**LOK NAYAK JAI PRAKASH INSTITUTE OF TECHNOLOGY,CHAPRA**

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**COURSE FILE**

**OF**

**MACHINE DRAWING LAB**

**(021411P)**

**FACULTY NAME:**

**SACHINDRA KUMAR**

**ASSISTANT PROFESSOR,**

**DEPARTMENT OF MECHANICAL ENGINEERING**

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**Vision and Mission of Mechanical Engineering Department**

**Vision**

The Mechanical Engineering department visions to be known globally in the field of technical education and to overcome the issues of industry and society.

**Mission**

1. To deliver outcome based education to undergraduate students
2. To establish an environment for students where they can build professional and personal integrity to pursue long productive career.
3. To maintaining state of the art research facilities to provide collaborative environment that stimulates faculty, staff and students with opportunities to create, analyze, apply and disseminate knowledge.
4. To equip students with good academic, corporate and entrepreneurship skills as well as create global awareness in them required by engineering profession

**Program Educational Objectives**

1. To prepare the students for successful career in industries, entrepreneurship or in higher studies.(Preparation)
2. To inculcate engineering attitude to analyze, design and solve real life engineering problems.(Core knowledge)
3. To promote the students for continuous learning, with strong professionals, ethical and moral values.(Learning Environment)

**Program Specific Outcomes**

The graduates of Bachelor of Engineering in Mechanical Engineering Programme will be able to:

1. Design and develop mechanical as well as inter disciplinary components by experimental, numerical and analytical techniques
2. Apply their knowledge from field of mathematics and science fields to solve problems related to mechanical engineering.

**Course Objectives**

1. To understand and apply national and international standards while drawing machine

component.

2. To understand the concept of various tolerances and fits used for component design

3. To familiarize in drawing assembly, orthographic and sectional views of various machine

components.

**Course Outcomes**

**CO1** Identify the national and international standards pertaining to machine drawing.

**CO2** Apply limits and tolerances to assemblies and choose appropriate fits.

**CO3** Recognize machining and surface finish symbols.

**CO4** Explain the functional and manufacturing datum.

**CO5** Illustrate various machine components through drawings.

**Mapping of CO’s with PO’s**

|  |  |
| --- | --- |
| **Course Name**  | **Machine drawing-I [021411]** **Year : Second Year / Third Semester** |
| **CO1** | Students will learn classification of machine drawings, principles of drawing, conventional representation of machine components and materials, lines, types of lines, dimensioning types, lines and rules of dimensioning. |
| **CO2** | Students will be able learn and draw full section, half section, revolved section and off-set section. |
| **CO3** | Students will able to learn and draw fasteners, thread profile, nut bolted joints, locking arrangement of nuts, screw jack, washers, riveted joints.  |
| **CO4** | Students will be able to draw simple machine elements like bushed bearing, pedestal bearing, footstep bearing, etc. |
| **CO5** | Students will be learn and draw flanged coupling, flexible coupling, solid coupling etc. |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **CO1** | 3 | - | - | - | - | - | - | - | 2 | 2 | - | 3 |
| **CO2** | 3 | - | - | - | - | - | - | - | 2 | 2 | - | 3 |
| **CO3** | 3 | - | - | - | - | - | - | - | 3 | 2 | - | 3 |
| **CO4** | 3 | - | - | - | - | - | - | - | 3 | 2 | - | 3 |
| **CO5** | 3 | - | - | - | - | - | - | - | 2 | 2 | - | 3 |

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| **Institute / School Name :** | **LNJPIT CHAPRA** |
| **Program Name** | **B.TECH. MECHANICAL** |
| **Course Code** | **ME 021411P** |
| **Course Name** | **Machine Drawing** |
| **Lecture / Lab (per week):** | **1/3** | **Course Credits** | **3** |
| **Course Coordinator Name** | **SACHINDRA KUMAR** |

**Lecture Plan**

|  |  |
| --- | --- |
| Topics | **Lecture Number** |
| Introduction |  |
| **Introduction to section view**, full section, half section revolved section and off-set section | **2** |
| **Nut-bolt,** rivet, thread profiles, screw jack | **3** |
| **Bush bearing,** pedestal bearing,and foot step bearing | **2** |
| **Flanged coupling** flexible coupling, solid coupling | **2** |
| **Stuffing Box** | **1** |
| **Eccentric** | **1** |
| **Cross head** | **1** |
| **Assembly of disassembled parts** | **1** |
| **Disassembly of assembled parts** | **1** |

**TIME TABLE**

**3RD SEMESTER Mechanical Engineering ROOM No.- 04**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **10:00-10:50** | **10:50-11:40** | **11:40-12:30** | **12:30-01:20** | **01:20-02:00** | **02:00-02:50** | **02:50-03:40** | **03:40-04:30** |
| **MON** |  |  |  |  | LUNCH |  |  |  |
| **TUE** |  |  |  |  |  |  |  |
| **WED** |  | MACHINE DRAWING  |  |  |  |
| **THUY** |  |  |  |  | MACHINE DRAWING |  |
| **FRI** |  |  |  |  |  |  |  |
| **SAT** |  |  |  |  |  |  |  |

**Student list of 2k19 batch**

|  |  |  |
| --- | --- | --- |
| S. No. | Name of Student | Registration No. |
| 1 | Ankit Kumar | 18102117001 |
| 2 | VIKASH KUMAR GUPTA | 18102117002 |
| 3 | DHARMENDRA KR. RAM | 18102117016 |
| 4 | Amit kumar | 18102117020 |
| 5 | Priyanshu Kumar | 18102117029 |
| 6 | Radha Singh | 19102117001 |
| 7 | AMRENDRA KUMAR  | 19102117002 |
| 8 | Pankaj ray | 19102117003 |
| 9 | Rohit Kumar | 19102117004 |
| 10 | Riya singh | 19102117005 |
| 11 | Varun kumar | 19102117006 |
| 12 | Rashmi Kumari | 19102117007 |
| 13 | Nikesh kumar mishra | 19102117008 |
| 14 | Alok Aryan | 19102117009 |
| 15 | Rahmat Ali | 19102117010 |
| 16 | Anuj kumar jha | 19102117011 |
| 17 | Satyam kumar | 19102117012 |
| 18 | Saurabh kumar sah | 19102117013 |
| 19 | Nitin prasad yadav | 19102117014 |
| 20 | Anil kumar bharti | 19102117015 |
| 21 | Suraj Rawat | 19102117016 |
| 22 | Aditya raj | 19102117017 |
| 23 | Rahul kumar bharti | 19102117018 |
| 24 | Ashutosh Anand | 19102117019 |
| 25 | Sonali kumari | 19102117020 |
| 26 | Anmol kumar | 19102117021 |
| 27 | Mayank Raj | 19102117022 |
| 28 | Kaushal kumar  | 19102117023 |
| 29 | Ranvijay kumar | 19102117024 |
| 30 | Umashankar mandal | 19102117025 |
| 31 | Anil kumar  | 19102117026 |
| 32 | Ashish Ranjan kumar | 19102117027 |
| 33 | Mithilesh Sharma | 19102117028 |
| 34 | Vishal kumar | 19102117029 |
| 35 | Krishna kumar mandal | 19102117030 |
| 36 | AMAN KUMAR | 19102117031 |
| 37 | AMAN KUMAR | 19102117032 |
| 38 | Shubham kumar jha | 19102117033 |
| 39 | Deepak kumar | 19102117034 |
| 40 | Ritik Kumar | 19102117035 |
| 41 | Ajay Kumar | 19102117036 |
| 42 | Sahil Kumar | 19102117037 |
| 43 | RAUSHAN KUMAR | 19102117038 |
| 44 | Ashish Raj | 19102117039 |
| 45 | Abhinandan kumar | 19102117040 |
| 46 | Amit kumar | 19102117041 |
| 47 | Deepak kumar | 19102117042 |
| 48 | Nitish kumar | 19102117043 |
| 49 | Abhishek kumar | 19102117044 |
| 50 | Madhukar kumar | 19102117045 |
| 51 | Raksha Shekhar | 19102117046 |
| 52 | Saurav Agarwal | 19102117047 |
| 53 | Sashi Raj | 19102117048 |
| 54 | Rupali Sinha | 19102117049 |
| 55 | Murli Manohar Azad | 19102117050 |
| 56 | Alok kumar | 19102117051 |
| 57 | Anurag kumar | 19102117052 |
| 58 | Rohit Raj | 19102117053 |
| 59 | Amarjeet Raj | 19102117054 |
| 60 | Chandan Kumar Gupta | 19102117055 |
| 61 | Anshuman | 19102117056 |
| 62 | Ranjit Patel | 19102117057 |
| 63 | Gautam Kumar | 19102117058 |
| 64 | Rakesh kumar | 19102117059 |
| 65 | Manjeet kumar | 19102117060 |
| 66 | Md. Shahid Afridi | 19102117061 |
| 67 | Gulshan kumar Singh | 19102117062 |

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| **Institute Name**  | LOK NAYAK JAI PRAKASH INSTITUTE OF TECHNOLOGY, CHAPRA |
| **Program Name** | B. Tech.  |
| **Course Code** | 021411P |
| **Course Name** | MACHINE DRAWING Lab |
| **Labs (per week)** | 5 | **Course Credits** | 3 |
| **Course Coordinator Name** | SACHINDRA KUMAR |

1. **Scope and Objectives of the Course**

As machine operators, production line workers and supervisors all use production drawings so the purpose of this subject is to let know how to read orthographic or pictorial views called "working cases" to record their ideas. These preliminary sketches are used as the basis for both the component and assembly drawings. Technical Graphics is used to communicate the necessary technical information required for manufacture and assembly of machine components. These drawings follow rules laid down in national and International Organizations for Standards (ISO).

Hence the knowledge of the different standards is very essential. Students have to be familiar with industrial drafting practices and thorough understanding of production drawings to make themselves fit in industries. The following topics have been covered to fulfill the above objectives.

Classification of Machine Drawings, Principles of Drawings, Sectioning, Dimensioning, Limits, Fits and Tolerance, Symbols and Conventional Representation, Screw Fasteners, Key Joints, Coupling and its Types, Riveted Joints, Welded Joints, Structural Applications, Assembly Drawings, Production Drawings, Reproduction of Drawing, Introduction of Computer Aided Drafting, Introduction of Solid 3D Modeling.

* To understand and apply national and international standards while drawing machine component.
* To understand the concept of various tolerances and fits used for component design
* To familiarize in drawing assembly, orthographic and sectional views of various machine components
1. **Textbooks**

**TB1:** ‘Machine drawing by N.D. Bhatt

**TB2**: ‘Engineering Drawing by K. L. Narayan

**TB3**: ‘Machine Drawing by Dr. R.K Dhawan

1. **Reference Books**

**Machine Drawing by P.S. Gill**

**Machine Drawing by N.D. Bhatt**

**4. Course Plan**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Lecture Number** | Topics | **Web Links for video lectures** | **Text Book / Reference Book / Otherreading material** |  **Page numbers of Text Book(s)**  |
| 1-2 | Introduction to section view, full section, half section revolved section and off-set section |  | TB1, RB3 | 1-8 |
| 3-8 | **Nut-bolt, rivet, thread profiles, screw jack** |  | TB1, RB3 | 7-45 |
| 9-12 | **Bush bearing, pedestal bearing, and foot step bearing** |  | TB1, RB3 | 46-69 |
| 13-15 | **Stuffing box** |  | TB1, RB3 | 70-140 |
| 15-19 | **Eccentric** |  | TB1, RB3 |  |
| 19-23 | **Cross head** |  | TB1, RB3 |  |
| 23-28 | **Assembly of disassembled parts** |  | TB1, RB3 |  |
| 28-31 | **Disassembly of assembled parts** |  | TB1, RB3 |  |

**SYLLABUS**

|  |  |  |
| --- | --- | --- |
| Topics | **No of lectures** | **Weightage** |
| **Introduction to section view, full section, half section revolved section and off-set section** | 2 | 6% |
| **Nut-bolt, rivet, thread profiles, screw jack** | 2 | 6% |
| **Bush bearing, pedestal bearing,and foot step bearing** | 3 | 9% |
| **Stuffing box** | 5 | 14% |
| **Eccentric** | 4 | 11% |
| **Cross head** | 4 | 11% |
| **Assembly of disassembled parts** | 8 | 23% |
| **Disassembly of assembled parts** | 7 | 20% |

1. **Evaluation Scheme:**

|  |  |  |
| --- | --- | --- |
| Component 1\* | Lab Performance / Sheet work | 10 |
| Component 2 | Internal Viva – Voce  | 10 |
| Component 3\*\* | End Term  | 30 |
|  | total | 50 |

\*Lab Performance will be evaluated weekly

\*\*The End Term examination for practical courses is held at the end of semester and includes conduct of experiment and an oral examination (viva voce).The mandatory requirement of 75% attendance in all lab classes is to be met for being eligible to appear in this component

**This document is approved by**

|  |  |  |
| --- | --- | --- |
| **Designation** | **Name** | **Signature** |
| Course Coordinator | Sachindra Kumar |  |
| HoD | Kumar Jyotiraditya |  |
| Principal | Dr. S.N. Sharma |  |
| Date |  |  |

**LOK NAYAK JAIPRAKASH INSTITUTE OF TECHNOLOGY CHAPRA, BIHAR**

**Department of Mechanical Engineering**

**Assignment-I**

**Sub: Machine Drawing**

**Sem: 3rd (Mechanical)**

1. What do you mean by

i) Offset section ii)Revolved section iii) Half section

1. Define Pitch, Diagonal pitch and Margin
2. What is the difference between Lap and Butt joint?
3. What are the various types of welding?
4. What do you mean by Screw threads and give its practical application?
5. What is the difference between

i)Normal and Major diameter ii) V and Square thread iii) Right and Left hand thread

**LOK NAYAK JAIPRAKASH INSTITUTE OF TECHNOLOGY CHAPRA, BIHAR**

**Department of Mechanical Engineering**

**Sub: Machine Drawing Full Marks: 20**

**Sem: 4th (Mechanical)**

**All questions carry equal marks (5 marks)**

1. What is a sectional view? Why sectional views are used in drawing?
2. What is fastening? State its types.
3. What is the difference between temporary and permanent fastenings? Give examples.
4. What do you mean by welding.
5. Define nut. Give the important types of nuts used in engineering practice.
6. Define bolt. Give its important types of bolt used in engineering practice.