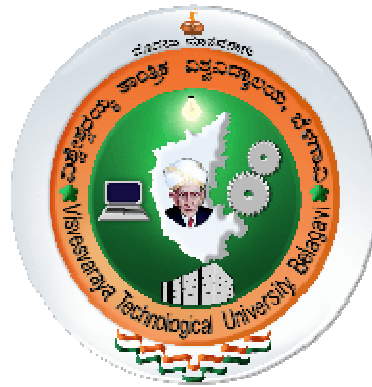


VISVESVARAYA TECHNOLOGICAL UNIVERSITY BELAGAVI



Scheme of Teaching and Examination and Syllabus

B.E. AEROSPACE ENGINEERING

III-VIII SEMESTER

(Effective from Academic year 2018-19)

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Scheme of Teaching and Examination 2018 – 19
Outcome Based Education(OBE) and Choice Based Credit System (CBCS)
B.E. AEROSPACE ENGINEERING
(Effective from the academic year 2018 – 19)

III SEMESTER

Sl. No	Course and Course Code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
1	BSC	18MAT31	Transform calculus Fourier series and numerical technique	Mathematics	2	2	--	03	40	60	100	3
2	PCC	18AS32/ 18AE32	Aero-Thermodynamics	AS	3	2	--	03	40	60	100	4
3	PCC	18AS33/ 18AE33	Mechanics of Materials	AS	3	2	--	03	40	60	100	4
4	PCC	18AS34	Introduction To Aerospace Engineering	AS	3	0	--	03	40	60	100	3
5	PCC	18AS35/ 18AE35	Mechanics of Fluids	AS	3	0	--	03	40	60	100	3
6	PCC	18AS36	Aerospace Materials	AS	3	0	--	03	40	60	100	3
7	PCC	18ASL37	Measurements and Metrology Lab	AS	--	2	2	03	40	60	100	2
8	PCC	18ASL38	Material Testing Lab	AS	--	2	2	03	40	60	100	2
9	HSMC	18KVK39/49	Vyavaharika Kannada (Kannada for communication)/	HSMC	--	2	--	--	100	--	100	1
		18KAK39/49	Aadalitha Kannada (Kannada for Administration)									
		OR										
		18CPC39	Constitution of India, Professional Ethics and Cyber Law									
TOTAL					17	10	04	24	420	480	900	25
					OR	OR		OR	OR	OR		
					18	12		26	360	540		

Note: BSC: Basic Science, PCC: Professional Core, HSMC: Humanity and Social Science, NCMC: Non-credit mandatory course.

18KVK39 Vyavaharika Kannada (Kannada for communication) is for non-Kannada speaking, reading and writing students and 18KAK39 Aadalitha Kannada (Kannada for Administration) is for students who speak, read and write Kannada.

Course prescribed to lateral entry Diploma holders admitted to III semester of Engineering programs

10	NCMC	18MATDIP31	Additional Mathematics - I	Mathematics	02	01	--	03	40	60	100	0
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(a)The mandatory non – credit courses Additional Mathematics I and II prescribed for III and IV semesters respectively, to the lateral entry Diploma holders admitted to III semester of BE/B. Tech programs, shall attend the classes during the respective semesters to complete all the formalities of the course and appear for the University examination. In case, any student fails to register for the said course/fails to secure the minimum 40 % of the prescribed CIE marks, he/she shall be deemed to have secured F grade. In such a case, the students have to fulfill the requirements during subsequent semester/s to appear for SEE.

(b)These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree.

Courses prescribed to lateral entry B. Sc degree holders admitted to III semester of Engineering programs

Lateral entrant students from B.Sc. Stream, shall clear the non-credit courses Engineering Graphics and Elements of Civil Engineering and Mechanics of the First Year Engineering Programme. These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree.

AICTE Activity Points to be earned by students admitted to BE/B. Tech/B. Plan day college programme (For more details refer to Chapter 6,AICTE Activity Point Programme, Model Internship Guidelines):

Over and above the academic grades, every Day College regular student admitted to the 4 years Degree programme and every student entering 4 years Degree programme through lateral entry, shall earn 100 and 75 Activity Points respectively for the award of degree through AICTE Activity Point Programme. Students transferred from other Universities to fifth semester are required to earn 50 Activity Points from the year of entry to VTU. The Activity Points earned shall be reflected on the student's eighth semester Grade Card.

The activities can be spread over the years, anytime during the semester weekends and holidays, as per the liking and convenience of the student from the year of entry to the programme. However, minimum hours' requirement should be fulfilled. Activity Points (non-credit) have no effect on SGPA/CGPA and shall not be considered for vertical progression.

In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be

admitted for the award of degree only after the release of the Eighth semester Grade Card.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI													
Scheme of Teaching and Examination 2018 – 19													
Outcome Based Education(OBE) and Choice Based Credit System (CBCS)													
B.E. AEROSPACE ENGINEERING													
(Effective from the academic year 2018 – 19)													
IV SEMESTER													
Sl. No.	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits	
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks		
					L	T	P						
1	BSC	18MAT41	Complex Analysis, Probability and statistical method	Mathematics	2	2	--	03	40	60	100	3	
2	PCC	18AS42/ 18AE42	Aerodynamics - I	AS	3	2	--	03	40	60	100	4	
3	PCC	18AS43	Aerospace Structures-I	AS	3	2	--	03	40	60	100	4	
4	PCC	18AS44/ 18AE44	Mechanisms And Machine Theory	AS	3	0	--	03	40	60	100	3	
5	PCC	18AS45	Introduction To Space Technology	AS	3	0	--	03	40	60	100	3	
6	PCC	18AS46	Composite Materials	AS	3	0	--	03	40	60	100	3	
7	PCC	18ASL47	Energy Conversion & Fluid Mechanics lab	AS	--	2	2	03	40	60	100	2	
8	PCC	18ASL48/ 18AEL48	Computer Aided Aircraft Drawing Lab	AS	--	2	2	03	40	60	100	2	
9	HSMC	18KVK39/49	Vyavaharika Kannada (Kannada for communication)/	HSMC	--	2	--	--	100	--	100	1	
		18KAK39/49	Aadalitha Kannada (Kannada for Administration)										
		OR											
		18CPC49	Constitution of India, Professional Ethics and Cyber Law		1	--	--	02	40	60			
TOTAL					17	10		24	420	480	900	25	
					OR	OR	04	OR	OR	OR			
					18	12		26	360	540			
Note: BSC: Basic Science, PCC: Professional Core, HSMC: Humanity and Social Science, NCMC: Non-credit mandatory course.													
18KVK39/49 Vyavaharika Kannada (Kannada for communication) is for non-Kannada speaking, reading and writing students and 18KAK39/49 Aadalitha Kannada (Kannada for Administration) is for students who speak, read and write Kannada.													
Course prescribed to lateral entry Diploma holders admitted to III semester of Engineering programs													
10	NCMC	18MATDIP41	Additional Mathematics – II	Mathematics	02	01	--	03	40	60	100	0	
(a)The mandatory non – credit courses Additional Mathematics I and II prescribed for III and IV semesters respectively, to the lateral entry Diploma holders admitted to III semester of BE/B. Tech programs, shall attend the classes during the respective semesters to complete all the formalities of the course and appear for the University examination. In case, any student fails to register for the said course/fails to secure the minimum 40 % of the prescribed CIE marks, he/she shall be deemed to have secured F grade. In such a case, the students have to fulfill the requirements during subsequent semester/s to appear for SEE.													
(b)These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree.													
Courses prescribed to lateral entry B. Sc degree holders admitted to III semester of Engineering programs													
Lateral entrant students from B.Sc. Stream, shall clear the non-credit courses Engineering Graphics and Elements of Civil Engineering and Mechanics of the First Year Engineering Programme. These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree.													
AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.													

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Scheme of Teaching and Examination 2018 – 19
Outcome Based Education(OBE) and Choice Based Credit System (CBCS)
B.E. AEROSPACE ENGINEERING
(Effective from the academic year 2018 – 19)

V SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination			Credits	
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks		Total Marks
					L	T	P					
1	PCC	18AS51/ 18AE51	Management and Entrepreneurship	AS	3	0	--	03	40	60	100	3
2	PCC	18AS52/ 18AE52	Aerodynamics - II	AS	3	2	--	03	40	60	100	4
3	PCC	18AS53	Aerospace Propulsion	AS	3	0	--	03	40	60	100	3
4	PCC	18AS54	Aerospace Structures –II	AS	3	--	--	03	40	60	100	3
5	PCC	18AS55/ 18AE55	Aircraft Systems & Instrumentation	AS	3	--	--	03	40	60	100	3
6	PCC	18AS56	Flight Mechanics	AS	3	--	--	03	40	60	100	3
7	PCC	18ASL57/ 18AEL57	Aerodynamics Lab	AS	--	2	2	03	40	60	100	2
8	PCC	18ASL58	Propulsion Lab	AS	--	2	2	03	40	60	100	2
9	HSMC	18CIV59	Environmental Studies	Civil/ Environmental	1	--	--	02	40	60	100	1
				[Paper setting: Civil Engineering Board]								
TOTAL					19	6	4	26	360	540	900	24

Note: PCC: Professional Core, HSMC: Humanity and Social Science.

AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Scheme of Teaching and Examination 2018 – 19
Outcome Based Education(OBE) and Choice Based Credit System (CBCS)
B.E. AEROSPACE ENGINEERING
(Effective from the academic year 2018 – 19)

VI SEMESTER												
Sl. No.	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination			Credits	
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks		Total Marks
					L	T	P					
1	PCC	18AS61	Missiles And Launch Vehicles	AS	3	2	--	03	40	60	100	4
2	PCC	18AS62	Computational Fluid Dynamics	AS	3	0	--	03	40	60	100	3
3	PCC	18AS63/ 18AE63	Finite Element Method	AS	3	0	--	03	40	60	100	3
4	PEC	18AS64X	Professional Elective -1	AS	3	--	--	03	40	60	100	3
5	OE	18AS65X	Open Elective -A	AS	3	--	--	03	40	60	100	3
6	PCC	18ASL66	Design, Modelling & Analysis Lab	AS	--	2	2	03	40	60	100	2
7	PCC	18ASL67	Aerospace Structures Lab	AS	--	2	2	03	40	60	100	2
8	MP	18ASMP68	Mini-project	AS	--	--	2	03	40	60	100	2
9	Internship	--	Internship	To be carried out during the vacation/s of VI and VII semesters and /or VII and VIII semesters.								
TOTAL					15	6	6	24	320	480	800	22

Note: PCC: Professional core, PEC: Professional Elective, OE: Open Elective, MP: Mini-project.

Professional Elective -1

Course code under 18XX64X	Course Title
18AS641	Hypersonics
18 AS 642	Theory of Vibrations
18 AS 643	Introduction To Astrophysics And Space Environment
18 AS 644	Radar and Microwave Engineering

Open Elective -A

Students can select any one of the open electives offered by other Departments except those that are offered by the parent Department (Please refer to the list of open electives under 18XX65X). Selection of an open elective shall not be allowed if,

- The candidate has studied the same course during the previous semesters of the programme.
- The syllabus content of open elective is similar to that of the Departmental core courses or professional electives.
- A similar course, under any category, is prescribed in the higher semesters of the programme.
- Registration to electives shall be documented under the guidance of Programme Coordinator/ Advisor/Mentor.

Mini-project work:

Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary Mini-project can be assigned to an individual student or to a group having not more than 4 students.

CIE procedure for Mini-project:

(i) Single discipline: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide.

The CIE marks awarded for the Mini-project work shall be based on the evaluation of project report, project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

(ii) Interdisciplinary: Continuous Internal Evaluation shall be group wise at the college level with the participation of all the guides of the college.

The CIE marks awarded for the Mini-project, shall be based on the evaluation of project report, project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

SEE for Mini-project: (i) Single discipline: Contribution to the Mini-project and the performance of each group member shall be assessed individually in the semester end examination (SEE) conducted at the department. **(ii) Interdisciplinary:** Contribution to the Mini-project and the performance of each group member shall be assessed individually in semester end examination (SEE) conducted separately at the departments to which the student/s belong to.

Internship: All the students admitted to III year of BE/B. Tech shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A University examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not take-up/complete the internship shall be declared fail and shall have to complete during subsequent University examination after satisfying the internship requirements.

AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Scheme of Teaching and Examination 2018 – 19
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B.E. AEROSPACE ENGINEERING
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VII SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination			Credits	
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks		Total Marks
					L	T	P					
1	PCC	18AS71	Space Mechanics	AS	3	--	--	03	40	60	100	3
2	PCC	18AS72	Control Engineering	AS	3	--	--	03	40	60	100	3
3	PEC	18AS73X	Professional Elective - 2	AS	3	--	--	03	40	60	100	3
4	PEC	18AS74X	Professional Elective - 3	AS	3	--	--	03	40	60	100	3
5	OEC	18AS75X	Open Elective -B	AS	3	--	--	03	40	60	100	3
6	PCC	18ASL76	Space Simulation Lab	AS	--	2	2	03	40	60	100	2
	PCC	18ASL77	Avionics & Instrumentation Lab	AS	--	2	2	03	40	60	100	2
7	Project	18XXP78	Project Work Phase - 1	AS	--	--	2	--	100	--	100	2
8	Internship	--	Internship	(If not completed during the vacation of VI and VII semesters, it shall be carried out during the vacation of VII and VIII semesters)								
TOTAL					15	4	4	18	340	360	700	21

Note: PCC: Professional core, PEC: Professional Elective.

Professional Elective - 2

Course code under 18XX73X

Course Title

18AS731	Avionics Systems
18 AS 732	Space Vehicle Design
18 AS 733	Air and Missile Defense Systems
18 AS734/18AE734	Heat & Mass Transfer

Professional Electives - 3

Course code under 18XX74X

Course Title

18AS741	Satellite Communication
18AS742/18AE742	Wind Tunnel Techniques
18AS743/18AE743	Guidance, Navigation & Control
18AS744	Global Navigation Satellite Systems

Open Elective -B

Students can select any one of the open electives offered by other Departments except those that are offered by the parent Department (Please refer to the list of open electives under 18XX75X).

Selection of an open elective shall not be allowed if,

- The candidate has studied the same course during the previous semesters of the programme.
- The syllabus content of open elective is similar to that of the Departmental core courses or professional electives.
- A similar course, under any category, is prescribed in the higher semesters of the programme.
- Registration to electives shall be documented under the guidance of Programme Coordinator/ Advisor/Mentor.

Project work:

Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary project can be assigned to an individual student or to a group having not more than 4 students. In extraordinary cases, like the funded projects requiring students from different disciplines, the project student strength can be 5 or 6.

CIE procedure for Project Work Phase - 1:

(i) **Single discipline:** The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide.

The CIE marks awarded for the project work phase -1, shall be based on the evaluation of the project work phase -1 Report (covering Literature Survey, Problem identification, Objectives and Methodology), project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the Project report shall be the same for all the batch mates.

(ii) **Interdisciplinary:** Continuous Internal Evaluation shall be group wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable.

The CIE marks awarded for the project work phase -1, shall be based on the evaluation of project work phase -1 Report (covering Literature Survey, Problem identification, Objectives and Methodology), project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

Internship: All the students admitted to III year of BE/B. Tech shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A University examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not take-up/complete the internship shall be declared fail and shall have to complete during subsequent University examination after satisfying the internship requirements.

AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Scheme of Teaching and Examination 2018 – 19
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B.E. AEROSPACE ENGINEERING
(Effective from the academic year 2018 – 19)

VIII SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P					
1	PCC	18AS81	Spacecraft Systems	AS	3	--	--	03	40	60	100	3
2	PEC	18 AS82X	Professional Elective - 4	AS	3	--	--	03	40	60	100	3
3	Project	18 ASP83	Project Work Phase - 2	AS	--	--	2	03	40	60	100	8
4	Seminar	18 ASS84	Technical Seminar	AS	--	--	2	03	100	--	100	1
5	Internship	18 ASI85	Internship	Completed during the vacation/s of VI and VII semesters and /or VII and VIII semesters.)				03	40	60	100	3
TOTAL					06	--	4	15	260	240	500	18

Note: PCC: Professional Core, PEC: Professional Elective.

Professional Electives – 4

Course code under 18XX82X	Course Title
18AS821	Satellite Navigation Systems
18AS822	Cryogenics
18AS823	Robotics
18AS824	Optimization Techniques

Project Work

CIE procedure for Project Work Phase - 2:

(i) Single discipline: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide.

The CIE marks awarded for the project work phase -2, shall be based on the evaluation of project work phase -2 Report, project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

(ii) Interdisciplinary: Continuous Internal Evaluation shall be group wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable.

The CIE marks awarded for the project work phase -2, shall be based on the evaluation of project work phase -2 Report, project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

SEE for Project Work Phase - 2:

(i) Single discipline: Contribution to the project and the performance of each group member shall be assessed individually in semester end examination (SEE) conducted at the department.

(ii) Interdisciplinary: Contribution to the project and the performance of each group member shall be assessed individually in semester end examination (SEE) conducted separately at the departments to which the student/s belong to.

Internship: Those, who have not pursued /completed the internship shall be declared as fail and have to complete during subsequent University examination after satisfying the internship requirements.

AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.

Activity points of the students who have earned the prescribed AICTE activity Points shall be sent the University along with the CIE marks of 8th semester. In case of students who have not satisfied the AICTE activity Points at the end of eighth semester, the column under activity Points shall be marked NSAP (Not Satisfied Activity Points).