

DEPARTMENT OF CIVIL ENGINEERING, Govt. Polytechnic, Nayagarh

LESSON PLAN

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| Discipline: Civil Engg. | Semester: 5th | Name of the Teaching faculty: Sri Amlan Nayak |
| Subject: Structural Design-II Th-2 | No of Days/Week class allotted: 4 | No of weeks: 15 |
| Week | Class Day | Topics |
| 1st | 1st | 1.0 Introduction: Common steel structures, Advantages & disadvantages of steel structures. Types of steel, properties of structural steel. |
| | 2nd | Rolled steel sections, special considerations in steel design. Loads and load combinations. |
| | 3rd | Structural analysis and design philosophy. Brief review of Principles of Limit State design |
| | 4th | Structural Steel Fasteners and Connections Classification of bolts, advantages and disadvantages of bolted connections. |
| 2nd | 1st | Different terminology, spacing and edge distance of bolt holes. Types of bolted connections. |
| | 2nd | Types of action of fasteners, assumptions and principles of design. Strength of plates in a joint, strength of bearing type bolts (shear capacity & bearing capacity) |
| | 3rd | reduction factors, and shear capacity of HSFG bolts. Analysis & design of Joints using bearing type and HSFG bolts (except eccentric load and prying forces) |
| | 4th | Efficiency of a joint .Welded Connections: Advantages and Disadvantages of welded connection |
| 3rd | 1st | Types of welded joints and specifications for welding. |
| | 2nd | Design stresses in welds |
| | 3rd | Strength of welded joints. Reduction of design stresses for long joints |
| | 4th | 03. Design of Steel tension Members |
| 4th | 1st | Common shapes of tension members. |
| | 2nd | Design strength of tension members |
| | 3rd | yielding of gross cross section, rupture of critical section |
| | 4th | the concept of block shear |
| 5th | 1st | Maximum values of effective slenderness ratio |

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| | 2nd | Analysis of tension members |
| | 3rd | Design of tension members |
| | 4th | 04.Design of Steel Compression members |
| 6th | 1st | Common shapes of compression members |
| | 2nd | Bulking class of cross sections. |
| | 3rd | slenderness ratio |
| | 4th | Design compressive stress |
| 7th | 1st | strength of compression members. |
| | 2nd | Analysis of compression members |
| | 3rd | Design of compression members (axial load only). Analysis |
| | 4th | 5.0Steel Column bases and foundations |
| 8th | 1st | Types of column bases ,their suitability |
| | 2nd | Design of slab base Design of slab base (subjected to axial loading) with concrete footing |
| | 3rd | Design of gusseted base |
| | 4th | Design of gusseted base subjected to axial loading Design of gusseted base with concrete footing |
| 9th | 1st | 6.0Design of Steel beams Common cross sections |
| | 2nd | their classification |
| | 3rd | Plastic moment capacity of sections, moment capacity and shear resistance. |
| | 4th | Deflection limits, web buckling and web crippling. |
| 10th | 1st | Design of laterally supported beams against bending and shear. |
| | 2nd | Types of built up sections |
| | 3rd | design of simple built up sections using flange plates with I-sections or web plates. |
| | 4th | .7.0 Design of Tubular Steel structures |
| 11th | 1st | Tube columns and compression members, crinkling Round tubular sections, permissible stresses |
| | 2nd | Tube tension members and tubular roof trusses. |
| | 3rd | Joints in tubular trusses Design of tubular beams and purlins |
| | 4th | 8.0Design of Timber Structures Types of timber |
| 12th | 1st | Types of grading of timber |
| | 2nd | Types of defects, |
| | 3rd | Types of permissible stresses. |
| | 4th | Design of axially loaded timber columns solid, box |
| 13th | 1st | built up section except spaced columns |
| | 2nd | Design of simple timber structural elements in flexure Solid sections & flitched beams |
| | 3rd | form factor and moment of resistance of built-up sections |
| | 4th | check for shear, bearing and deflection |
| 14th | 1st | 9.0Design of Masonry Structures |

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| | | Design consideration for masonry walls |
| | 2nd | Design of Masonry Structures |
| | 3rd | Design consideration for masonry walls |
| | 4th | Load bearing walls -Permissible stresses Slenderness ratio, Effective length, Effective height |
| 15th | 1st | Load bearing walls -Permissible stresses Slenderness ratio, Effective length, Effective height |
| | 2nd | Effective thickness, Eccentricity of loads, Grade of mortar |
| | 3rd | Non-Load bearing walls – Panel walls, Curtain walls, Partition walls. |
| | 4th | Design consideration for masonry columns, piers and buttresses |
| 16th | 1st | REVISION |