I & II Semester
Scheme & Syllabus
(2021 Scheme)

SCHEME AND SYLLABUS

Common to all branches

GLOBAL ACADEMY OF TECHNOLOGY
Autonomous institution affiliated to VTU, Belagavi.
Raja Rajeshwari Nagar, Bengaluru-560098.

GLOBAL ACADEMY OF TECHNOLOGY (Autonomous Institution Under VTU)

Scheme of Teaching and Examination 2021–22 (Effective from the academic year 2021 – 22)

I SEMESTER B.E. (PHYSICS GROUP)

Sl. No	Course and Course Code		Course title	Offering Department	Teaching Department	Teaching Hours / Week			Examination			Credits
						Theory Lecture	Tutorial	Practical / Drawing	CIE Marks	SEE Marks	Total Marks	
						L	T	P				
1	BSC	21MAT11	Linear Algebra and Calculus	Mathematics	Mathematics	2	2	--	50	50	100	3
2	BSC	21PHY12	Engineering Physics	Physics	Physics	2	2	-	50	50	100	3
3	ESC	21CSE13	C Programming	CSE	Any	2	2	--	50	50	100	3
4	ESC	21CIV14	Engineering Mechanics	Civil	CV/ME	2	2	--	50	50	100	3
5	ESC	21MEG15	Computer Aided Engineering Drawing	Mechanical	Mechanical	2	--	2	50	50	100	3
6	ESC	21ELN16	Elements of Electronics Engineering	EC	EC	3	-	-	50	50	100	3
7	ESC	21CSCL17	C Programming Laboratory	CSE	Any	--	--	2	50	50	100	1
8	BSC	21PHYL18	Engineering Physics Laboratory	Physics	Physics	-	--	2	50	50	100	1
9	HSMC	21EGH19	Communicative English	Humanities	Any	1	--	--	50	50	100	1
					TOTAL	**14**	**08**	**06**	**450**	**450**	**900**	**21**

Note: BSC- Basic Science Course, ESC- Engineering Science Course, HSMC- Humanity, Social Science and Management course

Dean Academic
Global Academy of Technology,
Rajarajeshwarinagar, Bengaluru-98

GLOBAL ACADEMY OF TECHNOLOGY (Autonomous Institution Under VTU)

Scheme of Teaching and Examination 2021–22 (Effective from the academic year 2021 – 22)

I SEMESTER B.E. (CHEMISTRY GROUP)

Sl. No	Course and Course Code		Course title	Offering Department	Teaching Department	Teaching Hours / Week			Examination			Credits
						Theory Lecture	Tutorial	Practical / Drawing	CIE Marks	SEE Marks	Total Marks	
						L	T	P				
1	BSC	21MAT11	Linear Algebra and Calculus	Mathematics	Mathematics	2	2	--	50	50	100	3
2	BSC	21CHE12	Engineering Chemistry	Chemistry	Chemistry	2	2	-	50	50	100	3
3	ESC	21CSE13	C Programming	CSE	Any	2	2	--	50	50	100	3
4	ESC	21ELE14	Fundamentals of Electrical Engineering	EEE	EEE	2	2	-	50	50	100	3
5	ESC	21MEE15	Elements of Mechanical Engineering	ME	ME/AE	3	--	--	50	50	100	3
6	ESC	21ELEL16	Fundamentals of Electrical Engineering Laboratory	EEE	EEE	-	--	2	50	50	100	1
7	ESC	21CSCL17	C Programming Laboratory	CSE	Any	--	--	2	50	50	100	1
8	BSC	21CHEL18	Engineering Chemistry Laboratory	Chemistry	Chemistry	-	--	2	50	50	100	1
9	HSMC	21IDT19	Innovation and Design Thinking	Humanities	Any	1	--	--	50	50	100	1
					TOTAL	12	08	06	450	450	900	19

Note: BSC- Basic Science Course, ESC- Engineering Science Course, HSMC- Humanity, Social Science and Management course

GLOBAL ACADEMY OF TECHNOLOGY (Autonomous Institution Under VTU)

Scheme of Teaching and Examination 2021–22 (Effective from the academic year 2021 – 22)

II SEMESTER B.E. (PHYSICS GROUP)

Sl. No	Course and Course Code		Course title	Offering Department	Teaching Department	Teaching Hours / Week			Examination			Credits
						Theory Lecture	Tutorial	Practical / Drawing	CIE Marks	SEE Marks	Total Marks	
						L	T	P				
1	BSC	21MAT21	Differential Equations and Integral Calculus	Mathematics	Mathematics	2	2	--	50	50	100	3
2	BSC	21PHY22	Engineering Physics	Physics	Physics	2	2	-	50	50	100	3
3	ESC	21CSE23	Python Programming	CSE	Any	2	2	--	50	50	100	3
4	ESC	21CIV24	Engineering Mechanics	Civil	CV/ME	2	2	--	50	50	100	3
5	ESC	21MEG25	Computer Aided Engineering Drawing	Mechanical	Mechanical	2	--	2	50	50	100	3
6	ESC	21ELN26	Elements of Electronics Engineering	EC	EC	3	-	-	50	50	100	3
7	ESC	21CSPL27	Python Programming Laboratory	CSE	Any	--	--	2	50	50	100	1
8	BSC	21PHYL28	Engineering Physics Laboratory	Physics	Physics	-	--	2	50	50	100	1
9	HSMC	21EGH29	Communicative English	Humanities	Any	1	--	--	50	50	100	1
					TOTAL	**14**	**08**	**06**	**450**	**450**	**900**	**21**

Note: BSC- Basic Science Course, ESC- Engineering Science Course, HSM- Humanity, Social Science and Management course

GLOBAL ACADEMY OF TECHNOLOGY (Autonomous Institution Under VTU)

Scheme of Teaching and Examination 2021–22 (Effective from the academic year 2021 – 22)

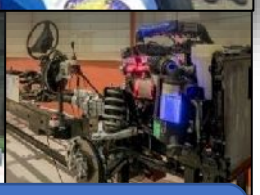
II SEMESTER B.E. (CHEMISTRY GROUP)

Sl. No	Course and Course Code		Course title	Offering Department	Teaching Department	Teaching Hours / Week			Examination			Credits
						Theory Lecture	Tutorial	Practical / Drawing	CIE Marks	SEE Marks	Total Marks	
						L	T	P				
1	BSC	21MAT21	Differential Equations and Integral Calculus	Mathematics	Mathematics	2	2	--	50	50	100	3
2	BSC	21CHE22	Engineering Chemistry	Chemistry	Chemistry	2	2	-	50	50	100	3
3	ESC	21CSE23	Python Programming	CSE	Any	2	2	--	50	50	100	3
4	ESC	21ELE24	Fundamentals of Electrical Engineering	EEE	EEE	2	2	-	50	50	100	3
5	ESC	21MEE25	Elements of Mechanical Engineering	ME	ME/AE	3	--	--	50	50	100	3
6	ESC	21ELEL26	Fundamentals of Electrical Engineering Laboratory	EEE	EEE	-	--	2	50	50	100	1
7	ESC	21CSPL27	Python Programming Laboratory	CSE	Any	--	--	2	50	50	100	1
8	HSMC	21CHEL28	Engineering Chemistry Laboratory	Chemistry	Chemistry	-	--	2	50	50	100	1
9	HSMC	21IDT29	Innovation and Design Thinking	Humanities	Any	1	--	--	50	50	100	1
					TOTAL	**12**	**08**	**06**	**450**	**450**	**900**	**19**

Note: BSC- Basic Science Course, ESC- Engineering Science Course, HSMC- Humanity, Social Science and Management course

III - VIII Semester Scheme (2021) Department of MECHANICAL ENGINEERING

SCHEME



Department of
MECHANICAL ENGINEERING

GLOBAL ACADEMY OF TECHNOLOGY
(Autonomous institution affiliated to VTU, Belagavi.
Accredited by NAAC with 'A' grade,
NBA Accredited CS, E&C, E&E, MECH and IS branches)
IDEAL HOMES TOWNSHIP,
RAJA RAJESHWARI NAGAR,
BENGALURU - 560098

Head of Department
Mechanical Engineering
Global Academy of Technology
Bangalore - 98

Global Academy of Technology – An Overview

(Autonomous Institution under Visvesvaraya Technological University, Belagavi)

Vision of the Institute:

Become a premier institution imparting quality education in engineering and management to meet the changing needs of society.

Mission of the Institute:

- **Create environment conducive for continuous learning through quality teaching and learning processes supported by modern infrastructure.**
- **Promote Research and Innovation through collaboration with industries.**
- **Inculcate ethical values and environmental consciousness through holistic education programs.**

Objectives:

With a very firm resolve, Global Academy of Technology is continuously investing untiring efforts to enable students to:

- Develop careers in Government and Private engineering organizations and other professionally related domains.
- Pursue higher studies and research to develop innovative solutions and technologies in engineering and other multi-disciplinary areas.
- Improve professional and personal traits oriented towards professional ethics and environmental compulsions.
- Inculcate professional leadership and successful entrepreneurship qualities.
- Help society in raising the quality of life.

Quality Policies:

a. Providing Excellent Education Through High Quality, Experienced and Committed Faculty.
b. Evolving creative processes for optimal Knowledge and Skill Transfer.
c. Building up state-of-the-art infrastructure at par with international standards.
d. Creating an environment for holistic personality development and develop research temperament.

HALLMARKS OF GLOBAL ACADEMY OF TECHNOLOGY:

- Proactive management determined to build the institute as a Centre of Excellence in engineering education.
- Qualified and dedicated faculty in all the departments.
- State of the art Infrastructure and up to date laboratory and Library facilities.
- Lush green campus with an environment of tranquillity and harmony.
- Student centric teaching-learning processes banking on Outcome Based Education; students friendly learning atmosphere.
- Emphasis on Project based learning throughout the course.

Head of Department
Mechanical Engineering
Global Academy of Technology
Bangalore - 98

- Strong Industry-Institute interface with more than twenty Memorandum of Understanding (MOUs) signed with leading industries and institutions of repute.
- Indian Institute of Information Technology (IIIT), Allahabad, has signed a MOU for providing internships to students of GAT, research assistance to faculty, and conducting Faculty Development Programs in key areas of IT - Big Data, Cloud Computing, Artificial Intelligence, and Machine Learning.
- Mahatma Gandhi University, Kottayam, has signed a MOU to facilitate research in Nano Technology and provide research assistance to faculty of GAT.
- Industrial consultancy undertaken in many departments.
- Excellent Placement with more than 80% of the eligible students placed in leading IT companies, core industries and Start-up companies.
- Holistic and integrated training modules covering communication skills, leadership skills, soft skills and technical skills through professional trainers.
- On campus and off campus internship facilities.
- Robust parent connects and Student counselling system.
- In-house technical skill training programs/add on courses to enhance the employability of the students.
- Strong and growing alumni connect in place.
- Exclusive Research and Development, Industry–Institute Interaction Cell and Teaching and Learning Centre in place.
- Rainwater harvesting facility in the campus.

The following academic processes are implemented on a regular basis to sustain a meaningful and proactive teaching-learning environment:

- Emphasis on **continuous revision of the curriculum,** based on feedback from the students and input from industry, alumni, and other stakeholders.
- Conduction of regular **training programme** for faculty, technical & supporting staff.
- Conduction of Academic Audit of each department on an annual basis.
- Under **open electives** students have the options to study subjects offered by other departments to augment their interdisciplinary knowledge.
- Students have to do **value added courses**, mandatory courses, certificate courses, and become members of professional bodies, etc.
- Advanced and enrichment courses are offered as Electives during the final year UG and PG Degree Programmes.
- **Self-Learning** is encouraged in students through MOOCs, NPTEL/SWAYAM, Coursera, Edex etc. Credit shall be awarded to students for completion of such courses.

Head of Department
Mechanical Engineering
Global Academy of Technology
Bangalore - 98

Department of Mechanical Engineering

(Accredited by National Board of Accreditation, New Delhi)

Vision of the Department:

Become one of the leading providers of education in mechanical engineering with emphasis on research, development, and innovation for the benefit of society.

Mission of the Department:

- Impart quality technical education in the field of mechanical engineering through excellent teaching-learning process, modern infrastructure and computing tools
- Prepare students for successful careers by providing placements and encouraging research, development and innovation through industry-institute interaction
- Instil professional ethics and environmental consciousness amongst students through inclusive development programs

About the Department:

Mechanical Engineering is one of the broadest and the most versatile engineering profession finding its application in all fields of technology. The boost in the manufacturing sector has raised the demand for Mechanical Engineers exponentially. The uniqueness of the discipline incorporates skills and expertise in the areas of Design, Manufacturing, Mechanics and Thermal sciences besides inter-disciplinary subjects that are essential to most sectors of industry.

The department is achieving its milestones at various stages of its growth by upgrading the course-curriculum for catering the needs of industry and research, by developing and maintaining state-of-art laboratories CNC Technology, 3D Printing and Automation.

The department conducts various training programs in collaboration with renowned industrial organizations such as Toyota, AMS-India, TATA Electronics Pvt. Ltd, EMI Product, Askar Microns, etc.

Our student teams have developed Formula Car, Go Kart and Solar Powered Vehicle and participated in racing competitions, won prizes, and have brought laurels to our department and to the college.

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Bangalore - 98

PROGRAM EDUCATIONAL OBJECTIVES (PEOs) of the DEPARTMENT

PEO of Graduate students in Mechanical Engineering aims to have:

PEO1: Engineering competence, critical thinking, creativity, and ethical inclusivity in professional practice.

PEO2: Continuous intellectual growth through advanced education, professional development, independent inquiry, and experiential learning.

PEO3: Leadership and teamwork excellence throughout professional careers.

PROGRAM SPECIFIC OUTCOMES (PSOs) of the DEPARTMENT

After successful completion of Mechanical Engineering Program, the graduates will be able to:

PSO1: Specify, design, and analyze machine elements using CAD/CAE software.

PSO2: Evaluate thermal performance of Heating, Ventilation & Air-Conditioning systems, electronic systems, Solar Roof Top Photo-Voltaic systems using experimental approach or /and CFD tools and design these systems for better performance.

PSO3: Develop composite materials, manufacturing processes and products in an efficient, safe and cost-effective manner.

Head of Department
Mechanical Engineering
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Bangalore - 98

III - VIII SEMESTER SCHEME

Head of Department
Mechanical Engineering
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Bangalore - 98

Global Academy of Technology
(Autonomous Institution Affiliated to VTU)
Scheme of UG Autonomous Program – 2021 Batch

III SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Dept.	Teaching Hours/Week			Examination			CREDITS
					L	T	P	CIE	SEE	Total	
1	21MAT31C	Complex Variables & Probability	BS	MAT	2	2	0	50	50	100	3
2	21MED32	Strength of Materials (integrated)	IPC	Respective Department	3	0	2	50	50	100	4
3	21MED33	Manufacturing Process (Integrated)	IPC		3	0	2	50	50	100	4
4	21MED34	Thermodynamics	PC		2	2	0	50	50	100	3
5	21MED35	Material Science and Metallurgy	PC		3	0	0	50	50	100	3
7	21KSK36/46	Samskrutika Kannada	HSM	Any Department	1	0	0	50	50	100	1
	21KBK36/46	Balake Kannada									
	OR										
	21CPH36/46	Constitution of India and Professional Ethics									
8	21MED37	Ability Enhancement Course – I : **Modelling & 3D Printing**	PC	Respective Department	0	0	2	50	50	100	1
							Total	**350**	**350**	**700**	**19**
9	21MATDIP31	Additional Mathematics (For Lateral Entry Students)	BS	MAT	2	2	0	100	--	100	0

IV SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Dept.	Teaching Hours/Week			Examination			CREDITS
					L	T	P	CIE	SEE	Total	
1	21MAT41C	Transforms Calculus and Numerical Techniques	BS	MAT	2	2	0	50	50	100	3
2	21MED42	Mechanical Measurements & Metrology (Integrated)	IPC	Respective Department	3	0	2	50	50	100	4
3	21MED43	Mechatronics	PC		3	0	0	50	50	100	3
4	21MED44	Theory of Machines	PC		2	2	0	50	50	100	3
5	21MED45	Computer Aided Modelling	PC		2	0	2	50	50	100	3
7	21KSK36/46	Samskrutika Kannada	HSM	Any Department	1	0	0	50	50	100	1
	21KBK36/46	Balake Kannada									
	OR										
	21CPH36/46	Constitution of India and Professional Ethics									
8	21MED47	Ability Enhancement Course – II: Automotive Engines, GD&T.	PC	Respective Department	0	0	2	50	50	100	1
9	21INT48	Inter/Intra Institutional Internship	INT	Respective Department	0	0	3	100	-	100	2
10	21MEDL49	Machine Shop	PC	Respective Department	0	0	1	50	50	100	1
							Total	**450**	**350**	**800**	**21**

Head of Department
Mechanical Engineering
Global Academy of Technology
Bangalore - 98

Global Academy of Technology
(Autonomous Institution Affiliated to VTU)
Scheme of UG Autonomous Program – 2021 Batch

V SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Dept.	Teaching Hours/Week			Examination			CREDITS
					L	T	P	CIE	SEE	Total	
1	21MED51	Management & Economics	PC	Respective Department	3	0	0	50	50	100	3
2	21MED52	Fluid Mechanics & Machinery (Integrated)	IPC		3	0	2	50	50	100	4
3	21MED53	Design of Machine Elements	PC		2	2	0	50	50	100	3
4	21MED54X	Program Elective 1	PEC		3	0	0	50	50	100	3
5	21MED55	Research Methodology	AEC		3	0	0	50	50	100	3
6	21MED56	Ability Enhancement Course - III: Automation Through Hydraulics & Pneumatics.	AEC		0	0	2	50	50	100	1
7	21CIV57/67	Environmental Science	HSM	Civil	1	0	0	50	50	100	1
	OR										
	21UHV57/67	Universal Human Values	HSM	Any Department							
8	21MEDL58	Fuel and Engine Testing Laboratory	PC	Respective Department	0	0	2	50	50	100	1
							TOTAL	**400**	**400**	**800**	**19**

VI SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Dept.	Teaching Hours/Week			Examination			CREDITS
					L	T	P	CIE	SEE	Total	
1	21MED61	Industrial Robotics	PC	Respective Department	3	0	0	50	50	100	3
2	21MED62	Heat Transfer (Integrated)	IPC		3	0	2	50	50	100	4
3	21MED63	Finite Element Methods (Integrated)	IPC		3	0	2	50	50	100	4
4	21MED64X	Program Elective 2	PEC		3	0	0	50	50	100	3
5	21MED65X	Open Elective 1	OEC	Respective Offering Department	3	0	0	50	50	100	3
6	21MED66	Ability Enhancement Course – IV: CNC Technology.	AEC	Respective Department	0	0	2	50	50	100	1
7	21CIV57/67	Environmental Science	HSM	Civil	1	0	0	50	50	100	1
	OR										
	21UHV57/67	Universal Human Values	HSM	Any Department							
8	21MEDP68	Mini Project	MP	Respective Department	Two Contact hours per week			50	50	100	2
							TOTAL	**400**	**400**	**800**	**21**

Head of Department
Mechanical Engineering
Global Academy of Technology
Bangalore - 98

Program Elective & Open Elective

Program Elective - 1		
Sl. No.	**Course Code**	**Course Title**
1	21MED541	Design for Manufacturing & Assembly
2	21MED542	Energy, Environment and Sustainable Development
3	21MED543	Additive Manufacturing
4	21MED544	Product Life Cycle Management
Program Elective - 2		
Sl. No.	**Course Code**	**Course Title**
1	21MED641	Mechanical Vibrations & Condition Monitoring
2	21MED642	Automotive Engineering and Hybrid Vehicle Technology
3	21MED643	Design of Transmission Elements
4	21MED644	Data Analytics

Open Elective - 1		
Sl. No.	**Course Code**	**Course Title**
1	21MED651	Project & Operations Management
2	21MED652	Quantitative Techniques

Head of Department
Mechanical Engineering
Global Academy of Technology
Bangalore - 98

Global Academy of Technology
(Autonomous Institution Affiliated to VTU)
Scheme of UG Autonomous Program – 2021 Batch

VII SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Dept.	Teaching Hours/Week			Examination			CREDITS
					L	T	P	CIE	SEE	Total	
1	21MED71	Project & Operations Management	PC	Respective Department	3	0	0	50	50	100	3
2	21MED72	Advanced Manufacturing Systems (Integrated)	IPC		3	0	2	50	50	100	4
3	21MED73	Smart Materials & MEMS	PC		3	0	0	50	50	100	3
4	21MED74X	Program Elective 3	PEC		3	0	0	50	50	100	3
5	21MED75X	Open Elective 2	OEC	Respective Offering Department	3	0	0	50	50	100	3
6	21MED76	Project Phase 1	MP	Two Contact hours per week				100	-	100	2
7	21MEDL77	Design & Simulation Laboratory	PC	Respective Department	0	0	2	50	50	100	1
				TOTAL				**400**	**300**	**700**	**19**

VIII SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Dept.	Teaching Hours/Week			Examination			CREDITS
					L	T	P	CIE	SEE	Total	
1	21MED81X	Program Elective 4	PEC	Respective Department	3	0	0	50	50	100	3
2	21MED82X	Program Elective 5	PEC		3	0	0	50	50	100	3
3	21MED83	Project work phase – II	MP	Two Contact hours per week				100	100	200	12
4	21MED84	Technical Seminar	MP	One Contact hours per week				100	--	100	1
5	21MED85	Internship	INT	Completed during the intervening period of VI and VII Semester				50	50	100	2
				TOTAL				**350**	**250**	**600**	**21**

Head of Department
Mechanical Engineering
Global Academy of Technology
Bangalore - 98

Program Elective & Open Elective

Program Elective - 3		
Sl. No.	**Course Code**	**Course Title**
1	21MED741	Control Engineering
2	21MED742	Refrigeration & Air Conditioning
3	21MED743	Composite Material Technology
4	21MED744	Total Quality Management
Program Elective - 4		
Sl. No.	**Course Code**	**Course Title**
1	21MED811	Renewable Energy Technologies
2	21MED812	Thermal Management of Electronic Equipment's
3	21MED813	Operations Research
4	21MED814	Supply Chain Management
Program Elective - 5		
Sl. No.	**Course Code**	**Course Title**
1	21MED821	Tribology
2	21MED822	Computational Fluid Dynamics
3	21MED823	Industry 4.0
4	21MED824	Non-Traditional Machining

Open Elective - 2		
Sl. No.	**Course Code**	**Course Title**
1	21MED751	Additive Manufacturing
2	21MED752	Supply Chain Management

Head of Department
Mechanical Engineering
Global Academy of Technology
Bangalore - 98