Postgraduate Certificate in Structural Steel Design

Steel Bridge Design.

AASHTO: The American Association of State Highway and Transportation Officials, which develops standards and guidelines for transportation infrastructure, including steel bridges.

ABC (Accelerated Bridge Construction): A construction method that uses innovative planning, design, and construction techniques to reduce the on-site construction time of bridge projects.

AASHTO LRFD (Load and Resistance Factor Design): A standard for the design of bridges that uses load and resistance factors to account for uncertainty in loads and material properties.

Bearing: A device used to support and transfer loads from the bridge superstructure to the substructure.

Bent: A vertical or near-vertical column that supports the bridge superstructure and transfers loads to the foundation.

Bridge Deck: The horizontal surface of the bridge that supports the traffic.

Camber: The intentional upward curvature of a bridge deck or beam to counteract the effects of dead load deflection.

Cantilever: A structural member that projects beyond its support, such as the ends of a bridge deck or beam.

Composite Beam: A beam made of two or more different materials, such as steel and concrete, that act together to resist loads.

Connections: The elements that join steel members together, such as bolts, welds, or rivets.

Continuous Beam: A beam that spans over multiple supports, allowing for more efficient use of materials.

Diaphragm: A horizontal or vertical bracing element used to stiffen and stabilize a steel frame.

Fatigue: The progressive and permanent structural damage that occurs when a material is subjected to repeated loading.

Fracture Critical Member (FCM): A steel member whose failure could cause the collapse of the entire bridge.

Fracture Toughness: A material's ability to resist fracture when subjected to high stresses.

Gerber Beam: A type of continuous beam that uses a series of vertical web stiffeners to resist torsional forces.

Haunch: The portion of a beam or girder that is thicker than the rest of the member to resist higher bending moments.

High-Performance Steel (HPS): A type of steel with enhanced properties, such as increased strength, toughness, and corrosion resistance.

Hinge: A point in a bridge where rotation is allowed, such as at the connection between two beams or girders.

Live Load: The load imposed on a bridge by moving vehicles, pedestrians, or other dynamic forces.

Moment Connection: A connection that allows for the transfer of moments between steel members.

Parker Rolling Lift Bridge: A type of lift bridge that uses a rolling mechanism to raise and lower the bridge deck.

Pile Foundation: A type of foundation that uses deep piles driven into the ground to support the bridge substructure.

Plate Girder: A type of beam made of steel plates, used for long spans and heavy loads.

Pony Truss: A type of truss bridge that has a single plane of triangular members supporting the bridge deck.

Rolled Beam: A beam that is formed by rolling a steel plate into a curved shape.

Simple Beam: A beam that is supported at two ends, allowing for the transfer of vertical loads only.

Stay-in-Place Forms: Formwork used for casting concrete that remains in place after the concrete has cured.

Stiffener: A thin piece of steel added to a beam or girder to increase its stiffness and resistance to buckling.

Strut-and-Tie Model: A method of analyzing and designing a concrete structure by modeling it as a system of tension and compression members.

Superstructure: The part of a bridge that supports the bridge deck and traffic.

Tension Member: A member in a bridge that is subjected to tensile forces.

Through Girder: A type of beam that is supported at three or more points, allowing for the transfer of vertical and horizontal loads.

Torsion: The twisting force that is applied to a member, causing it to rotate.

Truss: A structural framework made of triangular members, used for supporting bridges, buildings, and other structures.

Ultimate Limit State (ULS): The point at which a bridge fails or becomes unsafe for use.

Vierendeel Girder: A type of girder that uses rectangular instead of triangular members, allowing for greater flexibility in the placement of openings and connections.

Web Stiffener: A thin piece of steel added to a beam or girder to increase its stiffness and resistance to buckling.

Welded Connection: A connection that uses welding to join steel members together.

Yield Strength: The amount of stress that a material can withstand before it starts to deform permanently.