
III	CE	2740	Engineering Statics ㉓	3	EE	4420	Introduction to Circuits and Instruments	2
	ME	2700	Introduction to Mechanical Engineering Design ㉔	3	ME	3450	Engineering Dynamics ㉖	3
	LIB	1600	Introduction to College Level Research	1	ME	3240L	Manufacturing Engineering Laboratory	1
	ME	2020	Mechanical Engineering - Professional Planning	R	EE	4480	Introduction to AC Circuits and Motors ㉗	2
	ENGR	1010	Engineering Orientation	R	ME	3250	Mechanical Component Design㉘	3
	PHYS	2320/ L	Introduction to Classical Physics II **+ Laboratory** ㉕	5	ENGL	3140	Technical Communication㉙	3
	ENGL	2500	Written, Oral, Visual, and Electronic Composition	3			3000-Level Math Course ㉚	4
	UST	1100	International First-Year Experience Seminar	1				
				16				**18**
IV	AERE	4940	Make to Innovate II ㉛	3	ME	4150	Mechanical Systems Design㊱	3
	ME	4210	System Dynamics and Control ㉜	4	ME	4360	Heat Transfer ㊲	4
	ME	4250	Optimization Methods for Complex Designs ㉝	3	ME	4190	Computer-Aided Design㊳	3
	ME	3700	Engineering Measurements ㉞	3			3000-Level Math Course ㊴	4
	ME	3350	Fluid Flow ㉟	4				
				18				**14**

Course sequences to be taken in years 3 and 4 at ISU are tentative and may change slightly. Academic advisors at ISU will work with students to set exact schedules upon entry to ISU.

Note: Units/Credit points earned for the course(s) in BITS Pilani and ISU shall be considered towards degrees to be awarded by both institutions in accordance with the following:

1. To complete the BITS Pilani Degree, students need to complete a minimum total of 144 units with a minimum number of 49 courses (Thirty-two courses with 87 units (min.) offered by BITS in first two years + Seventeen courses with 57 equivalent units offered by ISU). The Equivalent Unit is considered by assuming that a course of 1 units offered at BITS Pilani is equivalent to a 1 credit points course offered by ISU.
2. To complete the ISU Degree, students need to complete 129 credit points in total (3 waved courses with 12 units + 22 mapped courses with 68 equivalent credit points offered by BITS in the first two years + 24 courses with 65 credit points offered by ISU).
3. Upon completion of all BITS Pilani Courses during Years 1 and 2 (including summer term, if any) at the BITS Campus, students will receive 12+68 = 80 credit points as an ISU credit exemption against the 3 waived + 22 mapped Courses to complete the ISU Degree in accordance with ISU's policies and procedures.
4. Upon completion of all ISU Courses, students will receive 57 units of transfer credit for the Seventeen mapped courses to complete the BITS Pilani Degree in accordance with BITS' policies and procedures.
5. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani and ISU.
6. The details of an encircled number given against the selected courses in the semester-wise pattern are given below:

Symbol	Description
①	BIO F111: General Biology and BIO F110: Biology Laboratory is the compulsory foundation courses at BITS. These two courses will be considered as an equivalent to BIOL 1010: Introductory Biology to fulfil the general education elective requirement at ISU. Thus, it will fulfill the requirement of 1st course under General Education Requirement Elective out of the total 6 courses required under this category at ISU.
②	MATH F111: Mathematics I is the compulsory foundation course at BITS. It will be considered as an equivalent to MATH 2650: Calculus III to fulfil the ISU requirement. MATH 2650 is considered to fill credit deficiency in ISU Basic Program.
③	PHY F110: Physics Laboratory is the compulsory foundation course at BITS. It will be considered as an equivalent to PHYS2310L: Introduction to Classical Physics I Laboratory to fulfil the ISU requirement.
④	PHY F111: Mechanics, Oscillations and Waves is the compulsory foundation course at BITS. It will be considered as an equivalent to PHYS 2310: Introduction to Classical Physics I to fulfil the ISU requirement.
⑤	BITS F110: Engineering Graphics is the compulsory foundation course at BITS. It will be considered as an equivalent to ME 1700: Engineering Graphics and Introductory Design to fulfil the ISU requirement.
⑥	Course MATH F112: Mathematics II is the compulsory foundation course at BITS. It will be considered as an equivalent to MATH 2070: Matrices and Linear Algebra to fulfil the ISU requirement.
⑦	Course MATH F113: Probability and Statistics is the compulsory foundation course at BITS. It will be considered as an equivalent to STAT 3050: Engineering Statistics to fulfil the ISU requirement. MATH 2650 is considered to fill credit deficiency in ISU Basic Program.
⑧	Course EEE F111: Electrical Sciences is the compulsory foundation course at BITS. It will be considered as an equivalent to EE 2010: Electric Circuit to fulfil the ISU requirement.
⑨	Course BITS F111: Thermodynamics is the compulsory foundation course at BITS. It will be considered as an equivalent to ME 2310: Engineering Thermodynamics I offered at ISU.

Symbol	Description
⑩	Course CS F111: Computer Programming is the compulsory foundation course at BITS. It will be considered as an equivalent to ME 1600: Mechanical Engineering Problem Solving with Computer Applications a foundation course offered at ISU.
⑪	This would be the 1st Humanities Elective (HUEL) out of total required 3 HUELs at BITS. Students should select this course from the pool of Humanities electives (defined for BITS-ISU students) offered at BITS in such a way that the selected course will also fulfill the requirement of a course at ISU offered under General Education Requirement Elective Category. Thus, it will fulfill the requirement of 2nd course under General Education Requirement Elective out of the total 5 courses required under this category at ISU.
⑫	This would be the 2nd Humanities Elective (HUEL) out of total required 3 HUELs at BITS. Students should select this course from the pool of Humanities electives (defined for BITS-ISU students) offered at BITS in such a way that the selected course will also fulfill the requirement of a course at ISU offered under General Education Requirement Elective Category. Thus, it will fulfill the requirement of 3rd course under General Education Requirement Elective out of the total 5 courses required under this category at ISU.
⑬	This would be the 3rd Humanities Elective (HUEL) out of total required 3 HUELs at BITS. Students should select this course from the pool of Humanities electives (defined for BITS-ISU students) offered at BITS in such a way that the selected course will also fulfill the requirement of a course at ISU offered under General Education Requirement Elective Category. Thus, it will fulfill the requirement of 4th course under General Education Requirement Elective out of the total 5 courses required under this category at ISU.
⑭	Course MATH F211: Mathematics III is the compulsory foundation course at BITS. It will be considered as an equivalent to MATH 2670: Elementary Differential Equations and Laplace Transforms, a foundation course offered at ISU. Mathematics I, II and III offered at BITS may fulfill mathematics requirements of ISU.
⑮	Course ME F211: Mechanics of Solids is the required core course at BITS. It will be considered as an equivalent to EM 3240 Mechanics of Materials a required course offered at ISU.
⑯	Course ME F216: Materials Science & Engineering is the required core course at BITS. It will be considered as an equivalent to MATE 2730 Principles of Materials Science and Engineering a required course offered at ISU.
⑰	Course ME F217: Applied Thermodynamics is the required core course at BITS. It will be considered as an equivalent to ME 3320 Engineering Thermodynamics II a required course offered at ISU.
⑱	Course ME F219: Manufacturing Processes is the required core course at BITS. It will be considered as an equivalent to ME 3240 Manufacturing Engineering a required course offered at ISU.
⑲	The course ECON F211: Principles of Economics is a required course at BITS Pilani. This course will be considered as equivalent to ECON 1010: Principles of Microeconomics course offered at ISU under General Education Requirement Elective Category. Thus, it will fulfill the requirement of 5th course under General Education Requirement Elective out of the total 5 courses required under this category at ISU.
⑳	Course ME F218: Advanced Mechanics of Solids is the required core course at BITS. It will be considered as an equivalent to EM 4240: Intermediate Mechanics of Materials a required course offered at ISU.
㉑	Course ME F221: Mechanisms and Machines is the required core course at BITS. It will be considered as an equivalent to ME 4160: Mechanism Design and Analysis a required course offered at ISU.

Symbol	Description
㉒	The course BITS F225: Environmental Studies is a required course under general awareness courses at BITS Pilani. This course will be considered as equivalent to ENVS 3340: Environmental Ethics course offered at ISU under General Education Requirement Elective Category. Thus, it will fulfill the requirement of 5th course under General Education Requirement Elective out of the total 5 courses required under this category at ISU.
㉓	Course CE 2740: Engineering Statics is the core course offered at ISU. Also, this course will be treated as 1st Open Elective (OPEL) out of total required 5 at BITS.
㉔	Course ME 2700: Introduction to Mechanical Engineering Design is the core course offered at ISU. Also, this course will be treated as 1st Discipline Elective course required at BITS Pilani.
㉕	Course PHYS 2320: Introduction to Classical Physics II & course PHYS 2320L: Introduction to Classical Physics II Laboratory are the core courses offered at ISU. Also, these courses will be treated as 2nd Open Elective (OPEL) out of total required 5 at BITS.
㉖	Course ME 3450: Engineering Dynamics is the core course offered at ISU. Also, this course will be treated as 2nd Discipline Elective course required at BITS Pilani.
㉗	Course EE 4480: Introduction to AC Circuits and Motors is a core course offered at ISU. Also, this course will be treated as 3rd Open Elective (OPEL) out of total required 5 at BITS.
㉘	Course ME 3250: Mechanical Component Design is the core course offered at ISU. Also, this course will be considered as equivalent to ME F314: Design of Machine Elements at BITS a, required core course offered at BITS Pilani.
㉙	Course ENGL 3140: Technical Communication would be a course under the requirement of Communication requirement at ISU. Also, will be treated as 4th Open Elective (OPEL) out of total required 5 at BITS.
㉚	This course would be a course under the requirement of 3000-Level Math course required at ISU. BITS-ISU students should select this course from the pool of 3000-Level Math courses offered at ISU. Also, will be treated as 5th Open Elective (OPEL) out of total required 5 at BITS.
㉛	Course AERE 4940: Make to Innovate II is a project-based technical elective course for mechanical engineering students offered at ISU. This will be considered as equivalent to BITS F456: Capstone Project I, which is the required course offered at BITS Pilani. This is the 1st Capstone Project out of 2 required at BITS.
㉜	Course ME 4210: System Dynamics and Control is the core course offered at ISU. Also, this course will be considered as equivalent to ME F319: Vibrations and Control a, required core course offered at BITS Pilani.
㉝	The course ME 4250: Optimization Methods for Complex Designs is a required course at ISU. Also, this course will be considered as equivalent to ME F320: Engineering Optimization, a required core course offered at BITS Pilani.
㉞	Course ME 3700: Engineering Measurements is the core course offered at ISU. Also, this course will be treated as 3rd Discipline Elective course required at BITS Pilani.
㉟	Course ME 3350: Fluid Flow is the core course offered at ISU. Also, this course will be treated as 4th Discipline Elective course required at BITS Pilani.
㊱	Course BITS F457: Capstone Project II is the required course offered at BITS Pilani. Also, this course will be considered as equivalent to the course ME 4150: Mechanical Systems Design offered as Capstone Design at ISU. This is the 2nd Capstone Project out of 2 required at BITS.
㊲	Course ME 4360: Heat Transfer is the core course offered at ISU. Also, this course will be considered as equivalent to ME F220: Heat Transfer a required core course offered at BITS Pilani.
㊳	The course ME 4190: Computer-Aided Design required to be offered by ISU as a Technical Elective at ISU. Also, this course will be considered as equivalent to a required core course ME F318: Computer-Aided Design offered at BITS Pilani.
㊴	This course would be a course under the requirement of 3000-Level Math course required at ISU. BITS-ISU students should select this course from the pool of 3000-Level Math courses offered at ISU. Also, will be treated as 6th Open Elective (OPEL) required at BITS.

C. BITS Pilani – University at Buffalo (UB)-Dual Degree Programmes

The partnership includes a deeper engagement with the partner institution and students, including:

- Co-branded programmes with partner Institutions, including joint marketing, delivery, and operational responsibilities.
- Students are recruited through the existing BITSAT admissions process.
- Students will spend two years at BITS campuses before transferring to UB in the USA.
- Students will have regular exposure to academics from partnering institutions in their respective locations.
- Students will receive dual degrees, one from each institution.
- Students complete their degree and obtain Post Study Work Authorization or Optimal Practical Training upto 24 months in the USA.
- Students will pay a substantially lower overall cost compared to the entirely US programmes.

Category wise structure of each program to fulfill Degree requirement of BITS Pilani for 2+2 International Collaborative First Degree Programmes offered under the BITS-UB collaborations

Category	Courses to be offered at BITS Pilani		Courses to be offered at UB (for BITS Requirement)		Total	
	Courses	Unit	Courses	Eq. Unit*	Courses	Unit
Humanities Elective	(0-3)	(0-9)	(0-3)	(0-9)	3	9
Science Foundation	6 (6)	12 (12)			6	12
Mathematics Foundation	4 (4)	12 (12)			4	12
Engineering Foundation	2 (2)	6 (6)			2	6
Technical Arts	(3-4)	(7-10)	(0-1)	(0-3)	4	10
General Awareness / Professional Courses	2 (2)	6 (6)			2	6
Sub-Total	**(17-21)**	**(43-55)**	**(0-4)**	**(0-12)**	**21**	**55**
Core	(7-11)	(26-37)	(3-8)	(14-24)	(10-16)	(33-48)
Discipline Elective	(0-4)	(0-15)	(0-4)	(0-15)	(4-9)	(12-27)
Sub-Total	**(7-15)**	**(26-52)**	**(3-12)**	**(14-39)**	**(14-20)**	**62**
Open Elective	(0-9)	(0-27)	(0-9)	(0-27)	(5-9)	(15-27)
Capstone Project			2	8	2	8
Grand Total	**(24-32)**	**(69-92)**	**(14-23)**	**(52-68)**	**(46-54)**	**144**

***Equivalent Unit:** Assuming a course of 3-4 units offered at BITS Pilani is equivalent to a 3-4 credit points course offered by UB. The Unit of each Capstone Project offered at UB is proposed to be considered equal to 4 units at BITS Pilani. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani.

Note:

1. Unlike other BITS students of regular 4-year First Degree Programmes, Students of the 2+2 International Collaborative First Degree Programmes need not to register for Practice School or Thesis. Such students will have to complete two Capstone Projects in place of Practice School II or First Degree Thesis to meet the requirements of their degree programmes.
2. Some of the courses which are offered at UB may have different credit points, the grades earned by the students at UB will be converted appropriately by making equivalency of the courses and by converting UB credit points into BITS units, and the CGPA shall be calculated accordingly based on their grades earned in all the respective courses.
3. Table given above describes the general curricular structure for the 2+2 International Collaborative First Degree Programmes offered under the BITS-UB collaborations and accordingly, the semesterwise pattern of each specific programme has designed.

The BITS-UB ("UBITS") 2+2 International Collaborative First Degree Programmes to be offered under this scheme are:

- B.E. Computer Science at BITS Pilani, India and B.S. Computer Engineering by University at Buffalo, USA
- B.E. Mechanical at BITS Pilani, India and B.S. Mechanical Engineering by University at Buffalo, USA
- B.E. Electrical & Electronics at BITS Pilani, India and B.S. Electrical Engineering by University at Buffalo, USA
- B.E. Electronics & Communication at BITS Pilani, India and B.S. Electrical Engineering by University at Buffalo, USA.

Input Qualification:

(a) BITS Pilani minimum eligibility requirement

Applicant should also fulfil the minimum eligibility requirement of BITS Pilani for admission as follows:

(i) The applicant has passed the 12th examination of 10+2 system from a recognized National/State/International board or its equivalent with Physics, Chemistry and Mathematics (PCM) and adequate proficiency in English; Also, the applicant has obtained a minimum of aggregate 75% marks in PCM in 12th examination, with at least 60% marks in each of the PCM subjects.

(ii) The applicant undertakes the BITS Admission Test (BITSAT) and achieves a score that meets or exceeds the relevant cut-off score for admission to the BITS Award, as determined by BITS from time to time.

(b) University at Buffalo minimum eligibility requirement

Applicants should also fulfil the minimum eligibility requirements of the University at Buffalo for admission as follows. The UB admission eligibility requirement is as follows.

(i) One of the following must be achieved:

Successful completion of one of the following secondary qualifications in India:

1. All India Senior School Certificate (AISSC) 10+2 with a minimum average of 65%*
2. Indian School Certificate (ISC) with a minimum average of 65%*
3. State Boards of Education Higher Secondary Certificate, (HSC) with a minimum average of 70%*

*Overall average for graded academic subjects, excluding work experience, physical and health education, art, religious and general studies.

(ii) Successful completion of the AISSC; ISC; State Board HSC Mathematics/ HSC Mathematics with a minimum grade of 60%.

(iii) Where an applicant does not have an Indian secondary qualification, they must meet the UB criteria for their respective country of secondary education study as approved by UB and notified to BITS by UB (listed on the UB website under entry requirements by country, from time to time).

(iv) English Language Entry Requirements

Applicants must meet UB's English Language proficiency requirements as follows:

1. Applicants are required to provide evidence of English language proficiency for admission into the above UBITS 2+2 International Collaborative Programmes in accordance with the requirements published on UB's website from time to time.
2. Where an English language proficiency test is used for admission, the test must be taken no more than 2 years prior to the applicant's Commencing Date for the UBITS 2+2 International Collaborative Programmes.
3. Applicants who have not completed one of the English proficiency tests listed above or as published on the UB website from time to time can be deemed to have met the English language entry requirements if they can provide evidence of one of the following:

English Proficiency Test Type & Minimum Scores

Below are the minimum scores to be eligible for consideration for admission to UB's undergraduate programmes.

TEST	MINIMUM SCORES*
TOEFL (IBT) (including MyBest scores) TOEFL Home Edition	70
TOEFL Essentials	8.5
TOEFL (PBT) and TOEFL ITP Plus	523
IELTS and IELTS Indicator	6.0
PTE Academic or PTE Academic Online	50
ACT (English AND reading sections)	18
SAT I ERWS	500
CAEL	70
CanTEST	4.5
Cambridge English Proficiency (CPE)	185
Cambridge English Advanced (CAE)	185
IB Higher Level English A Literature	4
IB Higher Level English A Language and Literature	4
AS Level or A Level English or English Language Subject	C
Duolingo English Test (DET)	105

More information is available at https://www.buffalo.edu/internationaladmissions/get-ready-to-apply/apply/freshman-admissions-criteria.host.html/content/shared/www/internationaladmissions/admissionscriteriatabs/english.detail.html

Note: UBITS students are required to achieve the following sub-section scores on the TOEFL, IELTS or Duolingo tests to be placed in the ELI 105 course offered remotely by UB in the first semester of the UBITS Collaborative Programmes. Students whose sub-section scores are lower than the sub-section minimums below will be placed in ELI 100, and will take ELI 105 remotely in summer 2025.

Sub-Section Skill	iBT TOEFL Minimum Sub-Section Score	IELTS Minimum Sub-Section Score
Reading	21	6.5
Listening	21	6.5

Speaking	23	6.5
Writing	24	6.5

Duolingo English Test (DET) (Sub-Section Skills)	Duolingo English Test (DET) (Minimum Sub-Section Score)
Comprehension	125
Conversation	130
Literacy	140
Production	145

In addition, during their second year after being admitted to UB, students in the UBITS programme must successfully apply for an **F-1 student visa** needed to enter the United States as a student. Once admitted to UB and having provided evidence of financial sufficiency, UBITS students will receive an I-20 visa document to apply for an F-1 student visa. Complete information about applying for an F-1 visa may be found here.

Mode of Admission:
Admissions will be made purely on merit. The merit position of the candidate will be based on the score obtained by the candidate in a Computer based Online Test (BITSAT) conducted by BITS, Pilani. The candidates should also fulfil the essential requirement of a minimum of aggregate **75% marks** in Physics, Chemistry and Mathematics subjects in the 12th examination with at least 60% marks in each of the Physics, Chemistry, and Mathematics subjects.

Upon completion of the BITSAT successfully, students will make their Programme selections which will include the BITS-UB programmes. Details of applicants who meet BITS admission criteria will be forwarded to University at Buffalo for assessment against their eligibility criteria such as proof of year 12 marks and proof of English language proficiency to the UB standard.

Admission into the Academy for UAE (Dubai) based offerings will include details of applicants who meet BITS admission criteria being forwarded to UB for assessment against UB eligibility criteria such as proof of year 12 marks and proof of English language proficiency to the UB standard. Students that UB deems to have met their criteria will be confirmed with BITS Pilani. Successful applicants will be provided admission offers.

According to the UGC Regulations mentioned above, dual-degree programmes will be those which are offered by both the Indian and foreign university in the same subject area and at the same qualification level. Degrees will be awarded separately and simultaneously from both universities. Prospective students must meet the admission requirements of both the Indian and Foreign universities and shall apply to and be admitted separately to both universities.

Duration:
The normal duration of the programme will be 8 semesters (Four Semesters and a summer term at any of the Campuses of BITS Pilani and another four Semesters at University at Buffalo, USA).

Internship opportunities

- Engineering programmes at the University at Buffalo include a required capstone design experience that spans the senior year (fall and spring semesters). Students work in teams to tackle a real-world engineering design problem. It is common for students to work with industry partners on senior design projects. The experiences leverage the technical and professional skills (e.g., teamwork, communication, creativity, critical thinking, problem solving, leadership) students acquire over the span of the four-year programme. At the end of the spring semester, project teams present their work in various forums. Below are programme-specific details.

- UB, New York State's flagship university and member of the Association of American Universities (AAU), is a world-class university with a worldwide impact. With an enrollment of more than 30,000, including more than 5,000 international students, UB is consistently recognized as one of the world's most exceptional universities, making it a top choice for students and faculty around the globe.

- UB's School of Engineering and Applied Sciences (SEAS), founded in 1946, provides an inclusive environment that supports big thinking, creative freedom, and vast possibilities for achievement. The program of study includes extensive hands-on experiences in the curriculum and is complemented by both research and employment opportunities during the academic semesters and summer.
- Students in SEAS have access to world-class facilities and laboratories, including an electrical engineering clean room, a digital manufacturing lab, a machine shop with CNC equipment and 3D printers, a motion-base driving simulator, a 24,000-square-foot outdoor UAV research structure, a leading academic supercomputing facility, and so much more.

- In addition to UB's vibrant international student clubs, SEAS offers over 45 science and engineering-related clubs and organizations where students can explore ideas, network with SEAS professors and industry professionals, and gain hands-on research experience.

- Engineering students take advantage of internships and cooperative education opportunities that provide paid and supervised work experience to complement formal academic classwork. The University office provides career advising and preparation support for internships, and post-graduation employment.
- International students on a study visa (F-1) can also pursue off-campus employment opportunities prior to the completion of an academic program or degree by availing of the Curricular Practical Training (CPT), for example for internships and co-ops during the summer

or academic semester. Students are eligible for upto 365 days of CPT while completing their bachelor's degree.

- Post-completion Optional Practical Training (OPT) is a 12-month period of work authorization (up to 24 months for engineering fields), or practical training. OPT is an opportunity for F-1 students to take what they learned in the classroom and apply their knowledge to a work setting. Generally, these work experiences are off-campus or for non-student positions at UB.

The four dual degree programmes in collaboration with University at Buffalo (UB) have launched in the Academic Year 2024-25 as part of partnership arrangement. The UB engineering programmes proposed for this partnership are fully accredited by ABET and require capstone projects. These are either industry sponsored or faculty led research projects. Students will apply their technical knowledge, research, design and professional engineering skills to either discipline specific, or cross disciplinary engineering problems, through robust research and established engineering design processes.

The collaborative 'dual degree' programmes at the international level are being offered in collaboration with University at Buffalo in the same specialization and at the same qualification level. In this 4-year collaborative 'dual degree' programme, students will spend the first two years alongwith a summer term (if required) at BITS Pilani campuses before getting transferred to University at Buffalo in USA for the remaining two years (i.e., years 3 and 4) of their study period. The courses mentioned in the semester-wise pattern in years 1 and 2 alongwith the summer term (if any) will be offered at BITS Pilani Campuses whereas those courses specified in years 3 and 4 will be offered at UB. The Equivalent Unit may be considered by assuming that a course of 1 units offered at BITS Pilani is equivalent to a 1 credit points course offered by UB. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani and UB. Accordingly, the UB credit points will be converted into BITS course units and vice versa by making appropriate equivalency of these courses.

Semester-wise Pattern for Students Admitted to B.E. Computer Science under BITS – UB								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory ①	1	BITS	F111	Thermodynamics	3
	CHEM	F111	General Chemistry ②	3	CS	F111	Computer Programming ⑧	4
	MATH	F111	Mathematics I ③	3	MATH	F113	Probability and Statistics ⑨	3
	PHY	F110	Physics Laboratory ④	1	EEE	F111	Electrical Sciences ⑩	3
	PHY	F111	Mechanics, Oscillations and Waves ⑤	3	PHY	108	Physics ⑪	4
	BITS	F110	Engineering Graphics ⑥	2				
	ELI	100 or 105	Intro to Academic Writing (offered by UB to fulfill UBC CL1 requirement ⑦	3 Or 4				
				20				**22**
Summer Term								
ELI 105: Writing and Rhetoric only if students were placed into ELI 100 in first fall term (Students who do not meet placement requirements. These students would then take ELI 105 in the summer between Year 1 and Year 2, remotely online offered by UB). ⑫								4
Humanities Elective (The course is required to offered to fulfill Humanities Elective Requirement at BITS Only ⑫-A								3
Year	**First Semester**			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III ⑬	3	ECON Or MGTS	F211 Or F211	Principles of Economics Or Principles of Management	3
	CS	F214	Logic in Computer Science	3	CS	F211	Data Structures & Algorithms ⑱	4
	CS	F222	Discrete Structure for Computer Science ⑭	3	CS	F212	Database Systems	4
	CS	F213	Object Oriented Programming ⑮	4	CS	F351	Theory of Computations	3
	CS	F215	Digital Design ⑯	4	BITS	F225	Environmental Studies ⑲ **<PW1>**	3
	EAS	360	STEM Communications ⑰	3	DIV		Thematic Pathway List 1 Course to satisfy Diversity requirement ⑳ **<PW2>**	3
				20				**20**
Year	**First Semester**			**U**	**Second Semester**			**U**
III	EE	310	Electronic Devices and Circuits I ㉑	3	CSE	305	Introduction to Programming Languages ㉖	4
	CSE	220	Systems Programming㉒	4	CSE	341	Computer Organization ㉗	4
	MTH	309	Linear Algebra ㉔	4	CSE	379	Microprocessors ㉘	4
	EE	312	Basic Electronic Instrumentation Lab ㉕	2	CSE	431	Algorithms Analysis and Design ㉙	3
	EAS	198	UB Seminar ㉕	1				
	PHY	158	General Physics II Lab	1				
				15				**15**
IV	CSE	450	Hardware/Software Integrated Systems Design I ㉛	3	CSE	453	Hardware/Software Integrated Systems Design 2 ㉜	3
	CSE	321	Real -Time and Embedded Operating Systems ㉝	4	CSE	489	Modern Networking Concepts ㊱	3
	CSE	460	Data Models and Query Languages ㉞	3	CSE	490	Computer Architecture ㊲	3
	PW		Pathway Course ㉟**<PW3>**	3	PW		Pathway Course ㊳ **<PW4>**	3
	CSE	421	Introduction to Operating Systems ㉓	3	CSE	443	Compilers ㉚	4
					UBC	399	UB Curriculum Capstone	1
				16				**17**

Note: Units/Credit points earned for the course(s) in BITS Pilani and UB shall be considered towards degrees to be awarded by both institutions in accordance with the following:

1. To complete the BITS Pilani Degree, students need to complete a minimum total of 146 units with a minimum number of 47 courses (four courses with 13 units offered jointly by UB (online) and BITS + twenty-five courses with 72 units (min.) offered by BITS in first two years + eighteen courses with 61 equivalent units offered by UB). The Equivalent Unit is considered by assuming that a course of 1 units offered at BITS Pilani is equivalent to a 1 credit points course offered by UB.
2. To complete the UB Degree, students need to complete 124 credit points in total (4 courses with 14 credit points offered jointly by UB (online) and BITS + 15 mapped courses with 47 equivalent credit points offered by BITS in the first two years + 21 courses with 63 credit points offered by UB).
3. Upon completion of all BITS Pilani Courses during Years 1 and 2 (including summer term, if any) at the BITS Campus, students will receive 47 credit points as an UB credit exemption against the 15 mapped courses to complete the UB Degree in accordance with UB's policies and procedures.
4. Upon completion of all UB Courses, students will receive 74 (=13+61) units of transfer credit for the 22 (=4+18) mapped courses to complete the BITS Pilani Degree in accordance with BITS' policies and procedures.
5. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani and UB.
6. The details of an encircled number given against the selected courses in the semester-wise pattern are given below:

Symbol	Description
①	Course CHEM F110: Chemistry Laboratory is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to CHE 113LAB: General Chemistry for Engineers Laboratory 1a required course offered at UB.
②	Course CHEM F111: General Chemistry is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to CHE 999: Chemistry 1 a required course offered at UB.
③	Course MATH F111: Mathematics I is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to MTH 241: Calculus 3 a required course offered at UB. (Note: Though the Courses MTH 141: Calculus 1 & MTH 142: Calculus 2 are the foundation courses offered at UB, their course contents are overlapping with the NCERT syllabus, which are studied by the students at their Higher secondary level. Therefore, MTH 141: Calculus 1 & MTH 142: Calculus 2 requirements at UB shall be waived).
④	Course PHY F110: Physics Laboratory is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to PHY 151LAB - Physics Lab 1 a required course offered at UB.
⑤	Course PHY F111: Mechanics, Oscillations and Waves is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to PHY 107LR: General Physics 1 a required course offered at UB.
⑥	Course BITS F110: Engineering Graphics is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to EAS 999TR177/MAE 177: Engineering Drawing and CAD a required course offered at UB.
⑦	Course ENG 105: Writing and Rhetoric is the required course offered at UB. It would be offered by UB to fulfill UB requirement through online mode. It may be considered as Open Elective for BITS requirement by mapping with courses such as GS F223 Introduction to Mass Communication or GS F325 Journalism or GS F326 Creative Thinking or GS F344 Copywriting. This course can be considered as the 1st Open Elective course out of 5 required at BITS.

⑧	Course CS F111: Computer Programming is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to CSE 115/EAS 230: Engineering Computations a required course offered at UB.
⑨	Course MATH F113: Probability and Statistics is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to STA 301: Introduction to Probability is a course available for Senior Students at UB.
⑩	Course EEE F111: Electrical Sciences is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to EE 202: Circuit Analysis a required course offered at UB.
⑪	Course PHY 108: Physics 2 is the required course offered at UB. It would be offered by UB to fulfill UB requirement through online mode. It may be considered as Open Elective for BITS Requirement.
⑫	ELI 105: Writing and Rhetoric is required only if students were placed into ELI 100 in first fall term (Students who do not meet placement requirements. These students would then take ELI 105 in the summer between Year 1 and Year 2, remotely online offered by UB).
⑫-A	The course is required to offered to fulfill Humanities Elective Requirement at BITS Only. This would be the 1st Humanities Elective (HUEL) out of total required 3 HUELs.
⑬	Course MATH F211: Mathematics III is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to MTH 306: Differential Equations a required course offered at UB.
⑭	Course CS F222: Discrete Structure for Computer Science is a required core course at BITS Pilani. It will be considered as equivalent to CSE 191: Introduction to Discrete Structures a required course offered at UB.
⑮	Course CS F213: Object Oriented Programming is a required core course at BITS Pilani. It will be considered as equivalent to CSE 116: Introduction to Computer Science II a required course offered at UB.
⑯	Course CS F215: Digital Design is a required core course offered at BITS Pilani. It will be considered as equivalent to CSE 241: Digital Systems a required course offered at UB.
⑰	Course EAS 360: STEM Communications is the required course offered at UB. It will be considered as an equivalent to BITS F112: Technical Report Writing a required foundation course at BITS Pilani.
⑱	Course CS F211: Data Structures & Algorithms is a required core course at BITS Pilani. It will be considered as an equivalent to CSE 250: Data Structures a required course offered at UB.
⑲	BITS F225: Environmental Studies is the required foundation course at BITS. It will be considered as equivalent to EVS 118: Intro Environment and Sustainability Studies offered at UB. Course EVS 118 Intro Environment and Sustainability Studies will also fulfill the requirement of a course at UB offered under Thematic or Global Pathway category. Thus it will fulfill the requirement of 1st course under Thematic or Global Pathway category out of the total required 4 courses required under this category. (It would be offered by UB to fulfill UB requirement of all students through online mode).
⑳	This would be the 2nd Humanities Elective (HUEL) out of total required 3 HUELs. Students should select this course from the pool of Humanities electives offered at BITS in such a way that the selected course will also fulfill the requirement of a course at UB offered under Thematic or Global Pathway category. Thus it will fulfill the requirement of 2nd course under Thematic or Global Pathway category out of the total required 4 courses required under this category.
㉑	Course EE 310: Electronic Devices & Circuits 1 is the required course offered at UB. Also, this course will be considered as the 3rd Open Elective for BITS Requirement.
㉒	Course CSE 220: Systems Programming is the required course offered at UB. Also, this will be considered as the 1st Discipline Elective course out of 4 required at BITS.
㉓	The course CSE 421: Introduction to Operating Systems required to be offered by UB to fulfill the requirements of BITS Pilani. BITS-UB Students shall take the course and this will be considered as equivalent to a required core course CS F372: Operating Systems offered at BITS Pilani in 3rd Year.
㉔	Course MTH 309: Introductory Linear Algebra is the required course offered at UB. Also, this course will be considered as the 4th Open Elective for BITS requirement.

㉕	Course EE 312: Basic Electronic Instrumentation Lab is a required course offered at UB. If students will complete EE 312 and EAS 198, BITS will consider it equivalent to CS F366: Lab Project and this course will be considered as the 5th Open Elective for BITS Requirement.
㉖	The course CSE 305LR: Introduction to Programming Languages required to be offered by UB to fulfill the requirements of BITS Pilani. BITS-UB Students shall take the course and this will be considered as equivalent to a required core course CS F301: Principles of Programming Language offered at BITS Pilani in 3rd Year.
㉗	Course CSE 341: Computer Organization is the required course offered at UB. Also, this will be considered as the 2nd Discipline Elective course out of 4 required at BITS.
㉘	CSE 379: Introduction to Microprocessor is the required course at UB. This course will be equivalent to CS F241: Microprocessors and Interfacing, a required core course offered at BITS.
㉙	The course CSE 431: Algorithms Analysis and Design required to be offered by UB to fulfill the requirements of BITS Pilani. BITS-UB Students shall take the course and this will be considered as equivalent to a required core course CS F364: Design & Analysis of Algorithms offered at BITS Pilani in 3rd Year.
㉚	The course CSE 443: Compilers required to be offered by UB to fulfill the requirements of BITS Pilani. BITS-UB Students shall take the course and this will be considered as equivalent to a required core course CS F363: Compiler Construction offered at BITS Pilani in 3rd Year.
㉛	Course CSE 450: Hardware/Software Integrated Systems Design I is a course offered at UB. Also, this course will be considered as equivalent to the course BITS F456: Capstone Project I a required course offered at BITS Pilani. This is the 1st Capstone Project out of 2 required at BITS. All BITS-UB students have to do two Capstone Projects in place of Practice School II/Thesis.
㉜	Course CSE 453: Hardware/Software Integrated Systems Design 2 is a course offered at UB. Also, this course will be considered as equivalent to the course BITS F457: Capstone Project II a required course offered at BITS Pilani. This is the 2nd Capstone Project out of 2 required at BITS. All BITS-UB students have to do two Capstone Projects in place of Practice School II/Thesis.
㉝	Course CSE 321: Real -Time and Embedded Operating is a required course offered at UB. Also, this course will be considered as the 3rd Discipline Elective out of 4 required at BITS.
㉞	Course CSE 460: Data Model and Query Languages is the CSE 400-Level Elective course offered at UB. Also, this will be considered as the 4th Discipline Elective course out of 4 required at BITS.
㉟	This would be the 3rd Humanities Elective (HUEL) out of total required 3 HUELs. Students should select this course in such a way that the selected course will not only fulfill the requirement of a course at UB offered under Thematic or Global Pathway category but also fulfill Humanities electives requirement of BITS Pilani. Thus it will fulfill the requirement of 3rd course under Thematic or Global Pathway category out of the total required 4 courses required under this category.
㊱	The course CSE 489: Modern Networking Concepts required to be offered at UB. BITS-UB Students shall take the course as CSE 400-Level Technical Elective required at UB and this course will be considered as equivalent to a required core course CS F303: Computer Networks offered at BITS Pilani in 3rd Year.
㊲	Course CSE 490: Computer Architecture is the required course offered at UB. Also, this course will be considered as equivalent to CS F342: Computer Architecture a required core course offered at BITS Pilani in 3rd Year.
㊳	This course will be considered as an additional Open Elective for BITS Requirement. Students should select this course in such a way that the selected course will not only fulfill the requirement of a course at UB offered under Thematic or Global Pathway category but also fulfill open elective requirement of BITS Pilani. Thus it will fulfill the requirement of 4th course under Thematic or Global Pathway category out of the total required 4 courses required under this category.

Semester-wise Pattern for Students Admitted to B.E. Electronics and Communication under BITS – UB								
Year	**First Semester**			**U**	**Second Semester**			**U**
	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory ①	1	BITS	F111	Thermodynamics	3
	CHEM	F111	General Chemistry ②	3	CS	F111	Computer Programming ⑧	4
	MATH	F111	Mathematics I ③	3	MATH	F113	Probability and Statistics ⑨	3
	PHY	F110	Physics Laboratory ④	1	EEE	F111	Electrical Sciences ⑩	3
	PHY	F111	Mechanics, Oscillations and Waves ⑤	3	PHY	108	Physics 2 ⑪	4
	BITS	F110	Engineering Graphics ⑥	2				
	ELI	100 or 105	Intro to Academic Writing (offered by UB to fulfill UBC CL1 requirement ⑦	3 Or 4				
				20				**22**
Summer Term								
ELI 105: Writing and Rhetoric ONLY if students were placed into ELI 100 in first fall term ⑫								4
1st Humanities Elective (The course is required to offered to fulfill Humanities Elective Requirement at BITS Only ⑫-A								3
II	MATH	F211	Mathematics III ⑬	3	ECON Or MGTS	F211 Or F211	Principles of Economics Or Principles of Management	3
	ECE	F211	Electrical Machines ⑭	4	ECE	F241	Microprocessors and Interfacing ⑱-A	4
	ECE	F314	EM Fields and Microwave Engineering ⑮	3	ECE	F242	Control Systems	3
	ECE	F215	Digital Design ⑯	4	ECE	F243	Signals & Systems ⑱	3
	EAS	360	STEM Communications ⑰	3	BITS	F225	Environmental Studies ⑲ **<PW1>**	3
	ECE	F312	EM Fields and Microwave Engineering Laboratory	1	DIV		Thematic Pathway List 1 Course to satisfy Diversity requirement **<PW2>** ⑳	3
			Open Elective	3				
				21				**19**
III	EE	310	Electronic Devs & Circs 1 ㉑	3	EE	311	Electronic Devs & Circs 2 ㉕	3
	EE	352	Intro Electronics Lab ㉒	3	EE	383	Communications Systems I ㉖	3
	EAS OR MTH	230 OR 309	Engineering Computations OR Intro Linear Algebra ㉓	3 4	EE	336	Fundamentals of Energy Systems ㉗	3
			Thematic or Global Pathway Course ㉔ **<PW3>**	3	EE	353	Electronic Circuits ㉘	3
	EAS	198	UB Seminar	1	PHY	207	General Physics 3 ㉙	4
	PHY	158	General Physics II Lab	1	PHY	257	Physics 3 Lab	1
				14				**17**
IV	EE EE	408 499	Senior Seminar Independent Study ㉚	1 3	EE	494	Senior Capstone Design Project ㉛	3
	EE	478	HDL Based Digital Design with Programmable Logic ㉜	3	EE	434	Principles of Networking ㊱	4
	EE	491	Analog Integrated Circuits ㉝	3	EE	439	Principle of Information Theory and Coding ㊲	3
			EE Electives ㉞	3	ECE	434	Digital Signal Processing ㊳	3
			Thematic or Global Pathway Course (Humanities Elective for BITS) ㉟ **<PW4>**	3	UBC	399	UB Curriculum Capstone	1
				13				**14**

Note: Units/Credit points earned for the course(s) in BITS Pilani and UB shall be considered towards degrees to be awarded by both institutions in accordance with the following:

1. To complete the BITS Pilani Degree, students need to complete a minimum total of 144 units with a minimum number of 49 courses (four courses with 12 units offered jointly by UB (online) & BITS + 25 courses with 68 units (min.) offered by BITS in first two years + 18 with 60 equivalent units offered by UB). The Equivalent Unit is considered by assuming that a course of 1 units offered at BITS Pilani is equivalent to a 1 credit points course offered by UB.
2. To complete the UB Degree, students need to complete 119 credit points in total (2 courses with 8 credit points waived + 4 courses with 14 credit points offered jointly by UB (online) & BITS + 15 mapped courses with 45 equivalent credit points offered by BITS in the first two years + 23 courses with 60 credit points offered by UB).
3. Upon completion of all BITS Pilani Courses during Years 1 and 2 (including summer term, if any) at the BITS Campus, students will receive 45 credit points as an UB credit exemption against the 15 mapped courses to complete the UB Degree in accordance with UB's policies and procedures.
4. Upon completion of all UB Courses, students will receive 72 (=12+60) units of transfer credit for the 22 (=4+18) mapped courses to complete the BITS Pilani Degree in accordance with BITS' policies and procedures.
5. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani and UB.
6. The details of an encircled number given against the selected courses in the semester-wise pattern are given below:

Symbol	Description
①	Course CHEM F110: Chemistry Laboratory is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to CHE 113LAB: General Chemistry for Engineers Laboratory 1a required course offered at UB.
②	Course CHEM F111: General Chemistry is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to CHE 999: Chemistry 1 a required course offered at UB.
③	Course MATH F111: Mathematics I is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to MTH 241: Calculus 3 a required course offered at UB. (Note: Though the Courses MTH 141: Calculus 1 & MTH 142: Calculus 2 are the foundation courses offered at UB, their course contents are overlapping with the NCERT syllabus, which are studied by the students at their Higher secondary level. Therefore, MTH 141: Calculus 1 & MTH 142: Calculus 2 requirements at UB shall be waived).
④	Course PHY F110: Physics Laboratory is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to PHY 151LAB - Physics Lab 1 a required course offered at UB.
⑤	Course PHY F111: Mechanics, Oscillations and Waves is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to PHY 107LR: General Physics 1 a required course offered at UB.
⑥	Course BITS F110: Engineering Graphics is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to EAS 999TR177/MAE 177: Engineering Drawing and CAD a required course offered at UB.
⑦	Course ENG 105: Writing and Rhetoric is the required course offered at UB. It would be offered by UB to fulfill UB requirement through online mode. It may be considered as Open Elective for BITS requirement by mapping with courses such as GS F223 Introduction to Mass Communication or GS F325 Journalism or GS F326 Creative Thinking or GS F344 Copywriting. This course can be considered as the 1st Open Elective course out of 5 required at BITS.

⑧	Course CS F111: Computer Programming is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to EAS 240: Introduction to Programming for Engineers a required course offered at UB. Both courses are mapped to fulfill the requirement of the respective Institutes.
⑨	Course MATH F113: Probability and Statistics is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to EE 305: Applied Probability a required course at UB.
⑩	Course EEE F111: Electrical Sciences is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to EE 202: Circuit Analysis a required course offered at UB.
⑪	Course PHY 108: Physics 2 is the required course offered at UB. It would be offered by UB to fulfill UB requirement through online mode. It will be considered as equivalent to ECE F212 Electromagnetic Theory offered at BITS.
⑫	ELI 105: Writing and Rhetoric is required only if students were placed into ELI 100 in first fall term (Students who do not meet placement requirements. These students would then take ELI 105 in the summer between Year 1 and Year 2, remotely online offered by UB).
⑫-A	The course is required to offered to fulfill Humanities Elective Requirement at BITS Only. This would be the 1st Humanities Elective (HUEL) out of total required 3 HUELs. Students shall choose one course from the following three courses: HSS F234 or HSS F318 or HSS F333; HSS F235 or HSS F313 or HSS F343 or HSS 353 or HSS F399.
⑬	Course MATH F211: Mathematics III is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to MTH 306: Differential Equations a required course offered at UB.
⑭	Course ECE F211: Electrical Machines is the required core course offered at BITS. Also, this course will be considered as equivalent to EE 425: Electrical Devices offered at UB.
⑮	Course ECE F314: EM Fields and Microwave Engineering is a required core course at BITS. It will be considered as equivalent to EE 324 Electromagnetic Theory required at UB.
⑯	Course ECE F215: Digital Design is a required core course at BITS in 2nd Year. Also, this course will be considered as equivalent to EE 178: Digital Principles offered at UB.
⑰	Course EAS 360: STEM Communications is the required course offered at UB. It will be considered as an equivalent to BITS F112: Technical Report Writing a required foundation course at BITS Pilani.
⑱-A	Course ECE F241: Microprocessors and Interfacing is a required core course at BITS. Also, this course will be considered as equivalent to EE 379: Embedded Systems and Application a required course at UB.
⑱	Course ECE F243: Signals & Systems is a required core course offered at BITS. Also, this course will be considered as equivalent to EE 205: Signal Analysis and Transform Methods offered at UB.
⑲	BITS F225: Environmental Studies is the required foundation course at BITS. It will be considered as equivalent to EVS 118: Intro Environment and Sustainability Studies offered at UB. Course EVS 118 Intro Environment and Sustainability Studies will also fulfill the requirement of a course at UB offered under Thematic or Global Pathway category. Thus it will fulfill the requirement of 1st course under Thematic or Global Pathway category out of the total required 4 courses required under this category. (It would be offered by UB to fulfill UB requirement of all students through online mode).
⑳	This would be the 2nd Humanities Elective (HUEL) out of total required 3 HUELs. Students should select this course in such a way that the selected course will not only fulfill the requirement of a course at UB offered under Thematic or Global Pathway category but also fulfill Humanities electives requirement of BITS Pilani. Thus it will fulfill the requirement of 2nd course under Thematic or Global Pathway category out of the total required 4 courses required under this category.
㉑	Course EE 310: Electronic Devs & Circs 1 is a required course at UB. Also, this course will be considered as equivalent to ECE F214: Electronic Devices a required core course offered at BITS.

㉒	Course EE 352: Introduction to Electronic Laboratory is a required course offered at UB. Also, this course will be considered as 1st Discipline Elective course out of 4 required at BITS.
㉓	Course EAS 230: Engineering Computations/ MTH 309: Introductory Linear Algebra is the required course offered at UB. This will be as the 3rd Open Elective course required at BITS.
㉔	This would be the 3rd Humanities Elective (HUEL) out of total required 3 HUELs. Students should select this course in such a way that the selected course will not only fulfill the requirement of a course at UB offered under Thematic or Global Pathway category but also fulfill Humanities electives requirement of BITS Pilani. Thus it will fulfill the requirement of 3rd course under Thematic or Global Pathway category out of the total required 4 courses required under this category.
㉕	Course EE 311: Electronic Devs & Circs 2 is a required course at UB. Also, this course will be considered as equivalent to ECE F244: Microelectronic Circuits a required core course offered at BITS.
㉖	Course EE 383: Communications Systems is a required course offered at UB. Also, this course will be considered as equivalent to a required core course ECE F311: Communication Systems offered at BITS.
㉗	Course EE 336: Fundamentals of Energy Systems is a required course offered at UB. Also, this course will be considered as 2nd Discipline Elective course out of 4 required at BITS.
㉘	Course EE 353: Electronic Circuits is a required course offered at UB. Also, this course will be considered as 3rd Discipline Elective course out of 4 required at BITS.
㉙	Course PHY 207: General Physics 3 is a required course offered at UB. Also, this course will be considered as 4th Open Elective course required at BITS.
㉚	The students would be registering in both Courses EE 408: Senior Seminar and EE 499: Independent Study that would be tied to the senior design project for these students. Also, these two courses can be considered as equivalent to First Capstone Project, namely BITS F456: Capstone Project I to be offered at BITS Pilani. All BITS-UB students have to do two Capstone Projects in place of Practice School II/Thesis.
㉛	Course EE 494: Senior Capstone Design Project is the core course offered at UB. Also, this will be equivalent to BITS F457: Capstone Project II to be offered at BITS Pilani. All BITS-UB students have to do two Capstone Projects in place of Practice School II/Thesis.
㉜	Course EE 478: HDL Based Digital Design with Programmable Logic is the required course offered at UB. Also, this course will be considered as 5th Open Elective course required at BITS.
㉝	BITS-UB Students shall be advised to take the course EE 491: Analog Integrated Circuits mandatorily. This will be the 1st Technical Elective course out three from list of Technical Electives required at UB and will be treated as equivalent to a required core course offered at BITS, namely ECE F341: Analog Electronics.
㉞	BITS-UB Students will take the 1st course out two from list of Electrical Engineering Electives required at UB. Also, this course will be considered as 4th Discipline Elective course out of 4 required at BITS.
㉟	This would be the 4th course at UB offered under Thematic or Global Pathway category. Also, this course will be considered as the 6th Open Elective course required at BITS.
㊱	BITS-UB Students shall be advised to take the course EE 434: Principles of Networking mandatorily. This will be the 2nd course out two from list of EE Electives required at UB and will be treated as a required core course offered at BITS, namely ECE F343: Communication Networks.
㊲	Course EE 439: Principle of Information Theory and Coding is to be offered at UB. BITS-UB Students shall be advised to take this course mandatorily as one of the Technical Electives required at UB and will be considered as equivalent to a required core course namely ECE F344 Information Theory and Coding offered at BITS.
㊳	Course ECE F434: Digital Signal Processing is a required core course at BITS. The UB Team shall develop a course that aligns with BITS' ECE F434. Once a course is developed by UB Team, the new introduced course will be substituted with it (=ECE F434 Digital Signal Processing) as one of the Technical Electives required at UB for UBITS students.

Semester-wise Pattern for Students Admitted to B.E. Electrical and Electronics under BITS – UB								
Year	**First Semester**			**U**	**Second Semester**			**U**
	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice	2
	CHEM	F110	Chemistry Laboratory ①	1	BITS	F111	Thermodynamics	3
	CHEM	F111	General Chemistry ②	3	CS	F111	Computer Programming ⑦	4
	MATH	F111	Mathematics I ③	3	MATH	F113	Probability and Statistics ⑧	3
	PHY	F110	Physics Laboratory	1	EEE	F111	Electrical Sciences ⑨	3
	PHY	F111	Mechanics, Oscillations and Waves ④	3	PHY	108	Physics 2 ⑩	4
	BITS	F110	Engineering Graphics ⑤	2				
	ELI	100 or 105	Intro to Academic Writing (offered by UB to fulfill UBC CL1 requirement ⑥	3 Or 4				
				21				**22**
Summer Term								
ELI 105: Writing and Rhetoric ONLY if students were placed into ELI 100 in first fall term ⑪								4
1st Humanities Elective ⑫								3
II	MATH	F211	Mathematics III ⑬	3	ECON Or MGTS	F211 Or F211	Principles of Economics Or Principles of Management	3
	EEE	F211	Electrical Machines	4	EEE	F241	Microprocessors and Interfacing ⑰-A	4
	EEE	F214	Electronic Devices ⑭	3	EEE	F242	Control Systems	3
	EEE	F215	Digital Design ⑮	4	EEE	F243	Signals & Systems ⑰	3
	MATH ME	F212 **OR** F344	Optimization Engineering Optimization	3 2	EEE	F244	Microelectronics Circuits ⑱	3
	EAS	360	STEM Communications ⑯	3	BITS	F225	Environmental Studies ⑲ **<PW1>**	3
					DIV		Thematic Pathway List 1 Course to satisfy Diversity requirement **<PW2>** ⑳	3
				20				**22**
III	EE	352	Intro Electronics Lab ㉑	3	PHY	207	General Physics 3 ㉕	4
	EE	324	Applied Electromagnetics ㉒	4	PHY	257	General Physics 3 Laboratory	1
	EE OR MTH	230 OR 309	Engineering Computations OR Intro Linear Algebra ㉓	3 4	EE	383	Communications Systems I ㉖	3
			Thematic or Global Pathway Course ㉔**<PW3>**	3	EE	336	Fundamentals of Energy Systems ㉗	3
	EAS	198	UB Seminar	1	EE	353	Electronic Circuits ㉘	3
	PHY	158	General Physics II Lab	1				
				15				**14**
IV	EE EE	408 499	Senior Seminar Independent Study ㉙	1 3	EE	494	Senior Capstone Design Project ㉚	3
	EE	478	HDL Based Digital Design with Programmable Logic ㉛	3	EE	467	Power Electronics ㉟	3
	EE	491	Analog Integrated Circuits ㉜	3	CSE	493	Introduction to VLSI Electronics ㊱	4
			Thematic or Global Pathway Course ㉝ **<PW4>**	3	EE	482	Power Systems Engineering I ㊲	4
			Technical Elective 2 ㉞	3	UBC	399	UB Curriculum Capstone	1
				16				**15**

Note: Units/Credit points earned for the course(s) in BITS Pilani and UB shall be considered towards degrees to be awarded by both institutions in accordance with the following:

1. To complete the BITS Pilani Degree, students need to complete a minimum total of 147 units with a minimum number of 47 courses (four courses with 12 units offered jointly by UB (online) and BITS + 26 courses with 77 units (min.) offered by BITS in first two years + 18 courses with 58 equivalent units offered by UB). The Equivalent Unit is considered by assuming that a course of 1 units offered at BITS Pilani is equivalent to a 1 credit points course offered by UB.
2. To complete the UB Degree, students need to complete 129 credit points in total (2 courses with 8 credit points waived + 4 courses with 14 credit points offered jointly by UB (online) & BITS + 16 mapped courses with 47 equivalent credit points offered by BITS in the first two years + 22 courses with 60 credit points offered by UB).
3. Upon completion of all BITS Pilani Courses during Years 1 and 2 (including summer term, if any) at the BITS Campus, students will receive 47 credit points as an UB credit exemption against the 16 mapped courses to complete the UB Degree in accordance with UB's policies and procedures.
4. Upon completion of all UB Courses, students will receive 70 (=12+58) units of transfer credit for the 21 (=4+17) mapped courses to complete the BITS Pilani Degree in accordance with BITS' policies and procedures.
5. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani and UB.
6. The details of an encircled number given against the selected courses in the semester-wise pattern are given below:

Symbol	Description
①	Course CHEM F110: Chemistry Laboratory is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to CHE 113LAB: General Chemistry for Engineers Laboratory 1a required course offered at UB.
②	Course CHEM F111: General Chemistry is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to CHE 999: Chemistry 1 a required course offered at UB.
③	Course MATH F111: Mathematics I is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to MTH 241: Calculus 3 a required course offered at UB. (Note: Though the Courses MTH 141: Calculus 1 & MTH 142: Calculus 2 are the foundation courses offered at UB, their course contents are overlapping with the NCERT syllabus, which are studied by the students at their Higher secondary level. Therefore, MTH 141: Calculus 1 & MTH 142: Calculus 2 requirements at UB shall be waived).
④	Course PHY F111: Mechanics, Oscillations and Waves is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to PHY 107LR: General Physics 1 a required course offered at UB.
⑤	Course BITS F110: Engineering Graphics is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to EAS 999TR177/MAE 177: Engineering Drawing and CAD a required course offered at UB.
⑥	Course ENG 105: Writing and Rhetoric is the required course offered at UB. It would be offered by UB to fulfill UB requirement through online mode. It may be considered as Open Elective for BITS requirement by mapping with courses such as GS F223 Introduction to Mass Communication or GS F325 Journalism or GS F326 Creative Thinking or GS F344 Copywriting. This course can be considered as the 1st Open Elective course out of 5 required at BITS.

Symbol	Description
⑦	Course CS F111: Computer Programming is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to EAS 240: Introduction to Programming for Engineers a required course offered at UB. Both courses are mapped to fulfill the requirement of the respective Institutes.
⑧	Course MATH F113: Probability and Statistics is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to EE 305: Applied Probability a required course at UB.
⑨	Course EEE F111: Electrical Sciences is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to EE 202: Circuit Analysis a required course offered at UB.
⑩	Course PHY 108: Physics 2 is the required course offered at UB. It would be offered by UB to fulfill UB requirement through online mode. It will be considered as equivalent to EEE F212 Electromagnetic Theory offered at BITS.
⑪	ELI 105: Writing and Rhetoric is required only if students were placed into ELI 100 in first fall term (Students who do not meet placement requirements. These students would then take ELI 105 in the summer between Year 1 and Year 2, remotely online offered by UB).
⑫	The course is required to offered to fulfill Humanities Elective Requirement at BITS Only. This would be the 1st Humanities Elective (HUEL) out of total required 3 HUELs. Students shall choose one course from the following three courses: HSS F234 or HSS F318 or HSS F333; HSS F235 or HSS F313 or HSS F343 or HSS 353 or HSS F399.
⑬	Course MATH F211: Mathematics III is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to MTH 306: Differential Equations a required course offered at UB.
⑭	Course EEE F214: Electronic Devices is a required core course offered at BITS. Also, this course will be considered as equivalent to EE 310: Electronic Devs & Circs 1 offered at UB.
⑮	Course EEE F215: Digital Design is a required core course at BITS in 2nd Year. Also, this course will be considered as equivalent to EE 178: Digital Principles offered at UB.
⑯	Course EAS 360: STEM Communications is the required course offered at UB. It will be considered as an equivalent to BITS F112: Technical Report Writing a required foundation course at BITS Pilani.
⑰-A	Course EEE F241: Microprocessors and Interfacing is a required core course at BITS. Also, this course will be considered as equivalent to EE 379: Embedded Systems and Application a required course at UB.
⑰	Course EEE F243: Signals & Systems is a required core course offered at BITS. Also, this course will be considered as equivalent to EE 205: Signal Analysis and Transform Methods offered at UB.
⑱	Course EEE F244: Microelectronic Circuits is a required core course offered at BITS. Also, this course will be considered as equivalent to a required course EE 311: Electronic Devs & Circs 2 offered at UB.
⑲	BITS F225: Environmental Studies is the required foundation course at BITS. It will be considered as equivalent to EVS 118: Intro Environment and Sustainability Studies offered at UB. Course EVS 118 Intro Environment and Sustainability Studies will also fulfill the requirement of a course at UB offered under Thematic or Global Pathway category. Thus it will fulfill the requirement of 1st course under Thematic or Global Pathway category out of the total required 4 courses required under this category. (It would be offered by UB to fulfill UB requirement of all students through online mode).
⑳	This would be the 2nd Humanities Elective (HUEL) out of total required 3 HUELs. Students should select this course in such a way that the selected course will not only fulfill the requirement of a course at UB offered under Thematic or Global Pathway category but also fulfill Humanities electives requirement of BITS Pilani. Thus it will fulfill the requirement of 2nd course under Thematic or Global Pathway category out of the total required 4 courses required under this category.

Symbol	Description
㉑	Course EE 352: Introduction to Electronic Laboratory is a required course offered at UB. Also, this course will be considered as 1st Discipline Elective course out of 4 required at BITS.
㉒	Course EE 324: Applied Electromagnetics is a required course offered at UB. Also, this course will be considered as 2nd Open Elective course out of 5 required at BITS.
㉓	Course EAS 230: Engineering Computations/ MTH 309: Introductory Linear Algebra is the required course offered at UB. This will be as the 3rd Open Elective course required at BITS.
㉔	This would be the 3rd Humanities Elective (HUEL) out of total required 3 HUELs. Students should select this course in such a way that the selected course will not only fulfill the requirement of a course at UB offered under Thematic or Global Pathway category but also fulfill Humanities electives requirement of BITS Pilani. Thus it will fulfill the requirement of 3rd course under Thematic or Global Pathway category out of the total required 4 courses required under this category.
㉕	Course PHY 207: General Physics 3 is a required course offered at UB. Also, this course will be considered as 4th Open Elective course required at BITS.
㉖	Course EE 383: Communications Systems is a required course offered at UB. Also, this course will be considered as equivalent to a required core course EEE F311: Communication Systems offered at BITS.
㉗	Course EE 336: Fundamentals of Energy Systems is a required course offered at UB. Also, this course will be considered as 2nd Discipline Elective course out of 4 required at BITS.
㉘	Course EE 353: Electronic Circuits is a required course offered at UB. Also, this course will be considered as 3rd Discipline Elective course out of 4 required at BITS.
㉙	The students would be registering in both Courses EE 408: Senior Seminar and EE 499: Independent Study that would be tied to the senior design project for these students. Also, these two courses can be considered as equivalent to First Capstone Project, namely BITS F456: Capstone Project I to be offered at BITS Pilani. All BITS-UB students have to do two Capstone Projects in place of Practice School II/Thesis.
㉚	Course EE 494: Senior Capstone Design Project is the core course offered at UB. Also, this will be equivalent to BITS F457: Capstone Project II to be offered at BITS Pilani. All BITS-UB students have to do two Capstone Projects in place of Practice School II/Thesis.
㉛	Course EE 478: HDL Based Digital Design with Programmable Logic is the required course offered at UB. Also, this course will be considered as 5th Open Elective course required at BITS.
㉜	BITS-UB Students shall be advised to take the course EE 491: Analog Integrated Circuits mandatorily. This will be the 1st Technical Elective course out three from list of Technical Electives required at UB and will be treated as equivalent to a required core course offered at BITS, namely EEE F341: Analog Electronics.
㉝	This would be the 4th course at UB offered under Thematic or Global Pathway category. Also, this course will be considered as the 6th Open Elective course required at BITS.
㉞	BITS-UB Students shall take this course as 2nd Technical Elective required at UB and will be treated as the 4th Discipline Elective required at BITS. This course is required to fulfill 4th Discipline Course requirement of BITS.
㉟	BITS-UB Students shall be advised to take the course EE 467: Power Electronics mandatorily. This will be the 2nd course out two from list of EE Electives required at UB and will be treated as a required core course offered at BITS, namely EEE F342: Power Electronics.
㊱	Course CSE 493: Introduction to VLSI Electronics is to be offered at UB. BITS-UB Students shall be advised to take this course mandatorily as one of the Technical Electives required at UB and will be considered as equivalent to EEE F313: Analog & Digital VLSI Design a required core course offered at BITS.
㊲	Course EE 482: Power Systems Engineering I is to be offered at UB. BITS-UB Students shall take this course mandatorily as one of the EE Electives required at UB and will be considered as equivalent to EEE F312: Power Systems a required core course offered at BITS.

Semester-wise Pattern for Students Admitted to B.E. Mechanical under BITS – UB								
Year	**First Semester**			**U**	**Second Semester**			**U**
I	BIO	F110	Biology Laboratory	1	MATH	F112	Mathematics II	3
	BIO	F111	General Biology	3	ME	F112	Workshop Practice ⑧	2
	CHEM	F110	Chemistry Laboratory ①	1	BITS	F111	Thermodynamics	3
	CHEM	F111	General Chemistry ②	3	CS	F111	Computer Programming ⑨	4
	MATH	F111	Mathematics I ③	3	MATH	F113	Probability and Statistics ⑩	3
	PHY	F110	Physics Laboratory ④	1	EEE	F111	Electrical Sciences ⑪	3
	PHY	F111	Mechanics, Oscillations and Waves ⑤	3	PHY	108	Physics 2 ⑫	4
	BITS	F110	Engineering Graphics ⑥	2				
	ELI	100 or 105	Introduction to Academic Writing (offered by UB to fulfill UBC CL1 requirement ⑦	3 Or 4				
				20				**22**
Summer Term								
ELI 105: Writing and Rhetoric ONLY if students were placed into ELI 100 in first fall term ⑬								**4**
Humanities Elective ⑬-A								3
Year	**First Semester**			**U**	**Second Semester**			**U**
II	MATH	F211	Mathematics III ⑭	3	ECON Or MGTS	F211 Or F211	Principles of Economics Or Principles of Management	3
	ME	F211	Mechanics of Solids ⑮	3	ME	F218	Advanced Mechanics of Solids ⑳	3
	ME	F216	Materials Science and Engineering ⑯	3	ME	317	Engines, Motors, and Mobility	2
	ME	F217	Applied Thermodynamics ⑰	4	BITS	F225	Environmental Studies ㉑	3
	ME	F320	Engineering Optimization ⑱	3	ME	F221	Mechanisms and Machines	3
	ME	F219	Manufacturing Processes ㉒	4	ME	F315	Advanced Manufacturing Processes	3
	EAS	360	STEM Communications ⑲	3	EAS	208	Dynamics ㉓	3
				23				**20**
Year	**First Semester**			**U**	**Second Semester**			**U**
III	MAE	277	Introduction to ME Practice ㉔	3	MAE	311	Machines & Mechanisms 1 ㉙	3
	MAE	335	Fluid Mechanics ㉕	3	MAE	336	Heat Transfer ㉚	3
	MAE	340	Dynamic Systems ㉖	3	MAE	334	Mechanical & Aerospace Engg Laboratory I ㉛	2
	MAE	376	Applied Math for MAEs ㉗	3	MAE	385	Engineering Materials Lab ㉜	1
	EAS	198	UB Seminar ㉘	1			Professional/Science Track ㉝	3
	PHY	158	General Physics II Lab	1	MAE	467	Vibration and Shock I㉞	3
				14				**15**
Year	**First Semester**			**U**	**Second Semester**			**U**
IV	MAE	451	Design Process & Methods ㉟	3	MAE	494	Design Project ㊱	3
	MAE	338	MAE Laboratory II ㊲	2	UBC	399	UB Capstone	1
	MAE	377	Product Design in a CAE Environment ㊳	3			MAE Technical Electives ㊷	3
			MAE Technical Electives ㊴	3			Professional/Science Track ㊸	3
			Thematic/Global Pathway Course ㊵	3			Thematic Pathway List 1 Course to satisfy Diversity requirement ㊹	3
			Thematic/Global Pathway Course ㊶	3				
				17				**13**

Note: Units/Credit points earned for the course(s) in BITS Pilani and UB shall be considered towards degrees to be awarded by both institutions in accordance with the following:

1. To complete the BITS Pilani Degree, students need to complete a minimum total of 144 units with a minimum number of 49 courses (four courses with 10 units offered jointly by BITS and UB + 27 courses with 72 units (min.) offered by BITS in first two years + 19 courses with 59 equivalent units offered by UB). The Equivalent Unit is considered by assuming that a course of 1 units offered at BITS Pilani is equivalent to a 1 credit points course offered by UB.
2. To complete the UB Degree, students need to complete 122 credit points in total (4 courses with 14 credit points offered jointly by UB and BITS + 17 mapped courses with 49 equivalent credit points offered by BITS in the first two years + 23 courses with 59 credit points offered by UB).
3. Upon completion of all BITS Pilani Courses during Years 1 and 2 (including summer term, if any) at the BITS Campus, students will receive 49 credit points as an UB credit exemption against the 17 mapped courses to complete the UB Degree in accordance with UB's policies and procedures.
4. Upon completion of all UB Courses, students will receive 59 units of transfer credit for the 19 mapped courses to complete the BITS Pilani Degree in accordance with BITS' policies and procedures.
5. The actual units mapping of the courses shall be decided based on the equivalent courses offered at BITS Pilani and UB.
6. The details of an encircled number given against the selected courses in the semester-wise pattern are given below:

Symbol	Description
①	Course CHEM F110: Chemistry Laboratory is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to CHE 113LAB: General Chemistry for Engineers Laboratory 1a required course offered at UB.
②	Course CHEM F111: General Chemistry is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to CHE 999: Chemistry 1 a required course offered at UB.
③	Course MATH F111: Mathematics I is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to MTH 241: Calculus 3 a required course offered at UB. (Note: Though the Courses MTH 141: Calculus 1 & MTH 142: Calculus 2 are the foundation courses offered at UB, their course contents are overlapping with the NCERT syllabus, which are studied by the students at their Higher secondary level. Therefore, MTH 141: Calculus 1 & MTH 142: Calculus 2 requirements at UB shall be waived).
④	Course PHY F110: Physics Laboratory is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to PHY 151LAB - Physics Lab 1 a required course offered at UB.
⑤	Course PHY F111: Mechanics, Oscillations and Waves is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to PHY 107LR: General Physics 1 a required course offered at UB.
⑥	Course BITS F110: Engineering Graphics is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to EAS 999TR177/MAE 177: Engineering Drawing and CAD a required course offered at UB.
⑦	Course ENG 105: Writing and Rhetoric is the required course offered at UB. It would be offered by UB to fulfill UB requirement through online mode. It may be considered as Open Elective for BITS requirement by mapping with courses such as GS F223 Introduction to Mass Communication or GS F325 Journalism or GS F326 Creative Thinking or GS F344 Copywriting. This course can be considered as the 1st Open Elective course out of 5 required at BITS.
⑧	ME F112: Workshop Practice is a required foundation course at BITS. This course will be considered as equivalent to Course EAS 999TR100 as a 100-level technical elective at UB.

Symbol	Description
⑨	Course CS F111: Computer Programming is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to CSE 115/EAS 230: Engineering Computations a required course offered at UB. Both courses are mapped to fulfill the requirement of the respective Institutes.
⑩	Course MATH F113: Probability and Statistics is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to STA 301 Introduction to Probability, a course available for Senior Students at UB.
⑪	Course EEE F111: Electrical Sciences is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to EE 202LR: Circuit Analysis a required course offered at UB.
⑫	Course PHY 108: Physics 2 is the required course offered at UB. It would be offered by UB to fulfill UB requirement through online mode. It will be considered as Open Elective for BITS Requirement.
⑬	ELI 105: Writing and Rhetoric is required only if students were placed into ELI 100 in first fall term (Students who do not meet placement requirements. These students would then take ELI 105 in the summer between Year 1 and Year 2, remotely online offered by UB).
⑬-A	The course is required to offered to fulfill Humanities Elective Requirement at BITS Only. This would be the 1st Humanities Elective (HUEL) out of total required 3 HUELs. Students shall choose one course from the following three courses: HSS F234 or HSS F318 or HSS F333; HSS F235 or HSS F313 or HSS F343 or HSS 353 or HSS F399.
⑭	Course MATH F211: Mathematics III is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to MTH 306: Differential Equations a required course offered at UB.
⑮	Course ME F211: Mechanics of Solids is a required core course at BITS Pilani. This course will be considered as equivalent to EAS 207: Statics as one of the foundation course offered at UB.
⑯	Course ME F216: Materials Science and Engineering is a required core course at BITS Pilani. This course will be considered as equivalent to MAE 381: Engineering Materials 1 a required course offered at UB.
⑰	Course ME F217: Applied Thermodynamics is a required core course at BITS Pilani. This course will be considered as equivalent to MAE 204: Thermodynamics 1 a required course offered at UB.
⑱	Course ME F320: Engineering Optimization is shifted from 3rd Year to Second Year to fulfill overall course requirement of BITS Pilani.
⑲	Course EAS 360: STEM Communications is the required course offered at UB. It will be considered as an equivalent to BITS F112: Technical Report Writing a required foundation course at BITS Pilani.
⑳	Course ME F218 Advanced Mechanics of Solids is a required core course at BITS Pilani. This course will be considered as equivalent to EAS 209: Mechanics of Solids a required course offered at UB.
㉑	BITS F225: Environmental Studies is the required foundation course at BITS. It will be considered as equivalent to EVS 118: Intro Environment and Sustainability Studies offered at UB. Course EVS 118 Intro Environment and Sustainability Studies will also fulfill the requirement of a course at UB offered under Thematic or Global Pathway category. Thus it will fulfill the requirement of 1st course under Thematic or Global Pathway category out of the total required 4 courses required under this category. (It would be offered by UB to fulfill UB requirement of all students through online mode).
㉒	Course ME F219: Manufacturing Processes is a required core course at BITS Pilani. This course will be considered as equivalent to MAE 364: Manufacturing Processes a required course offered at UB.

Symbol	Description
㉓	The course EAS 208: Dynamics is the required course offered at UB. It would be offered by UB to fulfill UB requirement through online mode.
㉔	Course MAE 277: Introduction to Mechanical and Aerospace Engineering Practice is the required course offered at UB. Also, this course will be considered as equivalent to ME F316: Manufacturing Management a required core course offered at BITS.
㉕	Course MAE 335: Fluid Mechanics is the required course offered at UB. Also, this course will be considered as equivalent to ME F212: Fluid Mechanics a required core course offered at BITS.
㉖	Course MAE 340: Dynamic Systems is the required course offered at UB. Also, this course will be considered as equivalent to ME F319: Vibrations and Control a required core course offered at BITS Pilani.
㉗	Course MAE 376: Applied Math for Mechanical and Aerospace Engineering is the required course offered at UB. Also, this will be considered as the 3rd Open course out of 4 required courses at BITS, either as a project type course or a new elective to be introduced.
㉘	Course EAS 198: UB Seminar is a required course offered at UB.
㉙	Course MAE 311: Machines & Mechanisms 1 is the required course offered in 3rd year at UB. Also, this will be equivalent to ME F314: Design of Machine Elements a required core course offered at BITS Pilani.
㉚	Course MAE 336: Heat Transfer is the required course offered at UB. Also, this course will be considered as equivalent to ME F220: Heat Transfer a required core course offered at BITS Pilani.
㉛	Course MAE 334: MAE Laboratory I is the required course offered at UB. Also, this will be considered as the 1st Discipline course out of 4 required courses at BITS, either as a project type course or a new elective to be introduced.
㉜	Course MAE 385: Engineering Materials Lab is the required course offered at UB. Also, this lab will be part of ME F216: Materials Science and Engineering required at BITS as specified under 14 above.
㉝	This course would be the 1st required course under the Professional/Science Track pool out of the total 2 required courses under this category at UB. Also, this course will be considered as the 4th Open Elective course out of 5 required at BITS.
㉞	MAE 467: Vibration and Shock I would be offered as an MAE technical elective, which would be the 1st MAE Technical Elective out of the total required 3 courses required under this category at UB. This will also be considered as the 2nd Discipline Elective course out of 4 required at BITS. Students should select this course from the pool of MAE technical electives offered at UB in such a way that the selected course will also fulfill the requirement of a course at BITS offered under the pool of Discipline electives category.
㉟	Course MAE 451: Design Process & Methods is the required course offered at UB. Also, this will be equivalent to BITS F456: Capstone Project I to be offered at BITS Pilani. All BITS-UB students have to do two Capstone Projects in place of Practice School II/Thesis.
㊱	Course MAE 494: Design Project is the required course offered at UB. Also, this will be equivalent to BITS F457: Capstone Project II to be offered at BITS Pilani. All BITS-UB students have to do two Capstone Projects in place of Practice School II/Thesis.
㊲	Course MAE 338: MAE Laboratory II is the required course offered in 3rd year at UB. Also, this will be equivalent to ME F341: Prime Movers & Fluid Machines a required core course offered at BITS Pilani.
㊳	Course MAE 377: Product Design in a CAE Environment offered at UB. Also, this will be treated as equivalent to ME F318: Computer Aided Design a required core course offered at BITS Pilani.

Symbol	Description
㊴	This course would be the 2nd MAE Technical Elective out of the total required 3 courses required under this category at UB. This would also be considered as the 3rd Discipline Elective course out of 4 required at BITS. Students should select this course from the pool of MAE technical electives offered at UB in such a way that the selected course will also fulfill the requirement of a course at BITS offered under the pool of Discipline electives category.
㊵	This would be the 2nd Humanities Elective (HUEL) out of total required 3 HUELs. Students should select this course in such a way that the selected course will not only fulfill the requirement of a course at UB offered under Thematic or Global Pathway category but also fulfill Humanities electives requirement of BITS Pilani. Thus it will fulfill the requirement of 2nd course under Thematic or Global Pathway category out of the total required 4 courses required under this category.
㊶	This would be the 3rd Humanities Elective (HUEL) out of total required 3 HUELs. Students should select this course in such a way that the selected course will not only fulfill the requirement of a course at UB offered under Thematic or Global Pathway category but also fulfill Humanities electives requirement of BITS Pilani. Thus it will fulfill the requirement of 3rd course under Thematic or Global Pathway category out of the total required 4 courses required under this category.
㊷	This course would be the 3rd MAE Technical Elective out of the total required 3 courses required under this category at UB. This would also be considered as the 4th Discipline Elective course out of 4 required at BITS. Students should select this course from the pool of MAE technical electives offered at UB in such a way that the selected course will also fulfill the requirement of a course at BITS offered under the pool of Discipline electives category.
㊸	This course would be the 2nd required course under the Professional/Science Track pool out of the total 2 required courses under this category at UB. Also, this course can be considered as the 5th Open Elective course out of 5 required at BITS.
㊹	This would be the 4th course at UB offered under Thematic or Global Pathway category. Also, this course may be considered as the 6th Open Elective course out of 5 required at BITS.