

#### **PAVIATH INTEGRATED SOLUTION** DEMAND

**CIVIL ENGG** 

# **CIVIL POLY**

#### STEEL STRUCTURES

# **Paviath ONLINE**

## ◆ CIVIL POLY ◆ III YEAR ELECTIVE ◆ CODE CEM63.1

### **OBJECTIVES:**

- ON COMPLETION OF THE COURSE, THE STUDENT WILL BE ABLE:
- TO UNDERSTAND THE BEHAVIOR OF
- STRUCTURAL STEEL IN ITS PLASTIC STAGE. • TO LEARN PLASTIC ANALYSIS OF SIMPLE
- MEMBERS.
- TO DESIGN SIMPLE STEEL MEMBERS TO **RESIST AXIAL FORCES**
- TO DESIGN SIMPLE FLEXURAL MEMBERS.
- TO DESIGN WELDED /BOLTED CONNECTIONS FOR STEEL MEMBERS

## SIGN OF FLEXURAL MEMBERS FOR BM AND SF BY L.S.M

31 DESIGN UF FLEXINGAL MEMBERS FOR BIM AND SF BY LS.M LATERALLY SUPPORTED BEAMS - CLASSIFICATION OF STEEL BEAMS -EFFEDIVE SPAN - DESIGN PRINCIPLS - WEB BUCKLING AND WEB ERIPPUNG - MINIMUM THICKNESS OF WEB - SECTIONS WITH WEBS SUSCEPTIBLE / NOT SUSCEPTIBLE TO BUCKLING UNDER SHARA BEFORE YELDING - DESIGN BOHING STRIPKTHE OF SECTIONS WITH UDW SHEAR - EFFECT OF HOLES IN TENSION ZONE - NOMINAL SHEAR STRENGTH AND DESIGN SHEARS THE OF SECTIONS - UNITING BUCKLING HAND CASHAR STRENGTH OF SECTIONS - UNITING DEFLECTION OF BEAMS - DESIGN OF LATERALLY SUPPORTED SIMPL Beams for bending moment and shear force using single / BEAMS FUR BENDING MOMENT AND STICAR I DIRE BOTH DIRECT Double Rolled Steel Sections (symmetrical cross sections only) Problems – Unsymmetrical (bi – Axial) bending – DESIGN OF LATERALLY SUPPORTED PURLINS FOR SLOPED RODF TRUSSES (FOR GIVEN VERTICAL UDL WITH BM COEFFICIENT 0.085) - SUMPLE PROBLEMS.

# - SIMPLE PROBLEMS. 4.1 DESIGN OF SECTIONS FOR COMBINED ACTIONS SECTIONS SUBJECTED TO BENOING MOMENT AND HIGH SHEAR FORCE - EFFECT OF HIGH SHEAR ON FLEXURAL CAPACITY OF SECTIONS - LIMITING VALUE OF SHEAR FORCE FOR FULL MOMENT CAPACITY OF SECTIONS - REDUCED DESIGN STREAGHT OF FUNCTIONE COMMART / SEMI COMPACT SECTIONS SUBJECTED TO HIGH SHEAR PACIFICAT / SEMI COMPACT SECTIONS SUBJECTED TO HIGH SHEAR PACIFICAT / SEMI COMPACT SECTIONS SUBJECTED TO HIGH SHEAR DESIGN OF SUPPORT SECTIONS OF CANTILEVERS AND CONTINUOUS EAMS - PROBLEMS

INTRODUCTION TO PLASTIC ANALYSIS AND LIMIT STATE DESIGN LI INTRODUCTION TO PLASTIC ANALYSIS AND LIMIT STATE DESIGN PLASTIC ANALYSIS: ANALYSIS OF STELL STRUCTURES – METHODS – ELASTIC, PLASTIC AND DYNAMIC MALAYSIS AND ADVANCED METHOD DF ANALYSIS BASED ON IS:800 – 2007 – IDEALZED STRESS VS STRAIN CURVE FOR STRUCTURAL STELL – REDURKMENTS AND ASSUMPTIONS OF PLASTIC METHOD OF RAVLSIS – FORMATION OF PLASTIC HINGES IN FLEXURAL MEMBERS – PLASTIC MOMENT OF RESISTINCE AND PLASTIC MODULUS OF SECTIONS – SHARP FACTORS OF RECTANGULAR / CIRCULAR / 1/T - SECTIONS – SHARP FACTORS OF RECTANGULAR / CIRCULAR / 1/T - SECTIONS – COLLAPSE LOAD OF DETRIMINATION OF COLLAPSE LOADS FOR CANITEVER, SIMPLY SUPPORTED AND FXED BEAMS BY ANY (STATICALLY OR KINEMATICAL METHOD – PROBLEMS.

METHOD - PROBLEMS. LIMIT STATE DESIGN : ADVANTAGES OF LIMIT STATE DESIGN OF STEEL STRUCTURES - BAXIS FOR DESIGN - CLASSIFICATION OF LIMIT STATES - CHARACTERISTIC AND DESIGN ACTIONS - ULTIMATE AND DESIGN STRENDINS - PARTIAL SAFETY FACTORS FOR LIADOS ANO MATERIAS - DESIGN REDUIRFORTS - STRENETH REDUIRFMENTS : STABILITY , FATIGUE AND PLASTIC COLLAPSE - SERVICE ABILITY REDUIREMENTS : DEFLECTION LIMITS, VIBRATION, DURABILITY AND THE RESURCE FOR UNDERSTREAMENTS - STRENET REDUIRFMENTS -STABILITY , FATIGUE AND PLASTIC COLLAPSE - SERVICE ABILITY REDUIREMENTS : DEFLECTION LIMITS, VIBRATION, DURABILITY AND THE RESURCE FOR UNDERSTREAMENTS - STRENET REDUIRFMENTS -STABILITY , FATIGUE AND PLASTIC COLLAPSE - SERVICE ABILITY REDUIREMENTS : DEFLECTION LIMITS, VIBRATION, DURABILITY AND FIRE RESISTANCE -GEOMETRICAL PROPERTIES OF GROSS AND EFFECTIVE CROSS SECTIONS - CLASSIFICATION OF CROSS SECTIONS AS PER IS:800-2007

S.I DESIGN OF CONNECTIONS AND DETAILING General - Types of connections - Boliter Riveted and Welded Connections - Rigid and Flexible connections - Components of Connections - Basic Requirements of connections - Clearance for Holes - Minimum and Maximum Specing -MINIMUM EDGE/END DISTANCES - REQUIREMENTS OF TACKING FASTENERS.

BOLTED CONNECTION - TYPES OF BOLTS -BEARING TYPE BOLTS -Nominal and design shear strengths of Bolts - Reduction FACTORS FOR LONG JOINTS, LARGE GRIP LENGTHS, THICK PACKING Plates-nominal and design bearing strengths of bolts – REDUCTION FACTORS FOR OVER SIZED AND SLOTTED HOLES -Nominal and design tensile

NOMINE AND DECONTINUATE INSIDE STRENETISCENSION CAPACITY) OF BOLTS-FRICTION GRIP TYPE BOLTS -ADVANTAGES - REQUIREMENTS AS PER IS 3757 -NOMINA AND DESIGN SUP RESISTANCE OF BOLTS IN SHEAR - SUP FACTORS AND DECISION SUF RESISTANCE OF DOLLS IN STREAME SUF FALL PROBLEMS (COMBINED ACTIONS NOT INCLUDED). WELDED CONVECTION - TYPES OF WELDS - FILLET WELDS -MINIMUM AND MAXIMUM SIZES - EFFECTIVE LENGTH OF WELD -FILLET WELDS ON INCLUNED FACES - DESIGN STRENGTHS OF DURDO DIRVE WELD - OUTER WIND - EFFECTIVE STRENGTHS OF

SHOP/SITE WELDS – BUTT WELDS – EFFECTIVE THROAT THICKNESS AND EFFECTIVE LENGTH OF BUTT WELD – STRENGTH OF BUTT WELD -

## I DESIGNOFTENSIONANDCOMPRESSIONMEMBERSBY

TENSION MEMBERS – DESIGN STRENGTH OF TENSION MEMBERS AGAINST YIELDING OF GROSS SECTION, AGAIN STRUCTURE OF Critical Section and due to block shear – design REDUIREMENTS – PROBLEMS ON DETERMINATION OF DESIGN Strength of given members and designing tension members STRENENT OF GIVEN REMBERS AND DESIGNING TENSION MEMBERS USING ROLLED STEEL SECTIONS FOR GIVEN LOADS – DESIGN OF BOLTED AND WELDED CONNECTIONS FOR TENSION MEMBERS. COMPRESSION MEMBERS – EFFECTIVE LEMOTH AND EFFECTIVE SECTIONAL AREA OF COMPRESSION MEMBERS – DESIGN STRESS AND DESIGN STRENGTH – BUCKLING CLASS OF ERORS SECTIONS – IMPERFECTION FACTOR – STRESS REDUCTION FACTOR – THICKNESS OF ELEMENTS – ECCENTRICITY OF LOADS ON COLUMNS – SINGLE ANDIE MIN DOTIES ANDIE ACTUALTY. BUT THE ANDIE ACTOR UP ELEMENTS - ELEMENTATION DUDINES - SINGLE ANGLE AND DUBLE ANGLE STRUTS - BOLTED AND WELDED CONVECTING FOR STRUTS - DESIGN OF BUILT UP COLUMNS -CONVECTING THE COMPONENTS OF BUILT UP COLUMNS BY TACKING BOLTS / WELDS - REDUREMENTS OF CONNECTIONS - LACED COLUMNS -SINGLE AND DUBLE LACED SYSTEMS - REDUREMENTS DEVINED ADD DUBLE LACED SYSTEMS - RECOMPRENTS OF LACING BARS – DESIGN OF LACINGS – BATTENED COLUMNS – Reduirements of battens –design of battens – problems COLLIMN BASES - SLAB BASE AND GUSSETED BASE

#### TEXT BOOK:

1. M.R.SHIYEKAR - LIMIT STATE DESIGN IN STRUCTURAL STEEL , PHI LEARNING **PVT LTD.2011** 

#### **REFERENCE BOOK:**

2. K.S.SAI RAM — DESIGN OF STEEL STRUCTURES PEARSON- PORLING **KINDERSLEY PVT LTD** 3. DR.SUBRAMANIAM – STEEL STRUCTURES, LAXMI PUBLICATIONS, 2011.



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