

**Institute of Instrumentation Engineering**  
**Kurukshetra University Kurukshetra**  
(formerlyUSIC)

University Science Instrumentation Centre (USIC) was established in 1976 by UGC initially as a Central Instrumentation facility at Kurukshetra University. Recently the name of the department has been changed as Institute of Instrumentation Engineering withUSIC remaining as one of the constituents of the IIE. In 1995 for the first time in Haryana region AICTE approved 4-year B.Tech(Instrumentation) course was started and in the year 2006 M.Tech (Instrumentation) was started.

In the Institute there are 1Professor, 2 Readers and 8 Lecturers as a faculty. 4 teachers hold Ph.D. degree, 1 have done M.Phil,6 M.Tech and 3 are NET/SLET qualified. They have long teaching and research experience and have the expertise in their field..

**Vision**

To develop the Institute as a Centre of Excellence in learning and teaching for generating trained manpower of the highest quality comparable to the very best in the world and inculcating entrepreneurial avenues to cater to the needs of industry and society at large for sustainable national growth. The Institution also focuses towards strengthening the R & D activities to facilitate technology transfer for betterment of community as a whole including Tribal Development Program and to become a major supplier of technology and technological services at National and International Level

**Director:**  
**Contact information**  
**Email:**

Dr. Sunil Dhingra  
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sdhingra\_kuk@yahoo.com

## Faculty Information

S.No.	Name (s) of the Teaching Faculty	Designation	Specialization	Date of Joining the Institution	Contact
1	Dr.Sunil Dhingra M.Sc.,Ph.D., LL.B.	Director	Electronic and Embedded system	1996	09416362401
2	Dr. V.M.Murthy M.Sc.,M.Tech,Ph.D.,	Reader	Remote sensing	1996	09416822374
3	Sh. Pardeep Kr. M.Sc.,M.Phil.	Lecturer	Computer Network	1995	09416412803
4	Sh.D.S.Rana M.Sc.,M.Tech	Lecturer	Process control instrumentation	1995	01744239739
5	Dr. C.Srinivas M.Sc.,M.Tech, Ph.D.	Lecturer	Computational fluid dynamics	1996	09896894481
6	Sh.Jai Pal Saroha B.Tech, M.Tech	Lecturer	Power system Engg. Communication Engg.	2003	09896076022
7	Sh.Avnes Verma B.Tech, M.Tech	Lecturer	Power Electronics, Bio-medical Instt.	2004	09416481652
8	Sh.Bhanu Partap B.Tech, M.Tech	Lecturer	Electrical (Control systems)	2004	09315679363
9	Sh.Surender Singh B.Tech, M.Tech	Lecturer	Power system engg. Digital signal processing	2004	09896895190
	Faculty under self financing				
1	D.K..Chaturvedi Ph.D.	Professor	Condensed Matter	1986	09896014243
2	Sh.Gagan Deep B.Tech, M.Tech	Lecturer	Instrumentation	2006	09992013130

## Courses Offered

### B Tech Instrumentation Engineering

System of Exam.: Semester system  
Credit based examination (Grading system)  
w.e.f. 2007-08

### M Tech Instrumentation

system of exam : Semester System  
Credit based examination (Grading system)  
w.e.f. 2007-08

### Profile of courses Offered

**Degree type Course Duration No of sanctioned seats Scheme of exam**

B. Tech 4 year 60 (w.e.f. 2008-09) Semester system  
 M Tech 2 year 20 Semester system

### SCHEME OF EXAMINATIONS B.Tech Instrumentation

#### B.Tech. 1<sup>ST</sup> YEAR (SEMESTER-I) (2007-2008)

Course No.	Course title	Credits	Teaching Schedule				Allotment of marks				Duration of Exams
			L	T	P	Total	Minor test + Curricular activities	Major test	Practical	Total	
INMA01	Mathematics-I	4.5	4	1	--	5	45 + 15	90	--	150	3
INPH02	Physics-I	3.5	3	1	--	4	45 + 15	90	--	150	3
INCH03	Chemistry	3.5	3	1	--	4	45 + 15	90	--	150	3
IN104	Elements of Instrumentation	3.5	3	1	--	4	45 + 15	90	--	150	3
INHU05	Engineering OR Communication Skills in English	3.5	3	1	--	4	45 + 15	90	--	150	3
INME06 / INCE07 / INEL08 / INME09	Elements of Mechanical Engineering / Elements of Civil Engg./ Elements of Electronics Engg. * OR Manufacturing process	3.5 / 4	3 / 4	1 / --	-- / --	4 / 4	30 + 10 / 45 + 15	60 / 90	-- / --	100 / 150	3 / 3
INCS10	Fundamentals of Computer & Programming in C	3.5	3	1	--	4	45 + 15	90	--	150	3
INEE11	OR Electrical Technology	3.5	3	1	--	4	45 + 15	90	--	150	3
INES12	Environmental Studies**	0	4	-		4	30 + 10	60	--	100	3
PRPH13	Physics Lab.-I	1	-	-	2	2	20	--	30	50	3
PRME14	Workshop	1.5	--	--	3	3	20	--	30	50	3

PRME15	Practice OR Elements of Engg. Graphics and Drawing	1.5	--	--	3	3	20	--	30	50	3
PRCH16 PREE17	Chemistry Lab. OR Electrical Technology Lab.	1.0 1.0	-- --	-- --	2 2	2 2	20 20	-- --	30 30	50 50	3 3
PRME18/ PRCE19 / PREL20 PRCS21	Elements of Mechanical Engineering / Elements of Civil Engg./ Elements of Electronics Engg. * OR Computer Programming Lab.	1.0 1.0	-- --	-- --	2 2	2 2	20 20	-- --	30 30	50 50	3 3
	Total	26.5/27	23/24	6/5	9/9	38/38	460/ 480	570/ 600	120/ 120	1150/ 1200	

**B.Tech. 1<sup>ST</sup> YEAR (SEMESTER–II) (2007-2008)**

Course No.	Course title	Credits	Teaching Schedule				Allotment of marks				Duration of Exams
			L	T	P	Total	Minor test + Curricular activities	Major test	Practical	Total	
INMA22	Mathematics-II	4.5	4	1	--	5	45 + 15	90	--	150	3
INPH23	Physics-II	3.5	3	1	--	4	45 + 15	90	--	150	3
IN104	Elements of Instrumentation Engineering	3.5	3	1	--	4	45 + 15	90	--	150	3
INHU05	OR Communication Skills in English	3.5	3	1	--	4	45 + 15	90	--	150	3
INME06/ INCE07/ INEL08 INME09	Elements of Mechanical Engineering / Elements of Civil Engg./ Elements of Electronics Engg. * OR Manufacturing process	3.5 4	3 4	1 --	-- --	4 4	30 + 10 45 + 15	60 90	-- --	100 150	3 3
INCS10	Fundamentals of Computer & Programming in C	3.5	3	1	--	4	45 + 15	90	--	150	3
INEE11	OR Electrical Technology	3.5	3	1	--	4	45 + 15	90	--	150	3
PRPH24	Physics Lab.-II	1	-	-	2	2	20	--	30	50	3

PRME 14	Workshop Practice	1.5	--	--	3	3	20	--	30	50	3
PRME 15	OR Elements of Engg. Graphics and Drawing	1.5	--	--	3	3	20	--	30	50	3
PRCH 16	Chemistry Lab.	1.0	--	--	2	2	20	--	30	50	3
PREE1 7	OR Electrical Technology Lab.	1.0	--	--	2	2	20	--	30	50	3
PRME 18/ PRCE1 9/ PREL2 0 PRCS2 1	Elements of Mechanical Engineering / Elements of Civil Engg./ Elements of Electronics Engg. * OR Computer Programming Lab.	1.0	--	--	2	2	20	--	30	50	3
		1.0	--	--	2	2	20	--	30	50	3
	Total	23./ 23.5	16/ 17	5/4	9 / 9	30/ 30	380/ 400	450/ 480	120 / 120	900/ 950	

- Note:-
1. Students will study either Group A (IN104, INME06/INCE07/ INEL08, INCS10, PRME14, PRCH16, PRME18/ PRCE19/PREL20) OR Group B (INHU05, INME09, INEE11, PRME15, PREE17, PRCS21) courses to be decided by the Department.
  2. Practical Examination will consist of 10 marks for viva-voce and 15 marks for Experiment.
- \* Institutes will offer one of these electives  
\*\* Subject is qualifying. It shall carry 25 sessional marks for field work (to be conducted by the institute) report.

B.Tech. Instrumentation  
Scheme of Examination 2nd Year Course

Course No.	Course title	Credits	SEMESTER – III Teaching Schedule				Total	Allotment of marks			Duration of Exams.
			L	T	P	Minor test + Curricular activities		Major test	Practical	Total	
IN-HUM 201E	Basics of Industrial Sociology, Economics and Management	3.5	3	1	--	4	45 + 15	90	--	150	3 hrs
IN2301	Measurement Techniques & Theory of Errors	3.5	3	1	--	4	45 + 15	90	--	150	3 hrs
IN2302	Network Analysis	3.5	3	1	--	4	45 + 15	90	--	150	3 hrs
IN2303	Transducers and Applications	3.5	3	1	--	4	45 + 15	90	--	150	3 hrs

IN2304	Linear Integrated Circuits	3.5	3	1	--	4	45 + 15	90	--	150	3 hrs
IN2305	Digital Techniques	3.5	3	1	--	4	45 + 15	90	--	150	3 hrs
PR2306	Transducers Lab.	1.5	--	-	3	3	20	--	30	50	3 hrs
PR2307	Network Analysis Lab.	1	--	-	2	2	20	--	30	50	3 hrs
PR2308	Digital Techniques Lab.	1.5	--	-	3	3	30	--	45	75	3 hrs
PR2309	Linear Integrated Circuits Lab.	1.5	--	-	3	3	30	--	45	75	3 hrs
	Total	26.5	18	6	11	35	460	540	150	1150	

Course No.	Course title	Credits	SEMESTER – IV Teaching Schedule				Total	Allotment of marks			Total	Duration of Exams.
			L	T	P	Minor test + Curricular activities		Major test	Practical			
IN2401	Maths-III	3.5	3	1	--	4	45 + 15	90		150	3 hrs	
IN2402	Power Electronics-I	3.5	3	1	--	4	45 + 15	90		150	3 hrs	
IN2403	Microprocessor	3.5	3	1	--	4	45 + 15	90		150	3 hrs	
IN2404	Control System Components	3.5	3	1	--	4	45 + 15	90		150	3 hrs	
IN2405	Electrical Machines	3.5	3	1	--	4	45 + 15	90		150	3 hrs	
IN2406	Computer Organization	3.5	3	1	--	4	45 + 15	90		150	3 hrs	
PR2407	Control System Lab. - I	1.5	--	-	3	3	30	--	45	75	3 hrs	
PR2408	Power Electronics Lab. -I	1.5	--	-	3	3	20	--	30	50	3 hrs	
PR2409	Microprocessor Lab. - I	1.5	--	-	3	3	30	--	45	75	3 hrs	

PR2410	Simulation Lab. – I	1.5	--	-	2	2	20	--	30	50	3 hrs
	Total	27	18	6	11	35	460	540	150	1150	

B.Tech. Instrumentation  
Scheme of Examination 3rd Year Course

SEMESTER – V

Course No.	Course title	Teaching Schedule				Allotment of marks			Total	Duration of Exams.
		L	T	P	Total	Sessional	Theory	Practical		
IN-3501	Power Electronics-II	3	1	--	4	50	100	--	150	3 hrs
IN-3502	Analytical Instrumentation	3	1	--	4	50	100	--	150	3 hrs
IN-3503	Microprocessor Based Instrumentation	4	1	--	5	50	100	--	150	3 hrs
IN-3504	Communication Engineering & Signals & Systems	3	1	--	4	50	100	--	150	3 hrs
IN-3505	Linear Automatic Control System	4	1	--	5	50	100	--	150	3 hrs
PR3506	Advanced Microprocessor Lab.	--	-	3	3	30	--	45	75	3 hrs
PR3507	Soft computing lab.	--	-	3	3	20	--	30	50	3 hrs
PR3508	Power Electronics Lab.II	--	-	2	2	20	--	30	50	3 hrs
PR3509	Control system lab.			3	3	30	--	45	75	3 hrs
PR3510	Industrial Training ** (Viva-Voce)	--	-	--	--	30	--	70	100	3 hrs
	Total	17	5	11	33	380	500	320	1100	

\*\* 4-6 weeks hand on training to be done after IVth Sem. Exams.

SEMESTER – VI

Course No.	Course title	Teaching Schedule				Allotment of marks			Total	Duration of Exams.
		L	T	P	Total	Sessional	Theory	Practical		
IN3601	Communication Systems	3	1	--	4	50	100	--	150	3 hrs
IN3602	Fuzzy logic control	3	1	--	4	50	100	--	150	3 hrs
IN3603	Digital Signal Processing	3	1	--	4	50	100	--	150	3 hrs
IN3604	Instrument & System Design	3	1	--	4	50	100	--	150	3 hrs
IN3605	Micro-controller & Embedded systems	3	1	--	4	50	100	--	150	3 hrs
PR3606	Microcontroller Lab.	--	-	3	3	30	--	45	75	3 hrs
PR3607	Signal Processing Lab.	--	-	3	3	30	--	45	75	3 hrs
PR3608	Communication Engg. Lab.			2	2	20	--	30	50	3 hrs
PR3609	Project Work	--	-	5	5	30	--	70	100	3 hrs

(Seminar)	-								
Total	15	5	13	33	360	500	190	1050	

B.Tech. Instrumentation  
Scheme of Examination 4th Year Course  
SEMESTER – VII

Course No.	Course title	Teaching Schedule				Allotment of marks				Duration of Exam
		L	T	P	Total	Sessional	Theory	Pract	Total	
IN4701	Optional - I*	4	1	--	4	50	100	--	150	3 hrs
IN4702	Biomedical Instrumentation	4	1	--	5	50	100	--	150	3 hrs
IN4703	Computer Graphics & CAD CAM	4	1	--	5	50	100	--	150	3 hrs
IN4704	Advance Process dynamics and Control	4	1	--	5	50	100	--	150	3 hrs
PR4705	Option – I Lab.	--	-	3	3	30	--	45	75	3 hrs
PR4706	Computer Graphics & CAD CAM Lab.	--	-	3	3	30	--	45	75	3 hrs
PR4707	Simulation lab.II	--	-	2	2	20	--	30	50	3 hrs
PR4708	Project Work (Case Study)	--	-	5	5	30	--	70	100	3 hrs
PR4709	Industrial Training **(Viva-Voce)	--	-	--	--	30	--	70	100	3 hrs
	Total	16	4	13	32	340	400	260	1000	

\*\* 6-8 week hand on training to be done after VIth Sem. Exams.

Optional - I\*

- i. Flight Instrumentation
- iii. Power Plant Instrumentation
- v. Artificial Intelligence
- vii. Instrumental Methods of Analysis
- ix. Computer Controlled Instrumentation
- xi. Inertial Navigation & Control
- xiii. Advance Control System
- xv. Pneumatic and Hydraulic Instrumentation and Fluidics

Optional- II\*

- ii. Nuclear Instrumentation
- iv. Remote Sensing
- vi. Robotics
- viii. Environmental Instrumentation and Safety
- x. Optical Instrumentation
- xii. Safety and Reliability
- xiv. Computer Control of Systems
- (iv) Parallel Process & real Time Operating System

\* Option to be offered will be decided by the department each year depending on the facilities available.

SEMESTER – VIII

Course No.	Course title	Teaching Schedule				Allotment of marks				Duration of Exams.
		L	T	P	Total	Sessional	Theory	Pract.	Total	
IN4801	Optional - II*	4	1	--	5	50	100	--	150	3 hrs
IN4802	Project Planning Estimation & Assessment	3	1	--	4	50	100	--	150	3 hrs
IN4803	Engineering Materials	4	1	--	4	50	100	--	150	3 hrs
IN4804	Industrial Process Control	4	1	--	5	50	100	--	150	3 hrs
PR4805	Option – II Lab.	--	-	4	4	30	--	45	75	3 hrs

PR4806	Process control Lab			4	4	30	--	45	75	3 hrs
PR4807	Project Work	--	-	6	6	50	--	100	150	3 hrs
	(Major-Seminar)			-						
	Total	15	4	14	32	310	400	190	900	3 hrs

Optional - I\*

- i. Flight Instrumentation
- iii. Power Plant Instrumentation
- v. Artificial Intelligence
- vii. Instrumental Methods of Analysis
- ix. Computer Controlled Instrumentation
- xi. Inertial Navigation & Control
- xiii. Advance Control System
- xv. Pneumatic and Hydraulic Instrumentation and Fluidics

Optional- II\*

- ii. Nuclear Instrumentation
- iv. Remote Sensing
- vi. Robotics
- viii. Environmental Instrumentation and Safety
- x. Optical Instrumentation
- xii. Safety and Reliability
- xiv. Computer Control of Systems
- (iv) Parallel Process & real Time Operating System

\* Option to be offered will be decided by the department each year depending on the facilities available.

## Scheme for M.Tech. Instrumentation Engineering w.e.f. 2007-08

### Semester 1

Code	Subject Name	L	T	P	Minor test+ curricular activities	Major test	Practical	Total	Credits
IE-1101	System Theory	3	1	0	30 + 10	60	-	100	<u>3.5</u>
IE-1102	Microcontroller & Embedded System	3	1	0	30 + 10	60	-	100	3.5
IE-1103	Transducers, Signal Conditioning, Transmission & Display	3	1	0	30 + 10	60	-	100	3.5
IE-1104	Advance Process Control	3	1	0	30 + 10	60	-	100	3.5
IEP-1105	Embedded System & Control Lab	0	0	6	40	-	60	100	<u>3</u>
IEP1106	Transducers Lab	0	0	4	40	-	60	100	<u>2</u>
	<b>Total</b>	<b>12</b>	<b>4</b>	<b>10</b>	<b>240</b>	<b>240</b>	<b>120</b>	<b>600</b>	<b>19</b>

### Semester 2

Code	Subject Name	L	T	P	Minor test+ curricular activities	Major test	Practical	Total	Credits
IE-1201	Biomedical Instrumentation	3	1	0	30 + 10	60	-	100	<u>3.5</u>
IE-1202	PLC & DCS	3	1	0	30 + 10	60	-	100	3.5
IE-1203	Digital Signal Processing	3	1	0	30 + 10	60	-	100	3.5
IE-1204E	Elective-I	3	1	0	30 + 10	60	-	100	3.5
IEP-1205	Digital Signal Processing Lab.	0	0	4	40	-	60	100	<u>2</u>
IEP-1206	Process control & Instrumentation Lab.	0	0	6	40	-	60	100	<u>3</u>
	<b>Total</b>	<b>12</b>	<b>4</b>	<b>10</b>	<b>240</b>	<b>240</b>	<b>120</b>	<b>600</b>	<b>19</b>

### Semester 3

Code	Subject Name	L	T	P	Minor test+ curricular activities	Major test	Practical	Total	Credits
IE-2301	Smart & Micro Sensor Design	3	1	0	30 + 10	60	-	100	<u>3.5</u>
IE-2302E	Elective 2	3	1	0	30 + 10	60	-	100	<u>3.5</u>
IEP-2303	Instrumentation Lab.	0	0	6	40	-	60	100	<u>3</u>
SEM-2301	Current Literature Report & Seminar	0	0	10	50	-	-	50	<u>2</u>
	<b>Total</b>	<b>6</b>	<b>2</b>	<b>16</b>	<b>170</b>	<b>120</b>	<b>60</b>	<b>350</b>	<b>12</b>

#### Semester 4

Code	Subject Name	Hours per week			Credits
		L	T	p	
IE-2401	Dissertation	0	0	20	10

Students can choose Elective 1 and Elective 2 from the following list of electives. The option to be offered, however, will be decided by the department each year depending on the facilities available.

#### List of Electives 1

- IE-1204E(i) -- Industrial Environment Engineering
- IE-1204E(ii) -- Process Modeling and Control
- IE-1204E(iii) -- Instrumentation System Design
- IE-1204E(iv) -- Power Plant Instrumentation
- IE-1204E(v) -- Industrial Electronics
- IE-1204E(vi) -- Analytical instrumentation
- IE-1204E(vii) -- Intelligent Instrumentation*
- IE-1204E(viii) -- Process Equipment design
- IE-1204E(ix) -- Remote sensing and image processing

#### List of Electives 2

- IE-2302E(i) -- Parameter Estimation & System Identification
- IE-2302E(ii) -- Theory and Design of Neuro fuzzy controllers
- IE-2302E(iii) -- Digital Control System
- IE-2302E(iv) -- Control system Design
- IE-2302E(v) -- Research Methodology
- IE-2302E(vi) -- Energy Management
- IE-2302E(vii) -- Optimization Techniques
- IE-2302E(viii) -- Nonlinear and Multivariable Control Systems
- IE-2302E(ix) -- Optimal Control System

#### N.B

1. The syllabus for each theory paper will contain four units and examiner will set eight questions by selection two questions from each unit. The student will answer any five questions in all, selecting at least one from each unit
2. The Internal assessment in each theory paper will be 40 marks of which 30 marks will be assigned on the basis of two written test and 10 marks will be assigned on the basis of curricular activities.
3. Dissertation report will be examined by external as well as internal examiner and the recommendations will be either accepted/rejected.

## **Facilities Available**

### **I. Workshop facilities**

- Electronic Workshop
- Mechanical Workshop
- Optical Workshop
- Glass Blowing Workshop

### **II. Library Facility**

USIC right from the beginning has been making a collection of latest technical & text books covering all aspects/ topics and latest developments in the field of electronics, instrumentation, computers and control etc. Library has a stock of over eight thousand publications and is housed in a spacious room with adequate furniture.

### **III. Teaching laboratory facilities**

The centre is fully equipped with Modern Computer & Electronic Lab., Microprocessor & Control

lab. and Analytical Lab for teaching programme..Various computers have been purchased by the department and entire building of the department including the students laboratory has been put on LAN through these computers thus giving an online teaching method.

### **Placement Cell**

The course has direct job potential. Campus Placement facility for the students also exists in the Department leading to respectable placements of the passed out batches. Not only from the employment point of view but our students are performing fairly well also in higher education in India and Abroad.

**The Institute has the association with the following companies for the training and the placement purpose:**

#### **Association with the Companies**

Bilt. New Delhi

Siemens Ltd., Delhi

Bechtel Ltd, Gurgaon

Flour Daniel, Gurgaon  
Samtel Color Ltd., New Delhi  
Punj Lloyd, New Delhi  
HCL Infosystems Ltd., Delhi  
CMC Ltd.  
ST Microelectronics, Noida  
Snieder, Delhi  
TCS, Gurgaon  
Infosys Technologies Ltd. Bangalore  
HCL Tech., Noida  
Globus Infocom, Chandigarh  
Technip, Noida  
Rockwell Automation  
Jindal Steels, Hissar  
Simon Carves, New Delhi  
Lurgi, New Delhi

**Achievement**

Institute has a major project aided by the World Bank under Technical Education Quality Improvement Programme of duration 5 years which will end in June 2008, for the upliftment of the existing courses and starting the new courses. The total aid granted is 8.2 crore.