

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY  
BELAGAVI**



**3<sup>rd</sup> to 8<sup>th</sup> Semester BE- INDUSTRIAL AND PRODUCTION ENGINEERING  
Scheme of Teaching and Examinations**

**Outcome Based Education (OBE) and Choice Based Credit System (CBCS)  
(Effective from the 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)**  
**(Effective from the academic year 2018 – 19)**

**III SEMESTER: INDUSTRIAL AND PRODUCTION ENGINEERING**

Sl. No	Course and Course Code		Course Title	Teaching Department	Teaching Hours/Week			Examination			Credits	
					Theory Lecture	Tutorial	Practical/ Drawing	Durations in hours	CIE Marks	SEE Marks		Total Marks
					L	T	P					
1	BSC	18MAT31	Transform Calculus, Fourier Series and Numerical Techniques	Mathematics	2	2	--	03	40	60	100	3
2	PCC	18IP32	Mechanics of Materials	IPE/MECH	3	2	--	03	40	60	100	4
3	PCC	18IP33	Basic Thermodynamics		2	2	--	03	40	60	100	3
4	PCC	18IP34	Mechanical Measurements		2	2	--	03	40	60	100	3
5	PCC	18IP35	Fluid Mechanics		2	2	--	03	40	60	100	3
6	PCC	18IP36	Manufacturing Process -1		2	2	--	03	40	60	100	3
7	PCC	18IPL37	Foundry and Forging Laboratory		--	2	2	03	40	60	100	2
8	PCC	18IPL38	Metrology and Measurements Laboratory		--	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							
		18CPC39/49	Constitution of India, Professional Ethics and Cyber Law		1	--	--	02	40	60	100	
		Total			Examination is by objective type questions							
					<b>13</b>	<b>16</b>	<b>04</b>	<b>24</b>	<b>420</b>	<b>480</b>	<b>900</b>	<b>24</b>
					<b>OR</b>	<b>OR</b>		<b>OR</b>	<b>OR</b>	<b>OR</b>		
					<b>14</b>	<b>18</b>		<b>26</b>	<b>360</b>	<b>540</b>		

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

18KVK39Vyavaharika 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
----	------	------------	----------------------------	-------------	----	----	----	----	----	----	-----	---

(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)**  
**(Effective from the academic year 2018 – 19)**

**IV SEMESTER: INDUSTRIAL AND PRODUCTION ENGINEERING**

Sl. No	Course and Course Code		Course Title	Teaching Department	Teaching Hours/Week			Examination				Credits	
					Theory Lecture	Tutorial	Practical/ Drawing	Durations in hours	CIE Marks	SEE Marks	Total Marks		
					L	T	P						
1	BSC	18MAT41	Complex Analysis, Probability and Statistical Methods	Mathematics	2	2	--	03	40	60	100	3	
2	PCC	18IP42	Computer Aided Machine Drawing	IPE/MECH	2	-	4	03	40	60	100	4	
3	PCC	18IP43	Kinematics of Machines		2	2	--	03	40	60	100	3	
4	PCC	18IP44	Manufacturing Process- II		2	2	--	03	40	60	100	3	
5	PCC	18IP45	Material Science and Metallurgy		2	2	--	03	40	60	100	3	
6	PCC	18IP46	CAD/CAM		2	2	--	03	40	60	100	3	
7	PCC	18IPL47	Machine Shop		--	2	2	03	40	60	100	2	
8	PCC	18IPL48	Metallography and Material Testing Laboratory		--	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								
		18CPC39/49	Constitution of India, Professional Ethics and Cyber Law		1	--	--	02	40	60	100		
		Total			Examination is by objective type questions								
		12			14	08	24	420	480	900	24		
OR		OR	OR	OR	OR								
13		16	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 IV 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)**  
**(Effective from the academic year 2018 – 19)**

**V SEMESTER: INDUSTRIAL AND PRODUCTION ENGINEERING**

Sl. No	Course and Course Code		Course Title	Teaching Department	Teaching Hours/Week			Examination			Credits	
					Theory Lecture	Tutorial	Practical/ Drawing	Durations in hours	CIE Marks	SEE Marks		Total Marks
					L	T	P					
1	PCC	18IP51	Management and Entrepreneurship	IPE/MECH	2	2	--	03	40	60	100	3
2	PCC	18IP52	Design of Machines Elements		3	2	--	03	40	60	100	4
3	PCC	18IP53	Quality Assurance and Reliability		3	2	--	03	40	60	100	4
4	PCC	18IP54	Hydraulics and Pneumatics		2	2	--	03	40	60	100	3
5	PCC	18IP55	Work Study and Ergonomics		2	2	--	03	40	60	100	3
6	PCC	18IP56	Composite Materials		2	2	--	03	40	60	100	3
7	PCC	18IPL57	Mechanical and Fluid Power Lab		--	2	2	03	40	60	100	2
8	PCC	18IPL58	Work study and Ergonomics Lab		--	2	2	03	40	60	100	2
9	HSMC	18CIV59	Environmental Studies	Civil/ Environmental [Paper setting: Civil Engineering Board]	1	--	--	02	40	60	100	1
<b>Total</b>					<b>15</b>	<b>16</b>	<b>04</b>	<b>26</b>	<b>360</b>	<b>540</b>	<b>900</b>	<b>25</b>

**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)**  
**(Effective from the academic year 2018 – 19)**

**VI SEMESTER: INDUSTRIAL AND PRODUCTION ENGINEERING**

Sl. No	Course and Course Code		Course Title	Teaching Department	Teaching Hours/Week			Examination				
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
					L	T	P					
1	PCC	18IP61	Computer Integrated Manufacturing	IPE/MECH	3	2	--	03	40	60	100	4
2	PCC	18IP62	Operations Research		3	2	--	03	40	60	100	4
3	PCC	18IP63	Tool Engineering and Design		3	2	--	03	40	60	100	4
4	PEC	18IP64X	Professional Elective - 1		2	2	--	03	40	60	100	3
5	OEC	18XX65X	Open Elective -A	IPE/MECH	2	2	--	03	40	60	100	3
6	PCC	18IP66	CAD/CAM Lab		--	2	2	03	40	60	100	2
7	PCC	18IPL67	Machine Tool Lab		--	2	2	03	40	60	100	2
8	MP	18IPMP68	Mini-Project		--	--	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.								
<b>Total</b>					<b>16</b>	<b>08</b>	<b>06</b>	<b>24</b>	<b>320</b>	<b>480</b>	<b>800</b>	<b>24</b>

**Note:** PCC: Professional Core, PEC: Professional Elective, OEC: Open Elective

**Professional Elective - 1**

Course code under 18IP64X	Course Title
18IP641	Theory of Metal Forming
18IP642	Engineering Economy
18IP643	Total Quality Management

**Open Elective –A**

18IP651	Value Engineering
18IP652	Advanced Machining Process
18IP653	Management Information Systems

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 belongs 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**  
**Outcome Based Education(OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2018 – 19)**

**VII SEMESTER: INDUSTRIAL AND PRODUCTION ENGINEERING**

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	18IP71	Operations Management	IPE/MECH	2	2	--	03	40	60	100	3
2	PCC	18IP72	Mechatronics		2	2	--	03	40	60	100	3
3	PEC	18IP73X	Professional Elective - 2		2	2	--	03	40	60	100	3
4	PEC	18IP74X	Professional Elective - 3		2	2	--	03	40	60	100	3
5	OEC	18XX75X	Open Elective -B	IPE/MECH	2	2	--	03	40	60	100	3
6	PCC	18IPL76	Software Applications Lab		--	2	2	03	40	60	100	2
7	PCC	18IPL77	CNC and Robotics Lab		--	2	2	03	40	60	100	2
8	Project	18IPP78	Project Work Phase – 1		--	--	2	--	100	--	100	1
9	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								
<b>Total</b>					<b>10</b>	<b>14</b>	<b>06</b>	<b>21</b>	<b>380</b>	<b>420</b>	<b>800</b>	<b>20</b>

**Note:** PCC: Professional Core, PEC: Professional Elective, OEC: Open Elective

**Professional Elective -2**

Course code under 18IP73X	Course Title
18IP731	Marketing Management
18IP732	Automobile Engineering
18IP733	Human Resource Management

**Professional Elective -3**

Course code under 18IP74X	Course Title
18IP741	Non-Conventional Machining Processes
18IP742	Design of Experiments
18IP743	Just In Time Manufacturing

**Open Elective -B**

18IP751	Project Management
18IP752	Automotive Engineering
18IP753	Enterprise Resource Planning

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.

**Project work:**

Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multi-disciplinary 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 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 belongs 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**  
**Outcome Based Education(OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2018 – 19)**

**VIII SEMESTER: INDUSTRIAL AND PRODUCTION ENGINEERING**

Sl. No	Course and Course Code		Course Title	Teaching Department	Teaching Hours/Week			Examination			Credits	
					Theory Lecture	Tutorial	Practical/ Drawing	Durations in hours	CIE Marks	SEE Marks		Total Marks
					L	T	P					
1	PCC	18IP81	Supply Chain Management	IPE/MECH	2	2	--	03	40	60	100	3
2	PEC	18IP82X	Professional Elective-4		2	2	--	03	40	60	100	3
3	Project	18IPP83	Project Phase -2		--	--	2	03	40	60	100	8
4	Seminar	18IPS84	Technical Seminar		--	--	2	03	100	--	100	1
4	Internship	18IPI85	Internship		Completed during the vacation/s of VI and VII semesters and /or VII and VIII semesters.)			03	40	60	100	3
<b>Total</b>					<b>04</b>	<b>04</b>	<b>04</b>	<b>15</b>	<b>260</b>	<b>240</b>	<b>500</b>	<b>18</b>

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

**Professional Elective -4**

Course code under 18IP64X	Course Title
18IP821	Advanced Joining Process and NDT
18IP822	Facility Planning and Design
18IP823	Automation in Manufacturing

**Project Work:**

**CIE procedure for Project 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 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 Project Phase -2:**

**(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 belongs 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.

Activity points of the students who have earned the prescribed AICTE activity Points shall be sent the University along with the CIE marks of 8<sup>th</sup> 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).