Curriculum for B. Tech
Guru Nanak Institute of Technology
Under Autonomy
Electronics & Computer Science Engineering

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First Year First Semester

Sl. No.	Category	Course Code	Course Title	Hours per week				Credits
	A. THEORY			L	T	P	Total	
1	Basic Science course	PH101	Physics-I	3	0	0	3	3
2	Basic Science course	M101	Mathematics –I	4	0	0	4	4
3	Humanities and Social Sciences including Management courses	HSMC 101	Professional Communication	2	0	0	**2**	2
	B. PRACTICAL							
4	Basic Science course	PH191	Physics-I Lab	0	0	3	3	1.5
5	Engineering Science Courses	ME 191	Workshop & Manufacturing Practices Lab	0	0	3	3	1.5
6	PROJECT	PR191	Theme based Project I	0	0	1	1	0.5
7	PROJECT	PR192	Skill Development I: Soft Skill	0	0	1	1	0.5
	C. MANDATORY ACTIVITIES / COURSES							
8	Mandatory Course	MC181	Induction Program	0	0	0	0	2Units
	TOTAL CREDIT							13.0

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First Year 2nd Semester

Sl. No.	Category	Course Code	Course Title	Hours per week				Credits
	A. THEORY			L	T	P	Total	
1	Basic Science courses	CH 201	Chemistry-I	3	0	0	3	3
2	Basic Science courses	M 201	Mathematics –II	4	0	0	4	4
3	Engineering Science Courses	EE 201	Basic Electrical Engineering	3	0	0	3	3
4	Engineering Science Courses	CS 201	Programming for Problem Solving	3	0	0	3	3
	B. PRACTICAL							
5	Basic Science course	CH 291	Chemistry-I Lab	0	0	3	3	1.5
6	Humanities and Social Sciences including Management courses	HSMC 191	Professional Communication LAB	0	0	2	2	1.0
7	Engineering Science Courses	EE 291	Basic Electrical Engineering Lab	0	0	3	3	1.5
8	Engineering Science Courses	ME 292	Engineering Graphics & Design Lab	0	0	3	3	1.5
9	Engineering Science Courses	CS 291	Programming for Problem Solving Lab	0	0	3	3	1.5
10	PROJECT	PR291	Theme based Project II	0	0	1	1	0.5
11	PROJECT	PR292	Skill Development II: Life Skill	1	0	0	1	0.5
	C. MANDATORY ACTIVITIES / COURSES							
12	Mandatory Course	MC281	NSS/Physical Activities / Meditation & Yoga / Photography	0	0	3	3	3 Units
	TOTAL CREDIT							21

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2nd Year 1st Semester

Sl. No.	Category	Course Code	Course Title	Hours per week				Credits
				L	**T**	**P**	**Total**	
A. THEORY								
1	Basic Science course	M 301	Mathematics III	3	0	0	3	3
2	Engineering Science Courses	ECS 301	Circuit Theory and Networks	3	0	0	3	3
3	Engineering Science Courses	ECS 302	Operating System	3	0	0	3	3
4	Program Core Course	ECS 303	Data structure and Algorithm	3	0	0	3	3
5	Program Core Course	ECS 304	Optoelectronics	3	0	0	3	3
6	Humanities and Social Sciences including Management courses	HSMC 303	Universal Human Values 2: Understanding Harmony	3	0	0	3	3
B. PRACTICAL								
7	Engineering Science Courses	M (CS)391	Numerical Method lab	0	0	3	3	1.5
8	Engineering Science Courses	ECS 391	Circuit Theory and Networks Lab	0	0	3	3	1.5
9	Engineering Science Courses	ECS 392	Operating System Lab	0	0	3	3	1.5
10	Program Core Course	ECS 393	Data structure and Algorithm Lab	0	0	3	3	1.5
11	PROJECT	PR391	Theme based Project III	0	0	1	1	0.5
12	PROJECT	PR392	Skill Development III: Technical Seminar Presentation	1	0	0	1	0.5
C. MANDATORY ACTIVITIES / COURSES								
13	MC	MC 301	Environmental Science		0	3	3	3 Units
	TOTAL CREDIT WITHOUT MOOCS COURSES							25
D.MOOCS COURSES**								
14	MOOCS COURSES	HM301	MOOCS COURSE-I		3	1	4	4
TOTAL CREDIT WITH MOOCS COURSES								29

**** MOOCS COURSES for HONOURS/MINOR Degree are Program sECSific and to be taken from MOOCS BASKET**

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2nd Year 2nd Semester

Sl. No.	Category	Course Code	Course Title	Hours per week				Credits
				L	**T**	**P**	**Total**	
A. THEORY								
1	Basic Science course	PH (ECSE) 401	Physics-II	3	0	0	3	3
2	PC	ECS 401	Microprocessor and Microcontroller	3	0	0	3	3
3	PC	ECS 402	Computer Organization and Architecture	3	0	0	3	3
4	PC	ECS 403	Data Base Management System	3	0	0	3	3
5	PC	ECS 404	Analog & Digital Electronics	3	0	0	3	3
6	Humanities and Social Sciences including Management courses	HSMC 402	Gender Culture and Development	2	0	0	2	2
B. PRACTICAL								
7	Basic Science course	PH (ECSE) 491	Physics-II lab	0	0	2	2	1
8	PC	ECS 491	Microprocessor and Microcontroller Lab	0	0	3	3	1.5
9	PC	ECS 492	Computer Organization and Architecture Lab	0	0	3	3	1.5
10	PC	ECS 493	Data Base Management System Lab	0	0	3	3	1.5
11	PC	ECS 494	Analog & Digital Electronics Lab	0	0	3	3	1.5
12	PROJECT	PR 491	Theme based Project IV	0	0	1	1	0.5
13	PROJECT	PR 492	Skill Development IV: Soft Skill & Aptitude-I	1	0	0	1	0.5
C. MANDATORY ACTIVITIES / COURSES								
14	MC	MC 481	Learning an Art Form [vocal or instrumental, dance, painting, clay modeling, etc.] OR Environmental Protection Initiatives	0	0	0	3	3Units
	TOTAL CREDIT WITHOUT MOOCS COURSES							25.0
D.MOOCS COURSES								
15	MOOCS COURSES	HM 401	MOOCS COURSE-II	3	1	0	4	4
TOTAL CREDIT WITH MOOCS COURSES								**29.0**

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3rd Year 1st Semester

Sl. No.	Category	Course Code	Course Title	Hours per week				Credits
				L	**T**	**P**	**Total**	
A. THEORY								
1	Humanities and Social Sciences including Management courses	HSMC 505	Principles of Management	2	0	0	2	2
2	PC	ECS 501	Communication Engineering	3	0	0	3	3
3	PC	ECS 502	Control System Engineering	3	0	0	3	3
4	PC	ECS 503	Software Engineering and Web Technology	3	0	0	3	3
5	PE	ECS 504A	Object Oriented Programming with JAVA	3	0	0	3	3
		ECS 504B	Information Theory and Coding					
		ECS 504C	Sensors and Applications					
B. PRACTICAL								
7	PC	ECS 591	Communication Engineering Lab	0	0	3	3	1.5
8	PC	ECS 592	Control System Engineering Lab	0	0	3	3	1.5
9	PC	ECS 593	Software Engineering and Web Technology Lab	0	0	3	3	1.5
10	PE	ECS 594 A	Object Oriented Programming with JAVA Lab	0	0	3	3	1.5
		ECS 594B	Information Theory and Coding Lab					
		ECS 594C	Sensors and Applications Lab					
11	PROJECT	PR 591	Minor Project I	0	0	3	3	1
12	PROJECT	PR 592	Skill Development V: Soft Skill & Aptitude-II	1	0	0	1	0.5
C. MANDATORY ACTIVITIES / COURSES								
14	MC	MC 501	Constitution of India	3	0	0	3	3Units
	TOTAL CREDIT WITHOUT MOOCS COURSES							21.5
D. MOOCS COURSES**								
15	MOOCS COURSES	HM501	MOOCS COURSE-III	3	1	0	4	4
TOTAL CREDIT WITH MOOCS COURSES								**25.5**

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3rd Year 2nd Semester

Sl. No.	Category	Course Code	Course Title	Hours per week				Credits
				L	T	P	Total	
A. THEORY								
1	Humanities and Social Sciences including Management courses	HSMC 604	Economics for Engineers	2	0	0	2	2
2	PC	ECS 601	Computer Networking	3	0	0	3	3
3	PC	ECS 602	Digital Signal Processing	3	0	0	3	3
4	PE	ECS 603A	Industrial Automation	3	0	0	3	3
		ECS 603B	Introduction to IoT					
		ECS 603C	Soft Computing					
5	PE	ECS 604A	Artificial Intelligence	3	0	0	3	3
		ECS 604B	Optical and Satellite communication					
		ECS 604C	Compiler Design					
6	OE	ECS 605A	Bio Informatics	3	0	0	3	3
		ECS 605B	Introduction to Robotics					
		ECS 605C	Industrial Drives					
B. PRACTICAL								
7	PC	ECS691	Computer Networking Lab	0	0	3	3	1.5
9	PC	ECS692	Digital Signal Processing Lab	0	0	3	3	1.5
10	PE	ECS 693A	Industrial automation Lab	0	0	3	3	1.5
		ECS 693B	Introduction to IoT Lab					
		ECS 693C	Soft Computing Lab					
11	PROJECT	PR 691	Minor Project II	0	0	3	2	1
12	PROJECT	PR 692	Skill Development VI: Soft Skill & Aptitude-III	1	0	0	1	0.5
C. MANDATORY ACTIVITIES / COURSES								
13	MC	MC 601	Intellectual Property Right	3	0	0	3	3Units
	TOTAL CREDIT WITHOUT MOOCS COURSES							23.0
D.MOOCS COURSES**								
14	MOOCS COURSES	HM 601	MOOCS COURSE-IV	3	1	0	4	4
TOTAL CREDIT WITH MOOCS COURSES								**27.0**

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4th Year 1st Semester

Sl No	Course Code	Paper Code	Theory	Contact Hours/Week				Credit Points
				L	T	P	Total	
A. THEORY								
1	PE	ECS701A	Embedded System Design	3	0	0	3	3
		ECS701B	Digital Image Processing					
		ECS701C	Cloud Computing					
2	PE	ECS702A	Quantum Computing	3	0	0	3	3
		ECS702B	Information theory and Coding					
		ECS702C	Wireless Sensor Network					
3	OE	ECS 703A	Power Electronics	3	0	0	3	3
		ECS 703B	Virtual Instrumentation					
		ECS 703C	Machine Learning using Python					
4	OE	ECS 704A	Electromagnetic Wave	3	0	0	3	3
		ECS 704B	Cyber Law and Ethics					
		ECS 704C	Cryptography and Network Security					
B. PRACTICAL								
5	PE	ECS 791A	Embedded System Design Lab	0	0	0	3	1.5
		ECS 791B	Digital Image Processing Lab					
		ECS 791C	Cloud Computing Lab					
6	OE	ECS 793A	Power Electronics Lab	0	0	3	3	1.5
		ECS 793B	Virtual Instrumentation Lab					
		ECS 793C	Machine Learning using Python Lab					
7	PROJECT	PR 791	Major Project-I	0	0	0	4	2
8	PROJECT	PR 792*	Industrial Training / Internship	0	0	0	0	1
9	PROJECT	PR 793	Skill Development VII: Seminar & Group Discussion	1	0	0	1	0.5
C. MANDATORY ACTIVITIES / COURSES								
10	MC	MC 781	Entrepreneurship & Innovation Skill	0	0	3	3	3 units
TOTAL CREDIT WITHOUT MOOCS COURSES								18.5
D.MOOCS COURSES**								
11	MOOCS COURSES	HM701	MOOCS COURSE-V	3	1	0	4	4
TOTAL CREDIT WITH MOOCS COURSES								**22.5**

***Collective Data from 3rd to 6th Semester (Summer/Winter Training during Semester Break & Internship should be done after 5th Semester or**

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6th Semester). All related certificates to be collected by the training/internship coordinator(s).

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4th Year 2nd Semester

Sl No	Course Code	Paper Code	Theory	Contact Hours /Week				Credit Points
				L	T	P	Total	
A. THEORY								
1	PE	ECS801A	Real Tme System	3	0	0	3	3
		ECS801B	Low power VLSI Design					
		ECS801C	Multimedia and Virtual Reality					
2	OE	ECS 802A	MEMS Technology	3	0	0	3	3
		ECS 802B	Simulation and Modelling					
		ECS 802C	Biomedical Electronics					
3	OE	ECS 803A	Mobile Communication	3	0	0	3	3
		ECS 803B	Big Data Analytics					
		ECS 802C	Nanotechnology					
B. PRACTICAL								
4	PROJECT	PR 891	Major Project-II	0	0	0	12	6
5	PROJECT	PR 892	Grand Viva	0	0	0	0	1
C. MANDATORY ACTIVITIES / COURSES								
8	MC	MC 881	Essence of Indian Knowledge Tradition	0	0	3	3	3 Units
TOTAL CREDIT								16