# FRP Composites for Reinforced Concrete Construction

## In-House Seminar

ONE DAY, 7.5 HOURS (7.5 PDHs/0.75 CEUs)

Practical application of products and systems for new and retrofit reinforced concrete construction

**Who should attend:**
Engineers, designers, contractors, owners, and building officials will receive information on the specification, design, and construction of concrete reinforced with FRP bars

## Program Content:

This intensive seminar will introduce FRP materials and focus on the practical application of products and systems currently in use for new and retrofit reinforced concrete construction.

### Part I Introduction to FRP Composite Materials and Systems

**FRP Forms, Products, and Applications**
- FRP rebar; Other FRP forms; FRP strengthening systems

**Physical and Mechanical Properties and Behavior of FRP Systems**
- Design tensile strength; Time-dependent behavior; Fatigue; Durability

### Part II Design of Concrete Members with Internal FRP Reinforcement

**Flexural Design**
- Failure modes; Flexural capacity; Minimum reinforcement; Serviceability

**Shear Design**
- Failure modes; Shear capacity; Stirrup design

**Temperature and Shrinkage Reinforcement**
- Development length of a straight bar; Development length of a bent bar; Tension lap splice

### Part III Design of FRP Strengthening Systems for Concrete Structures

**Strengthening Concrete Structures**
- Reasons for strengthening; Types of FRP strengthening systems; Materials and properties of FRP strengthening systems

**Substrate Preparation/FRP Application**
- Substrate repair; Installation methods; Quality control

**Design Principles**
- Strengthening limits; Flexural strengthening; Shear strengthening; Axial strengthening

**Reinforcement Details**
- Bond and delamination; Detailing of laps and splices

**Design examples and case studies**
- Recently completed projects will provide the attendees with field application information and will demonstrate why FRP composites are used for strengthening concrete structures

## Instructors:

Two industry experts will present this seminar.

## Related Documents:

To expand attendees knowledge, ACI In-House Seminar customers may purchase multiple copies of related documents at 50% off the regular price.

- Guide for the Design and Construction ofExternally Bonded FRP Systems for Strengthening Concrete Structures (ACI 440.2-17)
- Special handout with notes authored by the instructors

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ACI is an approved education provider for AIA and ICC.

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Up to 40 printouts of the presentation included. Additional copies can be purchased.