MINUTES OF MEETING
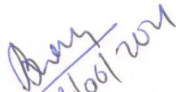
UG (Instrumentation & Control Engg.)

The internal BOS Meeting of the UG (Instrumentation & Control Engg.) held in the office of HOD (EIE) on dated 22nd June, 2021 at 10.00 A.M.

Agenda of the meeting was to select the subjects and finalize the syllabi for initiating the Minor Degree as well as Honors Degree.

The following members attended the meeting.

1.	Dr. Sanjay Marwaha, Professor	Chairman
2.	Dr. J.S. Dhillon, Professor	Member
3.	Dr. A.S. Arora, Professor	Member
4.	Dr. Surita Maini, Professor	Member
5.	Dr. Manpreet Kaur, Professor	Member
6.	Dr. Pratibha Tyagi, Assoc. Professor	Member
7.	Er. Asim Ali Khan, Associate Professor	Member
8.	Er. Sunil Kumar Bansal, Asstt. Profesor	Member
9.	Er. Barasha Mali, Asstt. Professor	Member

Prof. Manpreet Kaur, who was assigned task to propose subjects of Minor and Honor's degree put up the proposal for deliberation in BOS. After brain storming discussion the scheme for Minor Degree as well as Honors Degree (as enclosed) was finalized with mutual consensus.
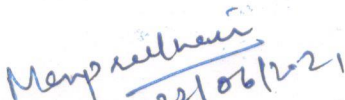
Barasha Mali   Sunil K Bansal   Asim Ali Khan   Dr. Pratibha Tyagi
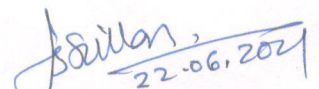
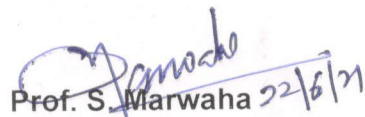Prof. Manpreet   Prof. Surita Maini   Prof. A.S. Arora   Prof. J.S. Dhillon
Kaur

Prof. S. Marwaha
Chairman

Course Scheme for Under Graduate Programme in Instrumentation & Control Engineering

Department of Electrical & Instrumentation Engineering

Sant Longowal Institute of Engineering & Technology
Longowal-148106
Phone: 01672-253119/253120 Fax: 01672-280057
Website: www.sliet.ac.in

Vision of Department

Electrical and Instrumentation Engineering Department shall strive to act as a podium for the development and transfer of technical competence in academics, entrepreneurship and research in the field of Electrical and Instrumentation Engineering to meet the changing need of society.

MISSION

1. To provide modular programmes from skill development to the research level.
2. To impart education and training in innovative state-of-the-art technology in the field of Electrical and Instrumentation Engineering.
3. To promote holistic development among the students.
4. To provide extension services to rural society, industry professionals, institutions of research and higher learning in the field of Electrical and Instrumentation Engineering.
5. To interact with the industry, educational and research organizations, and alumni in the fields of curriculum development, training and research for sustainable social development and changing needs of society.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO):

The following Programme Educational Objectives are designed based on the department mission. The graduates of Instrumentation and Control Engineering should be able to demonstrate

1. skill in professional / academic career using the knowledge of mathematical, scientific and engineering principles.
2. expertise in solving real life problems, designing innovative products and systems that are techno-economically and socially sustainable.
3. sustained learning and adaptation to modern engineering tools, techniques and practices through instruction, group activity and self-study.
4. leadership and team work while working with diverse multidisciplinary / interdisciplinary groups.
5. professional ethics and commitment to organizational goals.

PROGRAM OUTCOMES

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4 **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5 **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6 **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7 **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8 **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9 **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10 **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11 **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12 **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSO)

1 Understand and analyze the existing techniques for measurement, instrumentation, process control and automation in real-time problems.

2 Develop innovative solutions for measurement, instrumentation, control and automation of real- time applications by utilizing the latest technological developments.

Study Scheme for Bachelor of Engineering in Instrumentation and Control (GIN)

Semester-I Group-A (GIN)

S. No.	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	BSMA-401	Engineering Mathematics I	3	1	0	4	4
2	BSPH-401	Applied Physics	3	1	0	4	4
3	ESEE-401	Elements of Electrical Engineering	2	1	0	3	3
4	ESCS-401	Elements of Computer Engineering	2	0	0	2	2
5	ESEC-401	Elements of Electronics Engineering	2	0	0	2	2
6	BSPH-402	Applied Physics Lab	0	0	2	2	1
7	ESEE-402	Elements of Electrical Engineering Lab	0	0	2	2	1
8	ESCS-402	Elements of Computer Engineering Lab	0	0	4	4	2
9	ESEC-402	Elements of Electronics Engineering Lab	0	0	2	2	1
		Total	12	03	10	25	20

Semester-II A Group-A (GIN)

S. No.	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	BSMA-402	Engineering Mathematics II	3	1	0	4	4
2	BSCH-401	Applied Chemistry	3	1	0	4	4
3	ESME-401	Elements of Mechanical Engineering	2	1	0	3	3
4	ESME-402	Workshop Technology and Practice	1	0	0	1	1
5	HSMC-401	English Communication and Soft Skills	1	0	0	1	1
6	BSCH-402	Applied Chemistry Lab	0	0	2	2	1
7	ESME-403	Elements of Mechanical Engineering Lab	0	0	2	2	1
8	ESME-404	Engineering Drawing	0	0	4	4	2
9	ESME-405	Workshop Technology and Practice Lab	0	0	4	4	2
10	HSMC-402	English Communication and Soft Skills Lab	0	0	2	2	1
11	MCCH-401	Mandatory Course-1	3	0	0	3	0
		Total	13	03	14	30	20

Semester-II B Group-A (GIN)

S. No.	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	TPIN-421	Practical Training During Summer Vacations (In-house) 02 weeks				40	1 (S/US)
2	TPIN-422	Technical Competency				40	1 (S/US)

Semester-III Group-A (GIN)

S. No.	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	BSMA-501	Numerical and Statistical Methods	3	0	0	3	3
2	PCIE-511	Electrical Circuit Analysis and Synthesis	3	1	0	4	4
3	PCIE-512	Electronic Devices and Analog Integrated Circuits	3	1	0	4	4
4	PCIE-513	Electrical and Electronic Measurement	3	1	0	4	4
5	BSBL-501	Biology for Engineers	2	0	0	2	2
6	BSMA-502	Numerical and Statistical Methods Lab	0	0	2	2	1
7	PCIE-514	Electronic Devices and Analog Integrated Circuits Lab	0	0	2	2	1
8	PCIE-515	Electrical and Electronic Measurement Lab	0	0	2	2	1
		Total	14	03	06	23	20

Semester-IV –A Group-A (GIN)

S. No.	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	ESME-501	Engineering Mechanics	3	1	0	4	4
2	PCIE-521	Digital Electronics	3	0	0	3	3
3	PCIE-522	Sensors and Transducers	3	1	0	4	4
4	PCIE-523	Signals and Systems	3	1	0	4	4
5	HSMC-501	Principles of Management	3	0	0	3	3
6	PCIE-524	Digital Electronics Lab	0	0	2	2	1
7	PCIE-525	Sensors and Transducers Lab	0	0	2	2	1
8	MCMH-501	Mandatory Course-2	3	0	0	3	0
		Total	18	3	4	25	20

Semester-IV-B Group-A (GIN)

1	TPID-521	Industrial Training 02 weeks				40	1 (S/US)
2	EAA-521+	Fractional credit course/Extra Academic Activity +GROUP A/B/C				40	1 (S/US)

Semester-V-A Group-A (GIN)

S No.	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	PCIE-611	Analytical and Optical Instrumentation	3	0	0	3	3
2	PCIE-612	Control Systems	3	1	0	4	4
3	OEXX-611	Open Elective-1	3	0	0	3	3
4	OEXX-612	Open Elective-2	3	0	0	3	3
5	PEIE-611	Professional Elective-1	3	0	0	3	3
6	HSMC-601	Technical Communication	2	0	0	2	2
7	PCIE-613	Control System Lab	0	0	2	2	1
8	HSMC-602	Technical Communication Lab	0	0	2	2	1
		Total	17	1	4	22	20

Semester-V-B Group-A (GIN)

1	EAA-611+	Fractional credit course/Extra Academic Activity +GROUP A/B/C				40	1(S/US)

Semester-VI-A Group-A (GIN)

S No.	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	PCIE-621	Microprocessors and Microcontrollers	3	1	0	4	4
2	PCIE-622	Industrial Instrumentation	3	0	0	3	3
3	OEXX-621	Open Elective-3	3	0	0	3	3
4	OEXX-622	Open Elective-4	3	0	0	3	3
5	PEIE-621	Professional Elective-2	3	0	0	3	3
6	HSMC-603	Engineering Economics and Entrepreneurship	3	0	0	3	3
7	PCIE-623	Microprocessors and Microcontrollers Lab	0	0	2	2	1
		Total	18	1	2	21	20

Semester-VI-B Group-A (GIN)

1	TPID-621	Industrial Training 04 weeks				40	2 (S/US)
2	EAA-622+	Fractional credit course/Extra Academic Activity +GROUP A/B/C				40	1 (S/US)

		Semester-VII Group-A (GIN)					
S No.	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	PCIE-711	Process Dynamics and Control	3	1	0	4	4
2	PCIE-712	Data Communication and Networking	3	1	0	4	4
3	PEIE-711	Professional Elective-3	3	0	0	3	3
4	PEIE-712	Professional Elective-4	3	0	0	3	3
5	OEXX-711	Open Elective-5	3	0	0	3	3
6	PCIE-713	Process Dynamic and Control Lab	0	0	2	2	1
7	PRIE-711	Project Stage I and Seminar	0	0	4	4	2
		Total	15	2	6	23	20

		Semester-VIII Group-A (GIN)					
S No.	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	PEIE-721	Professional Elective-5	3	0	0	3	3
2	PEIE-722	Professional Elective-6	3	0	0	3	3
3	PRIE-721	Project Stage II	0	0	12	12	6
		Total	6	0	12	18	12
		OR					
S No.	Sub Code	Subject Name	L	T	P	Hrs.	Credits
1	INID-721	Internship in Industry				40	6
2	PRIE-721	Project Stage II	0	0	12	12	6
		Total					12

List of Mandatory Courses

1. **MCCH-401 Mandatory Course – 1:** Environmental Studies
2. **MCMH-501 Mandatory Course – 2:** Indian Constitution

List of Open Electives

LIST OF OPEN ELECTIVES							
S. No.	Sub. Code	Subject Name	L	T	P	Hrs.	Credits
1	**OEIE-611**	**Open Elective-I**	3	0	0	3	3
a)	OEIE-611A	Electrical Circuits	3	0	0	3	3
b)	OEIE-611B	Electrical Engineering Materials	3	0	0	3	3
c)	OEIE-611C	Renewable Energy Sources	3	0	0	3	3
d)	OEIE-611D	Optical Instrumentation	3	0	0	3	3
e)	OEIE-611E	Hydraulics and Pneumatics	3	0	0	3	3
2	**OEIE-612**	**Open Elective-II**	3	0	0	3	3
a)	OEIE-612A	Energy Conservation Practices	3	0	0	3	3
b)	OEIE-612B	Energy Auditing and Management	3	0	0	3	3
c)	OEIE-612C	Power Plant Engineering	3	0	0	3	3
d)	OEIE-612D	Virtual Instrumentation	3	0	0	3	3
e)	OEIE-612E	Nuclear Instrumentation	3	0	0	3	3
3	**OEIE-621**	**Open Elective-III**	3	0	0	3	3
a)	OEIE-621A	Microprocessors and Applications	3	0	0	3	3
b)	OEIE-621B	Elements of Power System	3	0	0	3	3
c)	OEIE-621C	Biomedical Instrumentation	3	0	0	3	3
d)	OEIE-621D	Building Automation	3	0	0	3	3
e)	OEIE-621E	Image and Video Processing	3	0	0	3	3
4	**OEIE-622**	**Open Elective-IV**	3	0	0	3	3
a)	OEIE-622A	Control System	3	0	0	3	3
b)	OEIE-622B	Microcontrollers and Applications	3	0	0	3	3
c)	OEIE-622C	Industrial Safety Engineering	3	0	0	3	3
d)	OEIE-622D	Speech and Audio Processing	3	0	0	3	3
e)	OEIE-622E	Artificial Intelligence	3	0	0	3	3
5	**OEIE-711**	**Open Elective-V**	3	0	0	3	3
a)	OEIE-711A	Signals and Systems	3	0	0	3	3

b)	OEIE-711B	Sensors and Transducers	3	0	0	3	3
c)	OEIE-711C	Introduction to Soft Computing	3	0	0	3	3
d)	OEIE-711D	Process Control	3	0	0	3	3
e)	OEIE-711E	Environmental Instrumentation	3	0	0	3	3

List of Professional Electives

S. No.	Sub. Code	Subject Name	L	T	P	Hrs.	Credits
		List of Professional Electives					
1	PEIE-611	**Professional Elective-1**	3	0	0	3	3
a)	PEIE-611A	Biomedical Instrumentation	3	0	0	3	3
b)	PEIE-611B	Electrical Machines	3	0	0	3	3
c)	PEIE-611C	Industrial Safety	3	0	0	3	3
2	PEIE-621	**Professional Elective-2**	3	0	0	3	3
a)	PEIE-621A	Biomedical Signal and Image Processing	3	0	0	3	3
b)	PEIE-621B	Power Electronics and Drives	3	0	0	3	3
c)	PEIE-621C	Telemetry and Data Acquisition	3	0	0	3	3
3	PEIE-711	**Professional Elective-3**	3	0	0	3	3
a)	PEIE-711A	Wind and Solar Energy Systems	3	0	0	3	3
b)	PEIE-711B	Telemedicine and Robotic-Surgery	3	0	0	3	3
c)	PEIE-711C	Non-Linear and Optimal Control	3	0	0	3	3
4	PEIE-712	**Professional Elective-4**	3	0	0	3	3
a)	PEIE-712A	Digital Signal Processing	3	0	0	3	3
b)	PEIE-712B	Optimization Techniques	3	0	0	3	3
c)	PEIE-712C	Virtual Instrumentation	3	0	0	3	3
5	PEIE-721	**Professional Elective-5**	3	0	0	3	3
a)	PEIE-721A	Robotics	3	0	0	3	3
b)	PEIE-721B	Computer Control of Processes	3	0	0	3	3
c)	PEIE-721C	Introduction to MEMs	3	0	0	3	3
6	PEIE-722	**Professional Elective-6**	3	0	0	3	3
a)	PEIE-722A	Advanced Microprocessors and Microcontrollers	3	0	0	3	3
b)	PEIE-722B	Power Plant Instrumentation	3	0	0	3	3
c)	PEIE-722C	Modelling and Simulation	3	0	0	3	3

S. No.	Course Components	Curriculum content(% of total number of the credits of the program)	Total number of contact hours	Total number of credits
1	Basic Sciences	15	27	24
2	Engineering Sciences	15	33	24
3	Humanities and Social Sciences	6.875	13	11
4	Program Core	32.5	59	52
5	Program Electives	7.5	12	12
6	Open Electives	9.375	15	15
7	Project	3.75	12	6
8	Internship/Seminar/Industrial Training	8.125	204	13
9	Any other (Mandatory course and fractional credit course)	1.875	126	3
	Total number of Credits			160

List of courses for B.E (Minor) Program in Instrumentation and Control Engineering

S No	Subject Code	Subject Name	L	T	P	Hrs	Credits
Semester III							
1	MDIE-511	Transducers and Signal Processing	3	1	0	4	4
Semester IV							
1	MDIE-521	Data Acquisition System	3	1	0	4	4
Semester V							
1	MDIE-611	Automatic Control System	3	1	0	4	4
Semester VI							
1	MDIE-621	Industrial Measurements	3	1	0	4	4
Semester VII							
1	MDIE-711	Industrial Automation	3	1	0	4	4

List of advanced level courses for B.E(Honours) in Instrumentation and Control Engineering

S No	Subject Code	Subject Name	L	T	P	Hrs	Credits
		Semester V					
1	HDIE-611	Advanced Sensors	3	1	0	4	4
2	HDIE-612	Random and Stochastic Process	3	1	0	4	4

S No	Subject Code	Subject Name	L	T	P	Hrs	Credits
		Semester VI					
1	HDIE-621	Wireless Sensor Networks	3	1	0	4	4

S No	Subject Code	Subject Name	L	T	P	Hrs	Credits
		Semester VII					
1	HDIE-711	Internet Of Things and Its Applications	3	1	0	4	4

S No	Subject Code	Subject Name	L	T	P	Hrs	Credits
		Semester VIII					
1	PHIE-721	Project Honours	0	0	8	8	4