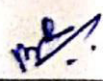
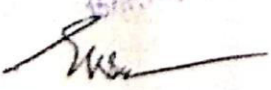


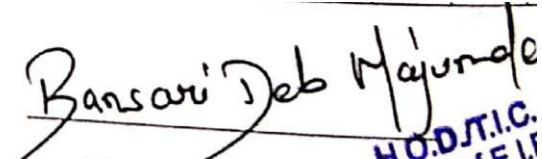
# Department of Applied Electronics and Instrumentation Engineering


*Revised Curriculum Structure  
(to be effective from 2018-22 Batch)*

*1<sup>st</sup> to 8<sup>th</sup> Semester*

  
\_\_\_\_\_  
(Head of the Department, AEIE, GNIT)  
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\_\_\_\_\_  
(Principal, GNIT)  
**Principal**  
**Gurunanak Institute of Technology**

  
\_\_\_\_\_  
(Teacher in charge, EIE, Dept. of E.I.E.)  
**H.O.D./T.I.C.**  
**Dept. of E.I.E.**  
**NARULA INSTITUTE OF TECHNOLOGY**

  
\_\_\_\_\_  
(Principal, NIT)  
**Principal**  
**Narula Institute of Technology**  
**81, Nilgunj Road, Agarpara**  
**Kolkata-700 109**

**Curriculum for Applied Electronics & Instrumentation Engineering**  
**Under Autonomy (GR A: ECE, EE, EIE, BME; GR B: CSE, IT, ME, CE, FT)**

1 <sup>st</sup> Semester								
Sl No	Paper Code		Theory	Contact Hours /Week				Credit Points
				L	T	P	Total	
<b>A. THEORY</b>								
1	M 101	BS	Mathematics -I	3	1	0	4	4
2	CH 101	BS	Chemistry-I	3	0	0	3	3
3	EE 101/	ES	Basic Electrical Engineering	3	0	0	3	3
4	HU 101	HS	English	2	0	0	2	2
<b>Total of Theory</b>							<b>12</b>	<b>12</b>
<b>B. PRACTICAL</b>								
5	CH 191	BS	Chemistry-I Lab	0	0	3	3	1.5
6	EE 191	ES	Basic Electrical Engineering Lab	0	0	3	3	1.5
7	ME 191	ES	Engineering Graphics & Design	0	0	3	3	1.5
<b>C. SESSIONAL</b>								
8	XC181	XC	Extra-Curricular Activity I	0	0	0	0	2 units
<b>D. PROJECT*</b>								
9	Project Code	Project Name		Contact Hours /Week				Credit Points
	M 151	Mathematics Project		1				0.5
	CH 151	Chemistry Project		1				0.5
	EE 151	Basic Electrical Project		1				0.5
	HU151	English Project		1				0.5
<b>Total of Theory, Practical, Sessional &amp; Project</b>				<b>23</b>				<b>16.5 +1</b>

\* Student need to select any two projects (Total Credit: 0.5+0.5=1)

2 <sup>nd</sup> Semester								
Sl No	Paper Code		Theory	Contact Hours /Week				Credit Points
				L	T	P	Total	
<b>A. THEORY</b>								
1	M 201	BS	Mathematics -II	3	1	0	4	4
2	PH 201	BS	Physics - I	3	0	0	3	3
3	EC 201	ES	Basic Electronics Engineering	3	0	0	3	3
4	CS 201	ES	Programming for Problem Solving	3	0	0	3	3
5	ME 201	ES	Engineering Mechanics	3	0	0	3	3
<b>Total of Theory</b>							<b>16</b>	<b>16</b>
<b>B. PRACTICAL</b>								
6	CS291	ES	Programming for Problem Solving Lab	0	0	3	3	1.5
7	PH 291	BS	Physics -I Lab	0	0	3	3	1.5
8	EC 291	ES	Basic Electronics Engineering Lab	0	0	3	3	1.5
9	ME 292	ES	Workshop/Manufacturing Practice	0	0	3	3	1.5
10	HU 291	HS	Language Lab and Seminar Presentation	0	0	2	2	1
<b>C. SESSIONAL</b>								
11	XC 281	XC	Extra-Curricular Activity II	0	0	0	0	2 Units
<b>D. PROJECT*</b>								
12	Project Code	Project Name		Contact Hours /Week				Credit Points
	M 251	Mathematics Project		1				0.5
	CS 251	Programming for Problem Solving Project		1				0.5
	ME 251	Engineering Mechanics Project		1				0.5
	PH 251	Physics Project		1				0.5
	EC 251	Basic Electronics Project		1				0.5
<b>Total of Theory, Practical, Sessional &amp; Project</b>				<b>32</b>				<b>23+1</b>

\* Student need to select any two projects (Total Credit: 0.5+0.5=1)

3 <sup>rd</sup> Semester								
Sl No	Paper Code		Theory	Contact Hours /Week				Credit Points
				L	T	P	Total	
<b>A. THEORY</b>								
1	M 301	BS	Mathematics – III	3	1	0	4	4
2	EI 301	PC	Analog Electronic Circuits	3	0	0	3	3
3	EI 302	PC	Digital Electronic Circuits	3	0	0	3	3
4	EI 303	ES	Circuit Theory and Networks	3	1	0	4	4
5	EI 304	PC	Electrical & Electronic Measurement & Instrumentation	3	0	0	3	3
<b>Total of Theory</b>							<b>17</b>	<b>17</b>
<b>B. PRACTICAL</b>								
6	EI 391	PC	Analog Electronic Circuits Lab	0	0	3	3	1.5
7	EI 392	PC	Digital Electronic Circuits Lab	0	0	3	3	1.5
8	EI 393	ES	Circuits Theory and Networks Lab	0	0	3	3	1.5
9	EI394	PC	Electrical & Electronic Measurement & Instrumentation Lab	0	0	3	3	1.5
<b>C.SESSIONAL</b>								
10	MC 301	MC	Technical Skill Development-I	2	0	0	2	2units
<b>D. PROJECT*</b>								
11	Project Code	Project Name		Contact Hours /Week				Credit Points
	M 351	Mathematics- III Project		1				0.5
	EI 351	Analog Electronic Circuits Project		1				0.5
	EI 352	Digital Electronic Circuits Project		1				0.5
	EI 353	Circuit Theory and Networks Project		1				0.5
	EI 354	Electrical & Electronic Measurement & Instrumentation Project		1				0.5
<b>Total of Theory, Practical, Sessional &amp; Project</b>				<b>33</b>				<b>23+2</b>

\* Student need to select any four projects (Total Credit: 0.5+0.5+0.5+0.5=2)

4 <sup>th</sup> Semester								
Sl No	Paper Code		Theory	Contact Hours /Week				Credit Points
				L	T	P	Total	
<b>A. THEORY</b>								
1	PH 401	BS	Physics – II	3	0	0	3	3
2	EI 401	PC	Sensors and Transducers	3	0	0	3	3
3	EI 402	PC	Microprocessors and Microcontrollers	3	0	0	3	3
4	EI403	PC	Electromagnetic Theory and Transmission Line	3	0	0	3	3
5	EI 404	PC	Digital Signal Processing	3	0	0	3	3
<b>Total of Theory</b>							<b>15</b>	<b>15</b>
<b>B. PRACTICAL</b>								
6	PH 491	BS	Physics –II Lab	0	0	3	3	1.5
7	EI 491	PC	Sensors and Transducers Lab	0	0	3	3	1.5
8	EI 492	PC	Microprocessor and Microcontrollers Lab	0	0	3	3	1.5
9	EI494	PC	Digital Signal Processing Lab	0	0	3	3	1.5
<b>C.SESSIONAL</b>								
10	HU 481	HS	Technical report writing & language practice laboratory Practice	0	0	2	2	1
11	MC401	MC	Environment Studies	2	0	0	2	2 Units
<b>D. PROJECT*</b>								
12	<b>Project Code</b>		<b>Project Name</b>	<b>Contact Hours /Week</b>				<b>Credit Points</b>
	PH 451		Physics-II Project	1				0.5
	EI 451		Sensors and Transducers Project	1				0.5
	EI 452		Microprocessors and Microcontrollers Project	1				0.5
	EI453		Electromagnetic Theory and Transmission Line Project	1				0.5
	EI 454		Digital Signal Processing Project	1				0.5
<b>Total of Theory, Practical, Sessional &amp; Project</b>				<b>33</b>				<b>22+2</b>

\* Student need to select any four projects (Total Credit: 0.5+0.5+0.5+0.5=2)

5 <sup>th</sup> Semester								
Sl No	Paper Code		Theory	Contact Hours /Week				Credit Points
				L	T	P	Total	
<b>A. THEORY</b>								
1	HU503	HS	Economics for Engineers	2	0	0	2	2
2	EI 501	PC	Industrial Instrumentation	3	0	0	3	3
3	EI 502	PC	Analog & Digital Communication Theory	3	0	0	3	3
4	EI 503	PC	Control Engineering	3	0	0	3	3
5	EI 504A / EI 504B/ EI 504C	PE	Optoelectronics & Fibre Optic Sensors/ Soft Computing/ IoT based Instrumentation System	3	0	0	3	3
<b>Total of Theory</b>							<b>14</b>	<b>14</b>
<b>B. PRACTICAL</b>								
6	EI 591	PC	Industrial Instrumentation Lab	0	0	3	3	1.5
7	EI 593	PC	Analog & Digital Communication Lab	0	0	3	3	1.5
8	EI 595	PC	Control Engineering Lab	0	0	3	3	1.5
<b>C.SESSIONAL</b>								
9	EI 581	PW	GD & Seminar	0	0	0	3	1.5
10	MC501	MC	Foreign Language	2	0	0	2	2 Units
<b>C. PROJECT*</b>								
11	Project Code	Project Name		Contact Hours /Week				Credit Points
	HU551	Engineering Economics Project		1				0.5
	EI 551	Industrial Instrumentation Project		1				0.5
	EI 552	Analog & Digital Communication Theory Project		1				0.5
	EI 553	Control Engineering Project		1				0.5
	EI 554A / EI 554B / EI 554C	Optoelectronics & Fibre Optic Sensors Project/ Soft Computing Project / IoT based Instrumentation System Project		1				0.5
<b>Total of Theory, Practical, Sessional &amp; Project</b>				<b>30</b>				<b>20+2</b>

\* Student need to select any four projects (Total Credit:0.5+0.5+0.5+0.5=2)

6 <sup>th</sup> Semester								
Sl No	Paper Code	Theory		Contact Hours /Week				Credit Points
				L	T	P	Total	
<b>A. THEORY</b>								
1	EI 601	PC	Process Control-I	3	0	0	3	3
2	EI 602	PC	Bio Medical Instrumentation	3	0	0	3	3
3	EI 603A / EI 603B/ EI 603C	PE	Power Electronics / Industrial Drives/ Robotics Engineering	3	0	0	3	3
4	EI604A/ EI604B/ EI604C	PE	Artificial Intelligence / Non-Conventional Energy Sources/ Analytical Instrumentation	3	0	0	3	3
5	CS(EI)605A / CS(EI)605B/ CS(EI)605C	IE	Data Structures & Algorithms / Database Management System /Software Engineering	3	0	0	3	3
<b>Total of Theory</b>							<b>15</b>	<b>15</b>
<b>C. SESSIONAL</b>								
6	MC691	MC	Technical Skill development II- Python Programming	0	0	2	2	2 Units
<b>B. PRACTICAL</b>								
7	EI 691	PC	Process Control Lab	0	0	3	3	1.5
8	EI 693A / EI 693B/ EI 693C	PE	Power Electronics / Industrial Drives/ Robotics Engineering	0	0	3	3	1.5
9	CS(EI)695A / CS(EI)695B/ CS(EI)695C	OE	Data Structures & Algorithms Lab /Database Management System Lab / Software Engineering Lab	0	0	3	3	1.5
<b>C. PROJECT*</b>								
10	<b>Project Code</b>	<b>Project Name</b>		<b>Contact Hours /Week</b>				<b>Credit Points</b>
	EI 651	Process Control-I Project		1				0.5
	EI 652	Bio Medical Instrumentation Project		1				0.5
	EI 653A / EI 653B/ EI 653C	Power Electronics Project / Industrial Drives Project / Robotics Engineering Project		1				0.5
	EI654A/ EI654B/ EI654C	Artificial Intelligence Project / Non-Conventional Energy Sources Project / Analytical Instrumentation Project		1				0.5
	CS(EI)655A / CS(EI)655B/ CS(EI)655C	Data Structures & Algorithms Project / Database Management System Project /Software Engineering Project		1				0.5
<b>Total of Theory, Practical, Sessional &amp; Project</b>				<b>30</b>				<b>19.5+2</b>

\* Student need to select any four projects (Total Credit: 0.5+0.5+0.5+0.5=2)

7 <sup>th</sup> Semester								
Sl No	Paper Code		Theory	Contact Hours /Week				Credit Points
				L	T	P	Total	
<b>A. THEORY</b>								
1	HU702	HS	Values & Ethics in Profession	2	0	0	2	2
2	EI 701	PC	Telemetry and Remote Control	3	0	0	3	3
3	EI 702	PC	Process Control-II	3	0	0	3	3
4	CS(EI)703A / CS(EI )703B / CS(EI)703C	OE	Computer Networking/ Computer graphics and Multimedia / Object Oriented Programming	3	0	0	3	3
<b>Total of Theory</b>							<b>11</b>	<b>11</b>
<b>B. PRACTICAL</b>								
5	EI 791	PC	Telemetry and Remote Control Lab	0	0	3	3	1.5
6	CS(EI)793A / CS(EI)793B / CS(EI)793C	OE	Computer Networking Lab/ Multimedia Lab / Object Oriented Programming Lab	0	0	3	3	1.5
<b>C. SESSIONAL</b>								
7	EI794	PW	Individual Research Project I	0	0	8	8	4
8	EI 795	PW	Industrial Training / Internship		4 wks during 6th - 7th Sem-break			2
9	MC 791	MC	Technical Skill Development-III-	0	0	2	2	2units
<b>Total of Theory, Practical, Sessional &amp; Project</b>				<b>25</b>				<b>20</b>



8 <sup>th</sup> Semester								
Sl No	Paper Code		Theory	Contact Hours /Week				Credit Points
				L	T	P	Total	
<b>A. THEORY</b>								
1	HU805	HS	Industrial & Financial Management	2	0	0	2	2
2	EI801A/ EI801B/ EI801C	PE	Plant Automation/ Embedded System Design/ Virtual Instrumentation	3	0	0	3	3
3	EI 802A/ EI802B/ EI802C	PE	Mobile Communication/ VLSI & Microelectronics/ Mechatronics	3	0	0	3	3
<b>Total of Theory</b>							<b>8</b>	<b>8</b>
<b>B. PRACTICAL</b>								
4	EI 891	PC	Instrumentation & Control design Lab	0	0	6	6	3
<b>C. SESSIONAL</b>								
5	EI 882	PW	Individual Research Project II	0	0	12	12	6
6	EI883	PW	General Viva-voce	0	0	0	0	3
<b>Total of Theory, Practical, Sessional &amp; Project</b>				<b>26</b>				<b>20</b>

SEM	BS	HS	ES	PC	PE	IE	PW	XC	Total
SEM1	8.5	2	6					2units	16.5
SEM2	8.5	1	13.5					2units	23
SEM3	4		5.5	13.5				2units	23
SEM4	4.5	1		16.5				2units	22
SEM5		2		13.5	3		1.5	2units	20
SEM6				7.5	7.5	4.5		2units	19.5
SEM7		2		7.5		4.5	6	2units	20
SEM8		2		3	6		9		20
<b>Total</b>	<b>25.5</b> <b>15.54%</b>	<b>10</b> <b>6.09%</b>	<b>25</b> <b>15.24%</b>	<b>61.5</b> <b>38.10</b> <b>%</b>	<b>16.5</b> <b>10.06%</b>	<b>9</b> <b>5.48%</b>	<b>16.5</b> <b>10.00%</b>		<b>164</b>

**Total Mandatory Credit Point= 164+10 (Project Based Learning)**

**For Honors additional 10 Credit Point is to be earned (1<sup>st</sup> Sem to 8<sup>th</sup> Sem) through MOOCs courses. All the Certificates received by the students across all semester for MOOCs Courses from approved organization (Listed by AICTE / MAKAUT) is to be submitted to CoE office prior to 8<sup>th</sup> Semester Examination and the Credit earned through MOOCs courses will be reflected in their DGPA.**

Category	Total Credit	Percentage of Proposed curriculum (wrt 164)	As per AICTE (160)
Basic Sciences	25.5	15.54%	15 to 20%
Humanities & Social Sciences	10	6.09%	5 to 10%
Engineering Sciences and Skills	25	15.24%	15 to 20%
Professional Core	62.5	38.10%	30 to 40%
Professional Electives	16.5	10.06%	10 to 15%
Institutional Elective	9	5.48%	5 to 10%
Project work, seminar, internship	16.5	10.0%	10 to 15%
Total	164		

**Implementation Scheme of Mandatory Project Work:**

Semester	Credit	Number of papers to be assessed under mandatory project
1 <sup>st</sup>	1	Two (0.5 Credit per paper)
2 <sup>nd</sup>	1	Two (0.5 Credit per paper)
3 <sup>rd</sup>	2	Four (0.5 Credit per paper)
4 <sup>th</sup>	2	Four (0.5 Credit per paper)
5 <sup>th</sup>	2	Four (0.5 Credit per paper)
6 <sup>th</sup>	2	Four (0.5 Credit per paper)
Total	10	

**Mandatory Project Work  
For B.Tech Students from AY 2018-19  
(1<sup>st</sup> semester to 6<sup>th</sup> Semester)**

- a. Each Project Work will carry 0.5 Credit Point
- b. In the 1<sup>st</sup> and 2<sup>nd</sup> semester, students will do project work on any two subjects. The Choice of the subject on which a student wants to carry out his/her project work solely depends on the student. A Student can choose any 2 subjects of his/her own choice.
- c. In upper semesters like 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup>, the total credit allocation is 2 for each semester. Hence, a student will have to carry out 4 project works to score 2 credits
- d. In 7<sup>th</sup> and 8<sup>th</sup> Semester, there will be no separate project work like previous semesters, since they have Major Project Work with high credit point
- e. Each Project will have total 100 marks
- f. Below given Table shows the allocation of credit and marks:

Semester	Total Credit Point	No. of Project to be carried out (Choice Based)	Marks allocation in each project	Total Marks allocated in Project Works
<b>1<sup>st</sup> Year</b>				
1 <sup>st</sup> Semester	0.5+0.5=1.0	2	100	200
2 <sup>nd</sup> Semester	0.5+0.5=1.0	2	100	200
<b>2<sup>nd</sup> Year</b>				
3 <sup>rd</sup> Semester	1.0+1.0=2.0	4	100	400
4 <sup>th</sup> Semester	1.0+1.0=2.0	4	100	400
<b>3<sup>rd</sup> Year</b>				
5 <sup>th</sup> Semester	1.0+1.0=2.0	4	100	400
6 <sup>th</sup> Semester	1.0+1.0=2.0	4	100	400
<b>Total Credit</b>	<b>10</b>			

## Format for Project Work Evaluation (B.Tech)

College Name : Department :  
 Paper Name : Paper Code :  
 STREAM : Semester :

University Roll No.	Name of the Student	Title of the Project	Semester Examination								
			Project Report (10)	Development of Prototype/ Model (20)	Power point presentation (15)	Viva-Voce (15)	Usage of Modern Tool / Technology (10)	Innovativeness (10)	Individual contribution (10)	Group activity (10)	Total (100)

(Signature of the Project Supervisor(s))

(Signature of the HoD)

### Guidelines for execution of mandatory Project Work

1. Student will carry out project work on any two of the relevant papers in each semester of 1<sup>st</sup> year and any four of the relevant papers in each semester of 2<sup>nd</sup> and 3<sup>rd</sup> year.
2. Number of students under a given project would be decided by the Head of Dept. However, maximum number of students under a given project should not cross five.
3. Within one month of the commencement of the new semester, each student will identify and confirm the selection of subjects under which project works will be carried out and accordingly, continuous project work evaluation will be carried out by the respective supervisor
4. Credit point allocation on each project is 0.5
5. A 'Digital Repository' would be created about project work/presentation of a given student and same has to be maintained for all 4 years, so that the student can realize his/her gradual development with semesters.
6. In a semester, there would be at least two interim evaluation about the progress of project work (should be carried out along with Unit Tests I and II) followed by final assessment in the end semester examination.
7. 50% of the project will be evaluated by project guide and rest of 50% will be evaluated by external expert.(average value will be taken)

#### Assessment Guideline of Power Point Presentation (15):

- i) Body language (5 marks)    ii) Communication Skills (5 marks)    iii) Content of the power point presentation (5 marks)

# MOOCs Courses

## For B.Tech Students for AY 2018-19

### (1<sup>st</sup> Semester to 8<sup>th</sup> Semester)

Total Credit for MOOCs Subjects will be 10.

#### List of websites which offers online certification Courses

List of Websites which offers online certification courses:

1. Swayam- <https://swayam.gov.in/>
2. NPTEL- <https://onlinecourses.nptel.ac.in/>
3. Mooc- <http://mooc.org/>
4. Edx - <https://www.edx.org/>
5. Coursera- <https://www.coursera.org/>
6. Udacity - <https://in.udacity.com/>
7. Udemy - <https://www.udemy.com/>
8. Khanacademy - <https://www.khanacademy.org/>
9. Skillshare - <https://www.skillshare.com/>
10. Harvard University - <https://online-learning.harvard.edu/>
11. Ted - <https://ed.ted.com/>
12. Alison - <https://alison.com/>
13. Futurelearn - <https://www.futurelearn.com/>
14. Web Development - <https://digitaldefynd.com/best-free-web-development-courses-tutorials-certification/>
15. Digital Marketing - <https://digitaldefynd.com/best-free-digital-marketing-certifications/>
16. ios app development - <https://digitaldefynd.com/best-ios-app-development-course-tutorial/>
17. Open Learn - <http://www.open.edu/openlearn/>
18. Future Learn - <https://www.futurelearn.com/>
19. Tuts Plus - <https://tutsplus.com/>
20. Open Culture - <http://www.openculture.com/>

**For Honors additional 10 Credit Point is to be earned (1<sup>st</sup> Sem to 8<sup>th</sup> Sem) through MOOCs courses. All the Certificates received by the students across all semester for MOOCs Courses from approved organization (Listed by AICTE / MAKAUT) is to be submitted to CoE office prior to 8<sup>th</sup> Semester Examination and the Credit earned through MOOCs courses will be reflected in their DGPA.**