Lesson Plan

Name of the Faculty   :   Er.Amit Kumar

 Discipline   :   Mechanical Engg.

Year/Semester   :   1st Year (Annual System)

 Subject   :   **Applied Mechanics**

Lesson Plan duration   :   37 weeks

Work load per week   :   Lecture – 02, Practical – 02

| Week | Theory | | Practical |
	Lecture	Topic (Including assessment/test)	Topic
1st	1st	**Introduction :** Concept of engineering mechanics definition of mechanics	1st — Introduction about the Lab and brief discussion over the practical work to be conducted
	2nd	Statics, dynamics.	
2nd	3rd	Different systems of units (FPS, CGS, MKS and SI) and their conversion from one to another.	2nd — Verification of the polygon law of forces using Gravesand's apparatus.
	4th	Simple Numerical Problems, Fundamental Units and Derived Units	
3rd	5th	Concept of rigid body, scalar and vector quantities	3rd — Verification of the polygon law of forces usingGravesand's apparatus.
	6th	**Laws of forces :** Definition of force, Bow's Notations, types of force	
4th	7th	Point force/concentrated force & Uniformly distributed force, effects of force, characteristics of a force	4th — Checking of Practical File
	8th	Different force systems	
5th	9th	Principle of transmissibility of forces	5th — To verify the forces in different members of jib crane.
	10th	Law of super-position	
6th	11th	Composition and resolution of coplanar concurrent forces, resultant	6th — To verify the forces in

		Force Method of composition of forces		different members of jib crane.
	12th	Laws of forces, triangle law of forces		
7th	13th	Polygon law of forces - graphically, analytically, resolution of forces	7th	Checking of Practical File
	14th	Free body diagram		
8th	15th	Equilibrant force and its Determination	8th	To verify the reaction at the supports of a simply supported beam.
	16th	Lami's theorem		
9th	17th	Simple problems on above topics	9th	To verify the reaction at the supports of a simply supported beam.
	18th	1st Internal Assessment Exam		
10th	19th	**Assessment**	10th	Checking of Practical File
	20th	**Moment :** Concept of moment		
11th	21th	Moment of a force and units of moment	11th	To find the mechanical advantage, velocity ratio and efficiency in case of an inclined plane.
	22th	Varignon's theorem (definition only)		
12th	23th	Principle of moment and its Applications	12th	To find the mechanical advantage, velocity ratio and efficiency in case of an inclined plane.
	24th	Levers – simple and compound,		
13th	25th	Steel yard, safety valve, reaction at support)	13th	Checking of Practical File
	26th	Parallel forces (like and unlike parallel force) calculating their resultant		
14th	27th	Concept of couple, its properties	14th	**1st Internal Assessment Exam (Tentative)**
	28th	Effects of Couple		
15th	29^h	General conditions of equilibrium of	15th	To find the mechanical

	30th	bodies under coplanar forces		advantage, velocity ratio and efficiency of a screw jack.
		Position of resultant force by moment		
16th	31th	Simple problems on the above topics	16th	To find the mechanical advantage, velocity ratio and efficiency of a screw jack.
	32th	**Friction :** Definition and concept of friction, types of friction		
17th	33th	Force of friction, Limiting Friction	17th	Checking of Practical File
	34th	Laws of static friction		
18th	35th	Coefficient of friction angle of friction, angle of repose	18th	To find the mechanical advantage, velocity ratio and efficiency of worm and worm wheel
	36th	Equilibrium of a body lying on a horizontal plane		
19th	37th	Equilibrium of a body lying on a rough inclined plane Ladder friction	19th	To find the mechanical advantage, velocity ratio and efficiency of worm and worm wheel
	38th	Advantages and Disadvantages of Friction Methods of increasing/decreasing the force of friction.		
20th	39th	Problems	20th	Checking of Practical File
	40th	**2nd Internal Assessment Exam**		
21st	41st	**Centre of Gravity :** Concept	21st	To find mechanical advantage, velocity ratio and efficiency of single purchase crab.
	42nd	Definition of Centroid of plain figures		
22nd	43rd	Centre of gravity of Symmetrical solid bodies	22nd	To find mechanical advantage, velocity ratio and efficiency of single purchase crab.
	44th	Difference between Centroid and C.G		
23rd	45th	Determination of Centroid of plain and composite lamina using moment method only	23rd	Checking of Practical

	46th	Centroid of bodies with removed Portion		File
24th	47th	Determination of center of gravity of solid bodies – Cylinder	24th	To find out center of gravity of regular lamina.
	48th	Determination of center of gravity of solid bodies - Cube,		
25th	49th	Determination of center of gravity of solid bodies Cuboid	25th	To find out center of gravity of regular lamina.
	50th	Determination of center of gravity of solid bodies Sphere		
26th	51st	Determination of center of gravity of composite bodies	26th	Checking of Practical File
	52nd	Determination of center of gravity of solid bodies with portion removed		
27th	53rd	Problems of above topic	27th	**2nd Internal Assessment Exam (Tentative)**
	54th	**Simple Machines :** Definition of Simple and compound machine (Examples)		
28th	55th	Definition of load, effort, velocity ratio, mechanical advantage	28th	To find out center of gravity of irregular lamina
	56th	Efficiency of a machine and their relationship, law of machines		
29th	57th	Definition of ideal machine, reversible and self locking machine	29th	Checking of Practical File
	58th	Effort lost in friction, Load lost in friction**.**		
30th	59th	Determination of maximum mechanical advantage and maximum efficiency	30th	To find out center of gravity of irregular lamina
	60th	System of pulleys (first, second, third system of pulleys)		
31st	61st	Determination of velocity ratio, mechanical advantage and efficiency	31st	Checking of Practical File
	62nd	Working principle and application of wheel and axle		
32nd	63rd	Weston's Differential Pulley Block	32nd	To determine coefficient of friction between three pairs of given surface
	64th	Simple screw jack		

33rd	65th	Worm and worm wheel	33rd	Checking of Practical File
	66th	Single and double winch crab.		
34th	67th	Expression for their velocity ratio and field of their application of above m/c	34th	To determine coefficient of friction between three pairs of given surface
	68th	Numerical Problems of MA and Efficiency		
35th	69th	Numerical problems of effort lost	35th	Checking of Practical File
	70th	Numerical problems of load lost.		
36th	71st	Numerical problems of pulley 1st and 2nd systems to calculated V.R ,M.A and efficiency	36th	Internal Viva
	72nd	Numerical problems of 3rd system pulley systems to calculated V.R ,M.A and efficiency		
37th	73rd	Revision	37th	Internal Viva
	74th	Revision		

Lesson Plan

Name of the Faculty   :   Er.Shalander Mor

 Discipline   :   Mechanical Engineering

Year/Semester   :   1st Year-(Annual System) Subject

                      :   **ENGINEERING GRAPHICS**

Lesson Plan duration :   37 weeks

Work load per week   :   Lecture – 00, Practical – 03

Week	Practical	Practical
	Practical Day	Topic
1st	1st	**Unit:-1 Introduction to Engineering Drawing** Definition of Engineering Drawing, Introduction to drawing instruments, materials, layout and sizes of drawing sheets and drawing boards, engineering graph book, different grades of pencils to be used. Different types of lines in engineering drawing as per BIS specifications Practice of vertical, horizontal and inclined lines Principles of dimensioning: Types, elements, placing, different methods of dimensioning
2nd	2nd	1.5 Practice of geometrical figures such as –triangles, rectangles, circles, ellipses and parabola, hexagonal, pentagon with the help of drawing instruments.
3rd	3rd	Definition and classification of lettering, single stroke vertical and inclined lettering at 75o (alphabet and numerals) Freehand letter writing and sketches of various kind of objects in graph Sketch book/graph paper.
4th	4th	**Unit:- 2 Graphics using CAD** Meaning, requirement of computer graphics, CAD, screen structure and toolbars in AutoCAD, coordinate system, Drawing Limits, Units. Practice of LINE command, coordinates-Absolute, incremental, polar. POLYLINE, CIRCLE(3P,2P, TTR), ARC, ELLIPSE
5th	5th	Using above geometrical commands for making figure e.g. triangle, rectangle, hexagon, pentagon, parabola. 2.4 Editing commands-Scale, erase, copy, stretch, lengthen and explode
6th	6th	Use of SNAP, GRID and ORTHO mode for selection of points quickly. Use of these modes while picking points in LINE, CIRCLE, PLINE, ARC, ELLIPSE etc commands.

7th	7th	**Unit:-3 Scales** 3.1 Scales-their needs and importance (theoretical instructions), types of scales, definition of Representative Fraction(R.F.) and length of scale.
8th	8th	3.2 Construction of Plain and diagonal scale.
9th	9th	**1st Internal Assessment Exam (Tentative)**

10th	10th	**Unit:-4 Orthographic Projection**
		    Theory of orthographic projections (Elaborate theoretical instructions)
		      Projections of points in different quadrants
		      Projection of line (1st angle and 3rd angle)
		 4.3.1 Line parallel to both planes

11th	11th	44.3.2 Line perpendicular to any one of the principal plane 4.3.3 Line inclined to any one of the principal plane and parallel to other.
12th	12th	Projection of Solid-Cube, Cuboid, Cone, Prism, pyramid Three views of orthographic projections of different objects (At least one sheet in 3rd angle)
13th	13th	4.6 Making above sheets in AutoCAD of:- point line solids and two objects
14th	14th	**Unit:- 5 Sectioning and Identification of surfaces** 5. 1 Identifications of surfaces, Importance and salient features of sectioning of objects
15th	15th	5. 2 Description of full section, half section partial or broken out sections, Offset Sections, revolved sections and removed sections
16th	16th	**Unit:- 6 Isometric Views** 6.1 Fundamental of isometric projections and isometric scale
17th	17th	6.2 Isometric views of different objects
18th	18th	6.3 AutoCAD for the isometric views sheets. Making single computer sheet showing all the three views and an isometric (in single split screen view) of any object showing understanding of use of AutoCAD in making isometric views – at least 1 sheet
19th	19th	**Unit:- 7 Common Symbols and conventions used in Engineering** 7.1 Civil Engineering sanitary fitting symbols
20th	20th	**2nd Internal Assessment Exam (Tentative)**
Winter Vacations 25.12.2018 to 08.01.2019		
21st	21st	7.2 Electrical fitting symbols for domestic interior installations 7.3 Safety symbols used in engineering works
22nd	22nd	**Unit:-8 Development of surfaces (cylinder, cuboid, cone)** 8.1 Parallel line, radial line method
23rd	23rd	**Unit:-9 Detailed and assembly drawing** 9.1 Principle and utility of detailed and assembly drawings
24th	24th	9.2 Wooden joints i.e. corner mortise and tenon joint, Tee Halving joint, Mitre faced corner joint, Tee bridle joint , crossed wooden joint,

		cogged joint, dovetail joint, through Mortise and tenon joint, furniture drawing – freehand and with the help of drawing instruments
25th	25th	9.3 Making Wooden Joint sheets in AutoCAD, rendering & showing assembly animation at least 1 sheet
26th	26th	**Unit:- 10 Screw threads and threaded fastener** 10.1 Thread Terms and Nomenclature
27th	27th	10.1.1 Type of threads-external and internal threads, right and left hand threads (actual conventional representation), Single and multiple start thread.
28th	28th	10.1.2 Different forms of screw threads –V threads (B.S.W. threads, B.A thread, American National and Metric thread), Square threads (Square, Acme, buttress and Knuckle thread)
29th	29th	10.2. Nuts and Bolts 10.2.1 Different views of hexagonal and square nuts. Square and hexagonal headed bolt.
30th	30th	10. 2. 2 Assembly of Hexagonal ended bolt and Hexagonal nut with washer. 10. 2. 3 Assembly of square headed bolt with hexagonal and with washer.
31st	31st	10. 3. Locking Devices 10. 3. 1 Different types of locking devices-Lock nut, castle nut, split pin nut, locking plate, slotted nut and spring washer.
32nd	32nd	10. 3. 2 Foundations bolts-Rag bolt, Lewis bolt, Curved bolt and eye bolt. 10. 3. 3 Drawing of various types of studs
33rd	33rd	**Unit :- 11 Keys and Cotters** 11. 1 Various types of keys and cotters-weir practical application, drawings of various keys and cotters showing keys and cotters in position
34th	34th	11. 2 Various types of Joints -Spigot and Socket Joints -Gib and cotter joint -Knuckle joint
35th	35th	**Unit:- 12 Couplings** Introduction to coupling, their use and types Muff coupling
36th	36th	Flange coupling (protected) Flexible Coupling
37th	37th	**REVISION**

Govt. Polytechnic Nanakpur, Panchkula

Name of the faculty: Dharamvir Saini

Discipline: Mechanical Engg.

Year: Ist

Subject: Internet of Things and Artificial Intelligence

Lesson Plan Duration: 35 Weeks

Workload (Practical) per week (In Hours) Practical-02

Week	Practical Day/Hours	Practical
1st	1st	Introduction to Internet of Things (IoT)
	2nd	Applications (IoT)
2nd	3rd	architecture
	4th	protocols
3rd	5th	Understand the concepts of Internet of Things
	6th	Build small IoT applications
4th	7th	Understand and analyzing sensor
	8th	generated data using analytic techniques in Excel
5th	9th	Wireless sensors and actuators
	10th	Data aggregation systems and analog-to-digital data conversion
6th	11th	data center or cloud
	12th	Characteristics of IoT
7th	13th	Physical Design of IOT
	14th	Logical Design of IoT
8th	15th	Functional blocks of IoT,
	16th	Communication Models.
9th	17th	Basics of C language
	18th	using Arduino IDE
10th	19th	Understating basics of Arduino IDE
	20th	Variables
11th	21st	data type
	22th	loops,
12th	23rd	control statement
	24th	function
13th	25th	Practical using Arduino-interfacing sensors
	26th	Interfacing Light Emitting Diode(LED)
14th	27th	Blinking LED
	28th	Interfacing Button and LED
15th	29th	LED blinking when button is pressed
	30th	Interfacing Light Dependent Resistor (LDR)
16th	31st	LED, displaying automatic night lamp
	32st	Interfacing Temperature Sensor(LM35
17th	33rd	Use of sensor
	34	Revise the previous practicals
18th	35	Details of humidity sensor
	36	or humidity sensor (e.g. DHT11)

19th	37	Interfacing Liquid Crystal Display(LCD)
	38	Revise the previous practicals
20th	39	display data generated by sensor on LCD
	40	Interfacing Air Quality Sensor-pollution (e.g. MQ135)
21st	41	display data on LCD ,
	42	Revise the previous practicals
22st	43	switch on LED when data sensed is higher than specified value.
	44	Interfacing Bluetooth module (e.g. HC05
23rd	45	Revise the practicals
	46	receiving data from mobile phone
24th	47	on Arduino and display on LCD
	48	Revise the practicals
25th	49	Interfacing Relay module to demonstrate Bluetooth
	50	based home automation application. (using Bluetooth and relay).
26th	51	Revise the practicals
	52	Introduction to Artificial Intelligence (AI)
27th	53	Machine Learning (ML),
	54	Deep Learning (DL).
28th	55	Role of AI in IoT
	56	its applications
29th	57	Managing
	58	Analyzing data generated by IoT devices
30th	59	The Original Robotic Industry – Manufacturing
	60	Increased intelligence
31st	61	Big Data
	62	Machine Learning Tasks
32st	63	Machine Learning Applications
	64	History and relationship to other fields
33st	65	e.g. classification
	66	Revision of the Practicals
34th	67	linear regression, etc.
	68	Numerical based on above techniques
35st	69	Revision of the practicals
	70	Understanding excel for analyzing data

Lesson Plan

Name : **Charanjeet Singh**

Discipline : **Mechanical Engg.**

Semester : **1st Year**

Subject : **Information Technology Lab**

Lesson plan duration : 30 Weeks

Total Load : **2 practical per Week**

WEEK	PRACTICAL	
	PRACTICAL DAY	TOPIC
Ist	1	Given a PC, name its various components and peripherals. List their functions
2nd	2	Given a PC, name its various components and peripherals. List their functions
3rd	3	Installing various components of computer system and installing system software and application software
4th	4	Installation of I/O devices, printers and installation of operating system viz. Windows/BOSS/ LINUX
5th	5	Installation of I/O devices, printers and installation of operating system viz. Windows/BOSS/ LINUX

6th	6	⏺ Features of Windows as an operating system Start
		⏺ Shut down and restore
		⏺ Creating and operating on the icons
		    Opening, closing and sizing the windows and working with windows interfacing
		⏺ Elements (option buttons, checkbox, scroll etc.)
		    Using elementary job commands like – creating, saving, modifying, renaming,
		⏺ Finding and deleting a file and folders
		    Changing settings like, date, time, colour (back ground and fore ground etc.)

			⬜ Using short cuts
			⬜ Using on line help
7th	7		Features of Windows as an operating system Start
			⬜ Shut down and restore
			⬜ Creating and operating on the icons
			⬜ Opening, closing and sizing the windows and working with windows interfacing
			elements (option buttons, checkbox, scroll etc.)
			⬜ Using elementary job commands like – creating, saving, modifying, renaming,
			finding and deleting a file and folders
			⬜ Changing settings like, date, time, colour (back ground and fore ground etc.)
			⬜ Using short cuts
			⬜ Using on line help
8th	8		Word Processing (MS Office/Open Office)
			a) File Management:
			⬜ Opening, creating and saving a document, locating files, copying contents in some
			different file(s), protecting files, giving password protection for a file
			b) Page set up:
			⬜ Setting margins, tab setting, ruler, indenting
			c) Editing a document:
			⬜ Entering text, cut, copy, paste using tool- bars
			d) Formatting a document:
			⬜ Using different fonts, changing font size and colour, changing the appearance
			through bold/italic/underlined, highlighting a text, changing case, using subscript
			and superscript, using different underline methods
			⬜ Aligning of text in a document, justification of document, inserting bullets and
			numbering
			⬜ Formatting paragraph, inserting page breaks and column breaks, line spacing
			⬜ Use of headers, footers: Inserting footnote, end note, use of comments, autotext
			⬜ Inserting date, time, special symbols, importing graphic images, drawing tools
9th	9		Word Processing (MS Office/Open Office)
			a) File Management:
			⬜ Opening, creating and saving a document, locating files, copying contents in some
			different file(s), protecting files, giving password protection for a file
			b) Page set up:
			⬜ Setting margins, tab setting, ruler, indenting
			c) Editing a document:
			⬜ Entering text, cut, copy, paste using tool- bars
			d) Formatting a document:
			⬜ Using different fonts, changing font size and colour, changing the appearance
			through bold/italic/underlined, highlighting a text, changing case,

		using subscript and superscript, using different underline methods ⬜ Aligning of text in a document, justification of document, inserting bullets and numbering ⬜ Formatting paragraph, inserting page breaks and column breaks, line spacing ⬜ Use of headers, footers: Inserting footnote, end note, use of comments, autotext ⬜ Inserting date, time, special symbols, importing graphic images, drawing tools
10th	10	Tables and Borders: ⬜ Creating a table, formatting cells, use of different border styles, shading in tables, merging of cells, partition of cells, inserting and deleting a row in a table ⬜ Print preview, zoom, page set up, printing options ⬜ Using find, replace options f) Using Tools like: ⬜ Spell checker, help, use of macros, mail merge, thesaurus word content and statistics, printing envelops and lables ⬜ Using shapes and drawing toolbar, ⬜ Working with more than one window
11th	11	Tables and Borders: ⬜ Creating a table, formatting cells, use of different border styles, shading in tables, merging of cells, partition of cells, inserting and deleting a row in a table ⬜ Print preview, zoom, page set up, printing options ⬜ Using find, replace options f) Using Tools like: ⬜ Spell checker, help, use of macros, mail merge, thesaurus word content and statistics, printing envelops and lables ⬜ Using shapes and drawing toolbar, ⬜ Working with more than one window
12th	12	Spread Sheet Processing (MS Office/Open Office) a) Starting excel, open worksheet, enter, edit, data, formulae to calculate values, format data, save worksheet, switching between different spread sheets b) Menu commands: Create, format charts, organise, manage data, solving problem by analyzing data. Programming with Excel Work Sheet, getting information while working c) Work books: Managing workbooks (create, open, close, save), working in work books, selecting the cells, choosing commands, data entry techniques, formula creation and links, controlling calculations Editing a worksheet, copying, moving cells, pasting, inserting, deletion

		cells, rows, columns, find and replace text, numbers of cells, formatting worksheet, conditional formatting
13th	13	a) Starting excel, open worksheet, enter, edit, data, formulae to calculate values, format data, save worksheet, switching between different spread sheets b) Menu commands: Create, format charts, organise, manage data, solving problem by analyzing data. Programming with Excel Work Sheet, getting information while working c) Work books: Managing workbooks (create, open, close, save), working in work books, selecting the cells, choosing commands, data entry techniques, formula creation and links, controlling calculations Editing a worksheet, copying, moving cells, pasting, inserting, deletion cells, rows, columns, find and replace text, numbers of cells, formatting worksheet, conditional formatting
14th	14	Creating a chart: Working with chart types, changing data in chart, formatting a chart, use chart to analyze data Using a list to organize data, sorting and filtering data in list e) Retrieve data with query: Create a pivot table, customizing a pivot table. Statistical analysis of data f) Exchange data with other application: Embedding objects, linking to other applications, import, export document.
15th	15	Creating a chart: Working with chart types, changing data in chart, formatting a chart, use chart to analyze data Using a list to organize data, sorting and filtering data in list e) Retrieve data with query: Create a pivot table, customizing a pivot table. Statistical analysis of data f) Exchange data with other application: Embedding objects, linking to other applications, import, export document.
16th	16	Creating a chart: Working with chart types, changing data in chart, formatting a chart, use chart to analyze data Using a list to organize data, sorting and filtering data in list e) Retrieve data with query: Create a pivot table, customizing a pivot table. Statistical analysis of data

		f) Exchange data with other application: Embedding objects, linking to other applications, import, export document.
17th	17	PowerPoint Presentation (MS Office/Open Office) a) Introduction to PowerPoint - How to start PowerPoint - Working environment: concept of toolbars, slide layout & templates. - Opening a new/existing presentation - Different views for viewing slides in a presentation: normal, slide sorter. b) Addition, deletion and saving of slides c) Insertion of multimedia elements - Adding text boxes - Adding/importing pictures - Adding movies and sound - Adding tables and charts etc. - Adding organizational chart - Editing objects - Working with Clip Art
18th	18	PowerPoint Presentation (MS Office/Open Office) a) Introduction to PowerPoint - How to start PowerPoint - Working environment: concept of toolbars, slide layout & templates. - Opening a new/existing presentation - Different views for viewing slides in a presentation: normal, slide sorter. b) Addition, deletion and saving of slides c) Insertion of multimedia elements - Adding text boxes - Adding/importing pictures - Adding movies and sound - Adding tables and charts etc. - Adding organizational chart - Editing objects - Working with Clip Art
19th	19	d) Formatting slides - Using slide master - Text formatting - Changing slide layout - Changing slide colour scheme - Changing background - Applying design template
20th	20	d) Formatting slides - Using slide master - Text formatting - Changing slide layout - Changing slide colour scheme - Changing background - Applying design template
21st	21	How to view the slide show? - Viewing the presentation using slide navigator - Slide transition - Animation effects, timing, order etc.

		Use of Pack and Go Options.
22nd	22	How to view the slide show? - Viewing the presentation using slide navigator - Slide transition - Animation effects, timing, order etc. Use of Pack and Go Options.
23rd	23	Internet and its Applications
24th	24	Establishing an internet connection. Browsing and down loading of information from internet.
25th	25	Establishing an internet connection. Browsing and down loading of information from internet.
26th	26	Sending and receiving e-mail - Creating a message - Creating an address book - Attaching a file with e-mail message - Receiving a message - Deleting a message
27th	27	Sending and receiving e-mail - Creating a message - Creating an address book - Attaching a file with e-mail message - Receiving a message - Deleting a message
28th	28	Assigning IP Addresses to computers and use of domain names.
29th	29	Functioning of Antivirus a) Installation and updation of an antivirus. b) How to scan and remove the virus.
30th	30	Functioning of Antivirus a) Installation and updation of an antivirus. b) How to scan and remove the virus.