Department of Electrical and Electrical Engineering
Scheme of UG Autonomous Program – 2023 batch
(3rd Semester)

III SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Dept.	Teaching Hours/Week			Examination			CREDITS
						L	T	P	CIE	SEE	Total	
1	MAT23301D	Transforms and Complex Variables	BS	MAT		2	2	0	50	50	100	3
2	EEE23302	Electrical Machines-I (Integrated)	IPC	EEE	EEE	3	0	2	50	50	100	4
3	EEE23303	Analog Electronic Circuits (Integrated)	IPC			3	0	2	50	50	100	4
4	EEE23304	Electric Circuits	PC			2	2	0	50	50	100	3
5	EEE23305X	ESC/ETC/PLC	ESC/ETC/PLC			3	0	0	50	50	100	3
6	SCK23306	**Social Connect and Responsibility**	Any Department			0	0	2	100	---	100	1
7	EEE23307X	Ability Enhancement Course – I (Theory)	AEC			2	0	0	50	50	100	2
		OR				OR						
		Ability Enhancement Course – I (Integrated)	AEC			1	0	2	50	50	100	2
8	NSK23308	National Service Scheme (NSS)	MC	NSS coordinator		0	0	2	100	---	100	0
	PEK23308	Physical Education (PE) (Sports and Athletics)		Physical Education Director								
	YOK23308	Yoga		Yoga Teacher								
								Total	500	300	800	20

ESC/ETC/PLC			
EEE233051	Digital Logic Design	EEE233052	Electrical Measurements and Instrumentation
Ability Enhancement Course – I			
EEE233071	Sensor Systems	EEE233073	SCI LAB/MATLAB for Transformers and Generators
EEE233072	Physics of Electronic Devices	EEE233074	555 IC Laboratory

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Department of Electrical and Electrical Engineering
Scheme of UG Autonomous Program – 2023 batch
(4th Semester)

IV SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Dept.	Teaching Hours/Week			Examination			CREDITS
						L	T	P	CIE	SEE	Total	
1	MAT23401D	Probability, Special Functions and Advanced Linear Algebra	BS	MAT		3	0	0	50	50	100	3
2	EEE23402	Electrical Machines-II (Integrated)	IPC	Respective Department ****Common courses across departments should have common course code and title. There should be one PSB		3	0	2	50	50	100	4
3	EEE23403	Control Systems (Integrated)	IPC			3	0	2	50	50	100	4
4	EEE23404	Power System –I	PC			2	2	0	50	50	100	3
5	EEE23405X	ESC/ETC/PLC	ESC/ETC/PLC			3	0	0	50	50	100	3
6	UHK23406	Universal Human Values Courses	Any Department			0	0	2	50	—	50	1
7	EEE23407X	Ability Enhancement Course – I (Theory) Sensor Systems	AEC			2	0	0	50	50	100	2
		OR				OR						
		Ability Enhancement Course – II (Integrated)	AEC			1	0	2	50	50	100	2
8	NSK23408	National Service Scheme (NSS)	MC	NSS coordinator		0	0	2	100	—	100	0
	PEK23408	Physical Education (PE) (Sports and Athletics)		Physical Education Director								
	YOK23408	Yoga		Yoga Teacher								
						Total			500	300	800	20

ESC/ETC/PLC			
EEE234051	Signal and Systems	EEE234053	Computer Organization and Architecture
EEE234052	Micro-Electro-Mechanical Systems [MEMS]		
Ability Enhancement Course – II			
EEE234071	Engineering Materials	EEE234073	PCB Design Laboratory
EEE234072	Data Structures using C		

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Scheme and Syllabus of
UG Autonomous Program – 2023 batch
V SEMESTER

Global Academy of Technology

(An Autonomous Institution, affiliated to VTU, Belagavi, recognized by Karnataka and Approved by AICTE, New Delhi.)

B.E. in Electrical & Electronics Engineering Scheme of Teaching and Examinations 2023

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the academic year 2023-24)

Sl. No	Course and Course Code		Course Title	Teaching Department (TD)and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Self -Study	Duration inhours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	HSMS	EEE23501	Management & Economics	TD: EEE PSB:EEE	3	0	0		03	50	50	100	3
2	IPCC	EEE 23502	Power Electronics	TD:EEE PSB:EEE	3	0	2		03	50	50	100	4
3	PCC	EEE23503	Power Systems II	TD: EEE PSB:EEE	3	2	0		03	50	50	100	4
4	PCCL	EEEL23504	Auto CAD	TD: EEE PSB:EEE	0	0	2		03	50	50	100	1
5	PEC	EEE23505X	Professional Elective - I	TD: EEE PSB:EEE	3	0	0		03	50	50	100	3
6	PROJ	EEEP23506	Mini Project	TD: EEE PSB:EEE	0	0	4		03	100		100	2
7	AEC	RIMK23507	Research Methodology and IPR	Any Department	2	2	0		03	50	50	100	3
8	MC	EEEK23508	Environmental Studies	TD: CV/Env/Chem PSB:CV	2	0	0		02	50	50	100	2
9	MC	NSK23509	National Service Scheme (NSS)	NSS coordinator	0	0	2			100		100	0
		PEK23509	Physical Education (PE) (Sports and Athletics)	Physical Education Director									
		YOK23509	Yoga	Yoga Teacher									
									Total	500	300	800	22

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Professional Elective Course - I			
EEE23505A	Object Oriented Programming Using C++	EEE23505C	Digital System Design Using Verilog HDL
EEE23505B	Embedded Systems	EEE23505D	Electromagnetic Field Theory

PCC: Professional Core Course, **PCCL:** Professional Core Course laboratory, **UHV:** Universal Human Value Course, **MC:** Mandatory Course (Non-credit), **AEC:** Ability Enhancement Course, **SEC:** Skill Enhancement Course, **L:** Lecture, **T:** Tutorial, **P:** Practical **S= SDA:** Skill Development Activity, **CIE:** Continuous Internal Evaluation, **SEE:** Semester End Evaluation. **K :** The letter in the course code indicates common to al the stream of engineering. **PROJ:** Project /Mini Project. **PEC:** Professional Elective Course.

Professional Core Course (IPCC): Refers to Professional Core Course Theory Integrated with practical of the same course. Credit for IPCC can be 04 and its Teaching– Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by only CIE (no SEE). However, questions from the practical part of IPCC shall be included in the SEE question paper. For more details, the regulation governing the Degree of Bachelor of Engineering /Technology (B.E./B.Tech.) 2022-23

National Service Scheme /Physical Education/Yoga: All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE) (Sports and Athletics), and Yoga (YOG) with the concerned coordinator of the course during the first week of III semesters. Activities shall be carried out between III semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall
not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the course is mandatory for the award of degree.

Mini-project work: Mini Project is a laboratory-oriented/hands on course that will provide a platform to students to enhance their practical knowledge and skills by the development of small systems/applications etc. 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 faculty members of the Department, one of them being the Guide. The CIE marks awarded for the Mini-project work shall be based on the evaluation of the project report, project presentation skill, and question and answer session in the ratio of 50:25:25. The marks awarded for the project report shall be the same for all the batches mates.

(ii) Interdisciplinary: Continuous Internal Evaluation shall be group-wise at the college level with the participation of all the guides of the project.
The CIE marks awarded for the Mini project, shall be based on the evaluation of the 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 batchmates.

No SEE component for Mini-Project.

Professional Elective Courses (PEC): A professional elective (PEC) course is intended to enhance the depth and breadth of educational experience in the Engineering and Technology curriculum. Multidisciplinary courses that are added supplement the latest trend and advanced technology in the selected stream of engineering. Each group will provide an option to select one course. The minimum number of students' strengths for offering a professional elective is 10. However, this conditional shall
not be applicable to cases where the admission to the program is less than 10.

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Scheme and Syllabus of
UG Autonomous Program – 2023 batch
VI SEMESTER

Global Academy of Technology

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B.E. in Electrical & Electronics Engineering Scheme of Teaching and Examinations 2023

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the academic year 2023-24)

VI SEMESTER

Sl. No	Course and Course Code		Course Title	Teaching Department (TD)and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Self-Study	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	IPCC	EEE23601	Internet of Things and its Applications	TD:EEE PSB: EEE	3	0	2		03	50	50	100	4
2	PCC	EEE23602	Power Systems III	TD:EEE PSB: EEE	3	2	0		03	50	50	100	4
3	PEC	EEE23603X	Professional Elective - II	TD:EEE PSB: EEE	3	0	0		03	50	50	100	3
4	OEC	EEE23604X	Open Elective -I	TD:EEE PSB: EEE	3	0	0		03	50	50	100	3
5	PROJ	EEEP23605	Major Project Phase - I	TD:EEE PSB: EEE	0	0	4		03	100	--	100	2
6	PCCL	EEEL23606	Design lab Power System Simulation Lab	TD:EEE PSB: EEE	0	0	2		03	50	50	100	1
7	AEC/ SDC	EEE23607X	Ability Enhancement Course/ SkillDevelopment Course - III	TD & PSB: EEE	If the course is offered as a Theory: 1	0	0		01	50	50	100	1
					If course is offered as a practical: 0	0	2						
8	MC	NSK23608	National Service Scheme (NSS)	NSS coordinator	0	0	2			100	---	100	0
		PEK23608	Physical Education (PE) (Sports and Athletics)	Physical Education Director									
		YOK23608	Yoga	Yoga Teacher									
9	IKS	IKSK23609	Indian Knowledge System		1	0	0		01	100	0	100	0
									Total	500	300	800	18

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Professional Elective Course			
EEE23603A	Artificial Intelligence	EEE23603C	VLSI Design
EEE23603B	Micro grids	EEE23603D	Industrial Drives and its Applications
Open Elective Course			
EEE23604A	Electric Vehicles	EEE23604C	Utilization of Electrical Power
EEE23604B	Industrial Automation	EEE23604D	Technologies of Renewable Energy Sources
Ability Enhancement Course / Skill Enhancement Course - III			
EEE23607A	Embedded Systems Lab	EEE23607C	Energy Audit Project
EEE23607B	Simulation and Control of Power Electronics Circuits	EEE23607D	Project on Renewable Energy Sources

PCC: Professional Core Course, **PCCL:** Professional Core Course laboratory, **UHV:** Universal Human Value Course, **MC:** Mandatory Course (Non-credit), **AEC:** Ability Enhancement Course, **SEC:** Skill Enhancement Course, **L:** Lecture, **T:** Tutorial, **P:** Practical **S= SDA:** Skill Development Activity, **CIE:** Continuous Internal Evaluation, **SEE:** Semester End Evaluation. **K :** The letter in the course code indicates common to all the stream of engineering. **PROJ:** Project /Mini Project. **PEC:** Professional Elective Course. **PROJ:** Project Phase -I, **OEC:** Open Elective Course

Professional Core Course (IPCC): Refers to Professional Core Course Theory Integrated with practical of the same course. Credit for IPCC can be 04 and its Teaching–Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by only CIE (no SEE). However, questions from the practical part of IPCC shall be included in the SEE question paper. For more details, the regulationgoverning the Degree of Bachelor of Engineering /Technology (B.E./B.Tech.) 2022-23

National Service Scheme /Physical Education/Yoga: All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE)(Sports and Athletics), and Yoga(YOG) with the concerned coordinator of the course during the first week of III semesters. Activities shall be carried out between III semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the course is mandatory for the award of degree.

Professional Elective Courses (PEC): A professional elective (PEC) course is intended to enhance the depth and breadth of educational experience in the Engineering and Technology curriculum. Multidisciplinary courses that are added supplement the latest trend and advanced technology in the selected stream of engineering. Each group will provide an option to select one course. The minimum number of students' strengths for offering professional electives is 10. However, this conditional shall not be applicable to cases where the admission to the program is less than 10.

Open Elective Courses:

Students belonging to a particular stream of Engineering and Technology are not entitled to the open electives offered by their parent Department. However, they can opt for an elective offered by other Departments, provided they satisfy the prerequisite condition if any. Registration to open electives shall be documented under the guidance of the Program Coordinator/ Advisor/Mentor. The minimum numbers of students' strength for offering Open Elective Course is 10. However, this condition shall not be applicable to class where the admission to the program is less than 10.

Project Phase-I: Students have to discuss with the mentor /guide and with their help he/she has to complete the literature survey and prepare the report and finally define the problem statement for the project work.

Scheme and Syllabus of
UG Autonomous Program – 2023 batch

VII SEMESTER

Global Academy of Technology

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B.E. in Electrical & Electronics Engineering Scheme of Teaching and Examinations 2023

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the academic year 2023-24)

Scheme A- VII SEMESTER (Swappable VII and VIII SEMESTER)

Sl. No	Course and Course Code		Course Title	Teaching Department (TD)and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Self-Study	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	IPCC	EEE23701	Power Systems IV	TD:PSB:EEE	3	0	2		03	50	50	100	4
2	IPCC	EEE23702	Electric Vehicles	TD: PSB:EEE	3	0	2		03	50	50	100	4
3	PCC	EEE23703	Digital Signal Processing	TD: PSB:EEE	3	2	0		03	50	50	100	4
4	PEC	EEE23704x	Professional Elective-III	TD: PSB:EEE	3	0	0		03	50	50	100	3
5	OEC	EEE23705x	Open Elective- II	TD: PSB:EEE	3	0	0		03	50	50	100	3
6	PROJ	EEEP23706	Major Project Phase-II	TD: PSB:EEE	0	0	12		03	100	100	200	6
									Total	**400**	**300**	**700**	**24**

Professional Elective Course

EEE23704A	Machine Learning	EEE23704C	Switched Mode Power Converters
EEE23704B	Robotics and Automation	EEE23704D	FACTS & HVDC

Open Elective Course

EEE23705A	Smart Grid Technology	EEE23705C	Smart Internet of Things
EEE23705B	Electrical Energy Conservation and Auditing	EEE23705D	Energy Storage System

PCC: Professional Core Course, **PCCL:** Professional Core Course laboratory, **PEC:** Professional Elective Course, **OEC:** Open Elective Course PR: Project Work, **L:** Lecture, **T:** Tutorial, **P:** Practical **S= SDA:** Skill Development Activity, **CIE:** Continuous Internal Evaluation, **SEE:** Semester End Evaluation. **TD-** Teaching Department, **PSB:** Paper Setting department, **OEC:** Open Elective Course, **PEC:** Professional Elective Course. **PROJ:** Project work

Note: VII and VIII semesters of IV years of the program

(1) Institutions can swap the VII and VIII Semester Schemes of Teaching and Examinations to accommodate research internships/ industry internships after the VI

semester.

(2) Credits earned for the courses of VII and VIII Semester Scheme of Teaching and Examinations shall be counted against the corresponding semesters whether the VII or VIII semesters is completed during the beginning of the IV year or the later part of IV years of the program.

Professional Elective Courses (PEC): A professional elective (PEC) course is intended to enhance the depth and breadth of educational experience in the Engineering and Technology curriculum. Multidisciplinary courses that are added supplement the latest trend and advanced technology in the selected stream of engineering. Each group will provide an option to select one course. The minimum number of students' strengths for offering professional electives is 10. However, this conditional shall not be applicable to cases where the admission to the program is less than 10.

Open Elective Courses:

Students belonging to a particular stream of Engineering and Technology are not entitled to the open electives offered by their parent Department. However, they can opt for an elective offered by other Departments, provided they satisfy the prerequisite condition if any. Registration to open electives shall be documented under the guidance of the Program Coordinator/ Advisor/Mentor. The minimum numbers of students' strength for offering Open Elective Course is 10. However, this condition shall not be applicable to class where the admission to the program is less than 10.

PROJECT WORK (21MEP75): The objective of the Project work is

(i) To encourage independent learning and the innovative attitude of the students.
(ii) To develop interactive attitude, communication skills, organization, time management, and presentation skills.
(iii) To impart flexibility and adaptability.
(iv) To inspire team working.
(v) To expand intellectual capacity, credibility, judgment and intuition.
(vi) To adhere to punctuality, setting and meeting deadlines.
(vii) To install responsibilities to oneself and others.
(viii) To train students to present the topic of project work in a seminar without any fear, face the audience confidently, enhance communication skills, involve ingroup discussion to present and exchange ideas.

CIE procedure for Project Work:

(1) 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, shall be based on the evaluation of the project work 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.

(2) 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, shall be based on the evaluation of project work 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 procedure for Project Work: SEE for project work will be conducted by the two examiners appointed by the University. The SEE marks awarded for the project work shall be based on the evaluation of project work Report, project presentation skill, and question and answer session in the ratio 50:25:25.

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Scheme and Syllabus of
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VIII SEMESTER

Global Academy of Technology

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Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the academic year 2023-24)

Scheme A- VIII SEMESTER (Swappable VII and VIII SEMESTER)

Sl. No	Course and Course Code		Course Title	Teaching Department (TD)and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
					Theory	Tutorial	Practical / Drawin	Self-Study	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	PEC	EEE23801x	Professional Elective -IV (Online Courses)	TD:EEE PSB:EEE	3	0	0		03	50	50	100	3
2	OEC	EEE23802x	Open Elective - III (Online Courses)	TD:EEE PSB:EEE	3	0	0		03	50	50	100	3
3	INT	EEEI23803	Internship (Industry/Research) (14 - 20 weeks)	TD:EEE	0	0	12		03	100	100	200	10
Total										**200**	**200**	**400**	**16**

Professional Elective Course

EEE23801A	Smart Grid	EEE23801C	Image processing
EEE23801B	Electrical Power Quality	EEE23801D	Energy Conservation & Auditing

Open Elective Courses (Online Courses)

EEE23802A	MOOCs (Online)	EEE23802C	MOOCs (Online)
EEE23802B	MOOCs (Online)	EEE23802D	MOOCs (Online)

L: Lecture, **T:** Tutorial, **P:** Practical **S= SDA:** Skill Development Activity, **CIE:** Continuous Internal Evaluation, **SEE:** Semester End Evaluation. **TD-** Teaching Department, **PSB:** Paper Setting department, **OEC:** Open Elective Course, **PEC:** Professional Elective Course. **PROJ:** Project work, **INT:** Industry Internship / Research Internship / Rural Internship

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Note: VII and VIII semesters of IV years of the program

Swapping Facility

- **Institutions can swap VII and VIII Semester Scheme of Teaching and Examinations to accommodate research internships/ industry internships/Rural Internship after the VI semester.**
- **Credits earned for the courses of VII and VIII Semester Scheme of Teaching and Examinations shall be counted against the corresponding semesters whether VII or VIII semester is completed during the beginning of IV year or later part of IV year of the program.**

Elucidation:

At the beginning of IV years of the program i.e., after VI semester, VII semester classwork and VIII semester Research Internship /Industrial Internship / Rural Internshipshall be permitted to be operated simultaneously by the University so that students have ample opportunity for an internship. In other words, a good percentage of the class shall attend VII semester classwork and a similar percentage of others shall attend to Research Internship or Industrial Internship or Rural Internship.

Research/Industrial /Rural Internship shall be carried out at an Industry, NGO, MSME, Innovation centre, Incubation centre, Start-up, centre of Excellence (CoE), Study Centre established in the parent institute and /or at reputed research organizations/institutes.

The mandatory Research internship /Industry internship / Rural Internship is for 14 to 20 weeks. The internship shall be considered as a head of passing and shall be considered for the award of a degree. Those, who do not take up/complete the internship shall be declared to fail and shall have to complete it during the subsequent University examination after satisfying the internship requirements.

Research internship: A research internship is intended to offer the flavour of current research going on in the research field. It helps students get familiarized with the field and imparts the skill required for carrying out research.

Industry internship: Is an extended period of work experience undertaken by students to supplement their degree for professional development. It also helps them learn to overcome unexpected obstacles and successfully navigate organizations, perspectives, and cultures. Dealing with contingencies helps students recognize, appreciate, and adapt to organizational realities by tempering their knowledge with practical constraints.

Rural Internship: Rural development internship is an initiative of Unnat Bharat Abhiyan Cell, RGIT in association with AICTE to involve students of all departments studying in different academic years for exploring various opportunities in techno-social fields, to connect and work with Rural India for their upliftment.

The faculty coordinator or mentor has to monitor the student's internship progress and interact with them to guide for the successful completion of the internship.The students are permitted to carry out the internship anywhere in India or abroad. University shall not bear any expenses incurred in respect of the internship.

With the consent of the internal guide and Principal of the Institution, students shall be allowed to carry out the internship at their hometown (within or outside the state or abroad), provided favorable facilities are available for the internship and the student remains regularly in contact with the internal guide. University shall not bear any cost involved in carrying out the internship by students. However, students can receive any financial assistance extended by the organization.

Professional Elective /Open Elective Course:These are ONLINE courses suggested by the respective Board of Studies. Details of these courses shall be made available for students on the VTU web portal.

List of MOOCs Courses	
Cyber Security and Privacy	Data Science for Engineers
Sustainable Transportation System	Introduction to Deep Learning
Cloud Computing	Fabrication Techniques for MEMs based sensors
Programming in Java	Introduction to Biomedical Imaging Systems
Enclosure Design of electronics Equipment	Introduction to Industry 4.0 and Industrial Internet of Things
Introduction to Aerospace Engineering	Data Science Using Python