

### **CIM 3000 Fundamentals of Concrete: Properties and Testing**

ASTM's covered in course: C29, C31, C33, C39, C78, C94, C109, C125, C127, C128, C138, C143, C172, C173, C231, C294, C805, C1064, & C1231.

CIM3000 examines effects of concrete-making materials (aggregates, cements, admixtures, etc.) on the properties of fresh and hardened concrete. Concrete mixture proportioning calculations and statistical analysis of strength tests are also studied.

Topics will include:

- aggregate properties and testing (grading, specific gravity, absorption, moisture content, abrasion resistance, soundness, harmful substances)
- cement properties and testing (chemical composition, fineness, setting time, soundness, strength)
- supplementary cementing materials (fly ash, silica fume, blast-furnace slag)
- admixtures (air-entraining agents, water reducers, accelerators, retarders)
- fresh concrete properties and testing (workability, slump, air content, unit weight)
- hardened concrete properties and testing (strength, durability, volume changes, permeability)
- concrete mix proportioning (normal strength, high strength, and special mixes)
- statistical analysis of concrete strength tests
- ACI Level I Field Testing Certification

### **CIM 4200 Senior Concrete Lab**

ASTM's covered in course: C88, C157, C403, C490, C617, C642, C666, C845, C1202, C1585, C1579, C1688, C1701

CIM4200 provides students an opportunity to further develop their technical and laboratory knowledge and pursue a project of individual interest. A formal report/presentation will be required at the conclusion of the course.

Topics will include:

- advanced laboratory testing and field evaluation techniques
- individually guided project(s)
- ACI Level I Lab Certification

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