



B.E. Mechanical at BITS Pilani and B.S. Mechanical Engineering at UB

Program Plan, Semester wise Pattern and Credit Arrangements

Schedule A1 – Credit Map detailing

The collaborative ‘dual degree’ programmes at the international level will be offered in collaboration with University at Buffalo in the same specialization and at the same qualification level. The general curricular structure for the students admitted under Augmented Collaborative Articulation Pathway under BITS-UB collaboration is given in **Table 1**. In this 4-year collaborative ‘dual degree’ programme, students will spend the first two years along with a summer term (if required) at BITS Pilani campuses before transferring to the University at Buffalo in the USA for the remaining two years (i.e., years 3 and 4) of their study period. To fulfil the requirements, the programme mapping has been done to fulfil the degree requirements of both the Universities. The semester-wise pattern for students admitted to B.E. Mechanical (BITS) / B.S. Mechanical Engineering (UB) programme to be offered under BITS – UB is given below.

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 UB. 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 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 for the UB degree UB will transfer the number of credits assigned by BITS to its courses.

Table 1: Semester-wise Pattern for Students Admitted to B.E. Mechanical at BITS Pilani and B.S. Mechanical Engineering at UB under BITS – UB 2+2 International Collaborative Programmes

Semester-wise Pattern for Students Admitted to B.E. Mechanical under BITS – UB								
Year	First Semester			U	Second Semester			U
	BIO	F110	Biology Laboratory ^①	1	MATH	F112	Mathematics II ^⑩	3
	BIO	F111	General Biology ^②	3	ME	F112	Workshop Practice ^⑪	2
	CHEM	F110	Chemistry Laboratory ^③	1	BITS	F111	Thermodynamics ^⑫	3
	CHEM	F111	General Chemistry ^④	3	BITS	F235	Digital Fundamentals ^⑬	4
	MATH	F111	Mathematics I ^⑤	3	MATH	F113	Probability and Statistics ^⑭	3
	PHY	F110	Physics Laboratory ^⑥	1	EEE	F111	Electrical Sciences ^⑮	3
	PHY	F111	Mechanics, Oscillations and Waves ^⑦	3	PHY	108	Physics 2 ^⑯	4
	BITS	F234	Introduction to Engineering Design ^⑧	4				
	ELI	100 or 105	Introduction to Academic Writing (offered by UB to fulfill UBC CL1 requirement ^⑨)	3 Or 4				
				22				22
Summer Term								
	ELI 105: Writing and Rhetoric ONLY if students were placed into ELI 100 in first fall term ^⑰							4
	Humanities Elective ^⑱							3



Semester-wise Pattern for Students Admitted to B.E. Mechanical under BITS – UB								
Year	First Semester			U	Second Semester			U
II	MATH	F211	Mathematics III (19)	3	ECON Or MGTS	F211 Or F211	Principles of Economics Or Principles of Management (26)	3
	ME	F211	Mechanics of Solids (20)	3	ME	F218	Advanced Mechanics of Solids (27)	3
	ME	F216	Materials Science and Engineering (21)	3	ME	F317	Engines, Motors, and Mobility (28)	2
	ME	F217	Applied Thermodynamics (22)	4	BITS	F225	Environmental Studies (29)	3
	ME	F320	Engineering Optimization (23)	3	ME	F221	Mechanisms and Machines (30)	3
	ME	F219	Manufacturing Processes (24)	4	ME	F315	Advanced Manufacturing Processes (31)	3
	EAS	360	STEM Communications (25)	3	EAS	208	Dynamics (32)	3
				23 (min)				20 (min)
III	MAE	277	Introduction to ME Practice (33)	3	MAE	311	Machines & Mechanisms 1 (39)	3
	MAE	335	Fluid Mechanics (34)	3	MAE	336	Heat Transfer (40)	3
	MAE	340	Dynamic Systems (35)	3	MAE	334	Mechanical & Aerospace Engg Laboratory I (41)	2
	MAE	376	Applied Math for MAEs (36)	3	MAE	385	Engineering Materials Lab (42)	1
	EAS	198	UB Seminar (37)	1			General Technical Electives (43)	3
	PHY	158	General Physics II Lab (38)	1	MAE	341	Feedback Control Systems (44)	3
				14				15
Year	First Semester			U	Second Semester			U
IV	MAE	451	Design Process & Methods (45)	3	MAE	494	Design Project (51)	3
	MAE	338	MAE Laboratory II (46)	2	UBC	399	UB Capstone (52)	1
	MAE	377	Product Design in a CAE Environment (47)	3			MAE Technical Electives (53)	3
			MAE Technical Electives (48)	3	MAE	467	Vibration and Shocks I (54)	3
			Thematic/Global Pathway Course (49)	3			Thematic Pathway List 1 Course to satisfy Diversity requirement (55)	3
			Thematic/Global Pathway Course (50)	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:

- 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 77 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.
- To complete the UB degree, students follow degree requirements in effect in the UB Undergraduate Catalogue as of the date they initially enroll in the UBITS programme; accordingly, they need to complete 43 course-based requirements in total (4 courses offered online by UB in the first two years and 16 mapped courses offered by BITS in the first two years + 23 courses offered by UB in the final two years); more than 50% of the UB degree requirements must be delivered by UB to comply with SUNY policy.
- Upon completion of all BITS Pilani Courses during Years 1 and 2 (including summer term, if any) at the BITS Campus, students will receive 48 credit points as a UB credit exemption (UB transfer credit) against the 16 mapped courses to complete the UB Degree in accordance with UB’s policies and procedures; not all BITS course transferred to UB will apply to UB degree requirements.



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 BIO F110: Biology Laboratory is a required course at BITS Pilani. It will be offered to meet the graduation requirements of BITS Pilani only.
②	Course BIO F111: General Biology is a required course at BITS Pilani. It will be offered to meet the graduation requirements of BITS Pilani. This course will satisfy a 100-Level Technical Elective (EAS 199 substitute) requirement at UB. (Students may be allowed to choose even other BITS courses (e.g., BITS F111, MATH F112, ME F315, ME F320, ME F221) to satisfy UB's 100-level requirement, but this course seems just as good as any other, and can be used consistently between programs).
③	Course CHEM F110: Chemistry Laboratory is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to CHE 113LAB: General Chemistry at UB, and an acceptable substitute for the CHE 127: General Chemistry for Engineers Laboratory 1 degree requirement at UB.
④	Course CHEM F111: General Chemistry is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to CHE 999 at UB, and an acceptable substitute for the CHE 107: General Chemistry for Engineers 1 degree requirement at UB.
⑤	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).
⑥	Course PHY F110: Physics Laboratory is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to PHY 151: Physics Lab 1 at UB. This course will not satisfy a degree requirement at UB.
⑦	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.
⑧	Course BITS F234: Introduction to Engineering Design is to be offered to BITS-UB students of BE Mechanical programme in place of BITS F110: Engineering Graphics. It will be considered as equivalent to EAS 999TR177/MAE 177: Engineering Drawing and CAD, a required course offered at UB.
⑨	Course ELI 105: Writing and Rhetoric is the required UB Curriculum 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 HSS F224 English Skills for Academic, 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 1 st Open Elective course out of 5 required at BITS.
⑩	Course MATH F112: Mathematics II is a required course at BITS Pilani. It will be offered to meet the graduation requirements of BITS Pilani only.
⑪	Course ME F112: Workshop Practice is a required course at BITS Pilani. It will be offered to meet the graduation requirements of BITS Pilani only.
⑫	Course BITS F111: Thermodynamics is a required course at BITS Pilani. It will be offered to meet the graduation requirements of BITS Pilani only.



⑬	Course BITS F235: Digital Fundamentals is to be offered to BITS-UB students of BE Mechanical programme in place of CS F111: Computer Programming. 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.
⑭	Course MATH F113: Probability and Statistics is a compulsory foundation course at BITS Pilani. It will be considered as equivalent to EAS 305 Applied Probability and Statistics. This course will satisfy the Applied Math Elective requirement at UB.
⑮	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.
⑯	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.
⑰	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).
⑱	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 HUEs. 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.
⑲	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.
⑳	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 courses offered at UB.
㉑	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.
㉒	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.
㉓	Course ME F320: Engineering Optimization is shifted from 3rd Year to Second Year to fulfill overall course requirement of BITS Pilani. This course will not satisfy a degree requirement at UB.
㉔	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.
㉕	Course EAS 360: STEM Communications is the required course offered at UB. It will be offered by UB through online mode. It will be considered as an equivalent to BITS F112: Technical Report Writing a required foundation course at BITS Pilani.
㉖	Course ECON F211 Principles of Economics OR MGTS F211: Principles of Managements is a required course at BITS Pilani. It will be offered to meet the graduation requirements of BITS Pilani only.
㉗	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.
㉘	Course ME F317: Engines, Motors, and Mobility is a required course at BITS Pilani. It will be offered to meet the graduation requirements of BITS Pilani only.
㉙	BITS F225: Environmental Studies is a required foundation course at BITS. It will be considered equivalent to EVS 118: Intro Environment and Sustainability Studies offered at UB. EVS 118: Intro Environment and Sustainability Studies also fulfills the requirement of a course at UB offered under Thematic Pathway category. Thus, it will fulfill the requirement of 1st course



	under Thematic Pathway (Environment Track) out of the total required 9 credits required under the Thematic Pathway category.
30	Course ME F221: Mechanisms and Machines is a required course at BITS Pilani. It will be offered to meet the graduation requirements of BITS Pilani only.
31	Course ME F315: Advanced Manufacturing Processes is a required course at BITS Pilani. It will be offered to meet the graduation requirements of BITS Pilani only.
32	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.
33	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.
34	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.
35	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.
36	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.
37	Course EAS 198: UB Seminar is a required course offered at UB. It will be offered to meet graduation requirements of UB only.
38	Course PHY 158: General Physics II Lab is the required course offered at UB. It will be offered to meet graduation requirements of UB only.
39	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.
40	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.
41	Course MAE 334: MAE Laboratory I is the required course offered at UB. Also, this will be considered as the 1 st Discipline course out of 4 required courses at BITS, either as a project type course or a new elective to be introduced.
42	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 21 above.
43	This course would be the new general Technical Elective. The general technical elective will include all 300/400-level course in SEAS, as well as select 3-credit courses in BIO, CHE, PHY, MTH, GEO, ECO, COM, and MGO. Also, this course will be considered as the 4 th Open Elective course out of 5 required at BITS.
44	An added requirement to the new mechanical engineering curriculum at UB Also, this course may be considered as the 5 th Open Elective course for BITS.
45	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.
46	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.
47	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.
48	This course would be the 2 nd MAE Technical Elective out of the total required 3 courses under



	<p>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.</p>
49	<p>This would be the 2nd Humanities Elective (HUEL) out of total required 3 HUEs. 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.</p>
50	<p>This would be the 3rd Humanities Elective (HUEL) out of total required 3 HUEs. 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.</p>
51	<p>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.</p>
52	<p>Course UBC 399: UB Curriculum Capstone is the required course offered at UB. It will be offered to meet graduation requirements of UB only.</p>
53	<p>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.</p>
54	<p>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.</p>
55	<p>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 for BITS.</p>



Schedule B – Credit Map detailing

Schedule B1: Credit Map details from the perspective of the BITS Pilani degree

BITS Pilani Credit Arrangements in Years 1 and 2 BITS Campus locations

Students are enrolled into BE Mechanical program at BITS Pilani and the BS Mechanical Engineering program at University at Buffalo (UB) during Years 1 and 2 of the program, completing the following courses. There will be 27 courses with 77 Units offered by BITS Pilani (during Year I and Year II to fulfill partial requirement of award of BITS Pilani Degree). These courses will be entirely taught by BITS with the number of delivery hours being determined by BITS.

S. No.	Course Code	Course Title	Unit
1	BIO F110	Biology laboratory	1
2	BIO F111	General Biology	3
3	CHEM F110	Chemistry Laboratory	1
4	CHEM F111	General Chemistry	3
5	PHY F110	Physics Laboratory	1
6	PHY F111	Mechanics, Oscillations and Waves	3
7	BITS F234	Introduction to Engineering Design	4
8	MATH F111	Mathematics I	3
9	MATH F112	Mathematics II	3
10	MATH F113	Probability & Statistics	3
11	MATH F211	Mathematics III	3
12	BITS F111	Thermodynamics	3
13	EEE F111	Electrical Sciences	3
14	BITS F235	Digital Fundamentals	4
15	ME F112	Workshop Practice	2
16	ME F211	Mechanics of Solids	3
17	ME F216	ME F216: Materials Science and Engineering	3
18	ME F217	Applied Thermodynamics	4
19	ME F320	Engineering Optimization	3
20	ME F218	Advanced Mechanics of Solids	3
21	ME F317	Engines, Motors, and Mobility	2
22	ME F219	Manufacturing Processes	4
23	ME F221	Mechanisms and Machines	3
24	ME F315	Advanced Manufacturing Processes	3
25	ECON F211/ MGTS F211	Principles of Economics/ Principles of Management	3
26	BITS F225	Environmental Studies	3
27	-	Humanities Elective	3
			77



BITS Pilani Credit Arrangements in Years 1 and 2 UB Campus locations (Online mode)

Students are enrolled into BE Mechanical program at BITS Pilani and the BS Mechanical Engineering program at University at Buffalo (UB) during Years 1 and 2 of the program, completing the following courses offered by UB in online mode. There will be 3 courses with 10 Units offered by UB (during Year I and Year II to fulfill partial requirement of award of BITS Pilani and UB Degree). These courses will be entirely taught by UB through online mode with the number of delivery hours being determined by UB.

S. No.	UB Courses			BITS Pilani Courses		
	Code	Course Title	Unit	Code	Course Title	Unit
1	ENG/ELI 105	Writing and Rhetoric	4	-	Open Elective	4
2	PHY 108	Physics 2	4	-	Open Elective	4
3	EAS 360	STEM Communications	3	BITS F112	Technical Report Writing	2
4	EAS 208	Dynamics	3			
		Total	14			10

Note: UB and BITS may agree to change the division of student contact hours between both parties, subject to Indian regulatory requirements and RMIT policy. Any changes must be agreed in writing between both parties.

BITS Pilani Credit Arrangements in Years 3 and 4 at University at Buffalo Campus locations

Upon successful completion of Years 1 and 2 of the program, students will relocate to the UB campus and transfer into the BITS-UB program plan. Students will have to be completed 59 credit points for 23 (=19+4) Courses at UB in Year 3 and 4 to fulfil UB requirements. Out of these 23 courses, 19 Courses with 59 credit points/units (listed below) offered by UB during 3rd & 4th Year would be considered for the requirement of BITS Pilani Degree.

S. No.	UB Courses			BITS Pilani Courses		
	Code	Course Title	Unit	Code	Course Title	Unit
1	MAE 277	Introduction to ME Practice	3	ME F316	Manufacturing Management	2
2	MAE 335	Fluid Mechanics	3	ME F212	Fluid Mechanics	3
3	MAE 340	Dynamic Systems	3	ME F319	Vibrations and Control	3
4	MAE 376	Applied Math for MAEs	3	-	3 rd Open Elective	3
5	MAE 451	Design Process & Method	3	BITS F456	Capstone Project I	4
6	MAE 494	Design Project	3	BITS F457	Capstone Project II	4
7	MAE 338	MAE Laboratory II	2	ME F341	Prime Movers & Fluid Machines	3
8	MAE 377	Product Design in a CAE Environment	3	ME F318	Computer Aided Design	3
9	MAE 467	Vibration and Shocks I MAE Technical Electives	3	-	2nd Discipline Elective	3
10		Thematic or Global Pathway category	3	-	2nd Humanities Elective	3
11		Thematic or Global Pathway category	3	-	3rd Humanities Elective	3
12	MAE 311	Machines & Mechanisms 1	3	ME F314	Design of Machine Elements	3
13	MAE 336	Heat Transfer (=ME F220 Heat Transfer at BITS)	3	ME F220	Heat Transfer	4
14	MAE 334	Mechanical & Aerospace Engg Laboratory I	2	-	3 rd Discipline Elective	3
15		General Technical Electives	3	-	4 th Open Elective	3



S. No.	UB Courses			BITS Pilani Courses		
	Code	Course Title	Unit	Code	Course Title	Unit
16		MAE Technical Electives	3		3rd Discipline Elective	3
17		MAE Technical Electives	3	-	4th Discipline Elective	3
18	MAE 341	Feedback Control Systems	3	-	5th Open Elective	3
19	Thematic or Global Pathway category (Diversity requirement)		3	-	6th Open Elective	3
		Total	55		Total	59

Schedule A2 – Credit Map detailing to be considered by UB

UB Credit Arrangements in Years 1 and 2 at BITS Campus locations

During Years 1 and 2, students enrolled in the BE Mechanical program at BITS Pilani and as prospective/non-matriculated students in the BS Mechanical Engineering program at University at Buffalo (UB) receive 14 credits from online courses delivered by UB and 48 credits taught at BITS. In addition, two math courses (8 credits in total) will be waived. Overall, a total of 62 credits from 20 courses (14 online UB and 48 BITS courses) earned from Years 1 and 2 count toward UB degree requirements, and 8 credits from two math courses that are required for UB degree will be waived.

Upon successful completion of Year 1 and Year 2 study at BITS Campus locations and subject to the issue of an US student visa by the relevant Authorities, students will be transferred to the UB Campus (BS Mechanical Engineering) and shall be waived following two courses by with 8 credit points by UB.

S. No.	Course Code	Course Title	Unit
1	MATH 141	College Calculus I	4
2	MATH 142	College Calculus 2	4
	Total		8

UB Credit Arrangements in Years 1 and 2 UB Campus locations (Online mode)

Students are enrolled into BE Mechanical program at BITS Pilani and the BS Mechanical Engineering program at University at Buffalo (UB) during Years 1 and 2 of the program, completing the following courses offered by UB in online mode. There will be 4 courses with 14 Units offered by UB (during Year I and Year II to fulfill partial requirement of award of BITS Pilani and UB Degree). These courses will be entirely taught by UB in online mode with the number of delivery hours being determined by UB.

S. No.	UB Courses			BITS Pilani Courses		
	Code	Course Title	Unit	Code	Course Title	Unit
1	*ELI 105	Writing and Rhetoric	4	-	Open Elective	4
2	PHY 108	Physics 2	4	-	Open Elective	4
3	EAS 360	STEM Communications	3	BITS F112	Technical Report Writing	2
4	EAS 208	Dynamics	3			
		Total	14			10

Note: UB and BITS may agree to change the division of student contact hours between both parties, subject to Indian regulatory requirements and RMIT policy. Any changes must be agreed in writing between both parties.

** To be eligible to enroll in ELI 105 students for whom English is not a first or dominant language (Placement determined by English Proficiency Test Type & Minimum Scores section of the admission brochure), must successfully complete ELI 100 with a "C" grade or higher.*



Upon successful completion of the Courses delivered at BITS Campus locations in Year 1 and Year 2, students will receive **48** Credit points transfer by the UB for the following **16** BITS mapped Courses in the first two years.

S. No.	UB			BITS Pilani		
	Code	Course Title	Unit	Code	Course Title	Unit
1	BIO 200	Evolutionary Biology (satisfies 100-level technical elective)	3	BIO F111	General Biology	3
2	CHE 113	General Chemistry for Engineers Laboratory I	0.5	CHEM F110	Chemistry Laboratory	1
3	CHE 999	Chemistry 1	3.5	CHEM F111	General Chemistry	3
4	PHY 107	General Physics 1	4	PHY F111	Mechanics, Oscillations and Waves	3
5	MAE 177	Engineering Drawing and CAD	1	BITS F234	Introduction to Engineering Design	4
6	MTH 241	Calculus 3	4	MATH F111	Mathematics I	3
7	EAS 305	Applied Probability and Statistics	3	MATH F113	Probability & Statistics	3
8	MTH 306	Differential Equations	4	MATH F211	Mathematics III	3
9	EE 202LR	Circuit Analysis	3	EEE F111	Electrical Sciences	3
10	CSE 115 / EAS 230	Engineering Computations	4	BITS F235	Digital Fundamentals	4
11	EAS 207	Statics	3	ME F211	Mechanics of Solids	3
12	MAE 381	Engineering Materials	3	ME F216	Materials Science and Engineering	3
13	MAE 204	Thermodynamics	3	ME F217	Applied Thermodynamics	4
14	EAS 209	Mechanics of Solids	3	ME F218	Advanced Mechanics of Solids	3
15	MAE 364	Manufacturing Processes	3	ME F219	Manufacturing Processes	4
16	EVS 118	Intro Environment and Sustainability Studies (Thematic or Global Pathway category)	3	BITS F225	Environmental Studies	3
		Total	49			50

Students enrolled into the 2+2 UBITS International Collaborative Programme are required to transfer to the UB Campus in USA to complete Year 3 and Year 4 program requirements. In order to progress to the University at Buffalo as part of the BITS-UB International Collaboration Programme, students should have at the end of their first two years a CGPA of at least 6.0, with no BITS course fulfilling a UB degree requirement having a grade below D (grade point 4.0) in such courses. In addition, students must receive passing grades (D grade or better) in courses completed via the UB online mode that serve as prerequisites for other UB degree requirements.

For more details of UB conditions, UB website may be referred.



UB Credit Arrangements in Years 3 and 4 at University at Buffalo Campus locations

Upon successful completion of Years 1 and 2 of the program, students will relocate to the UB campus and transfer into the BITS-UB program plan. Students will have to completed 59 credit points for 23 Courses at UB in Year 3 and 4 to fulfil BITS Pilani & UB requirements. These **23 Courses** with **59 credit points/units** (listed below) offered by UB during 3rd & 4th Year would be considered for the requirement of UB Degree. Also some of these courses would also be considered as the compulsory core courses requirement of BITS Degree.

S. No.	Code	Course Title	Unit
1	MAE 277	Introduction to ME Practice	3
2	MAE 335	Fluid Mechanics	3
3	MAE 340	Dynamic Systems	3
4	MAE 376	Applied Math for MAEs	3
5	EAS 198	UB Seminar	1
6	PHY158	General Physics II Lab	1
7	MAE 451	Design Process & Method	3
8	MAE 494	Design Project	3
9	MAE 338	MAE Laboratory II	2
10	MAE 377	Product Design in a CAE Environment	3
11	MAE 467	Vibration and Shocks I MAE Technical Electives	3
12		Thematic or Global Pathway category	3
13		Thematic or Global Pathway category	3
14	MAE 311	Machines & Mechanisms 1	3
15	MAE 336	Heat Transfer	3
16	MAE 334	Mechanical & Aerospace Engg Laboratory I	2
17	MAE 385	Engineering Materials Lab	1
18		MAE Technical Electives	3
19		MAE Technical Electives	3
20	UBC 399	UB Capstone	1
21		General Technical Electives	3
22	MAE 341	Feedback Control Systems	3
23		Thematic or Global Pathway category (Diversity requirement)	3
		Total	59