**Major Topics**

Microstructure of cement paste;

special cements; concrete-environment interactions;

time-dependent effects

Creep and shrinkage

durability of concrete

corrosion of reinforced concrete

use of marginal and recycled aggregate

polymers and polymer concrete systems

properties and use.

Fiber reinforced concretes

properties and use.

Nano Concrete

**Introduction to Concrete**

 Introduction

Importance and Reasons for Success

 Constituents of Concrete

Components of Modern Concrete

Plain & Reinforced Concrete

Properties of Concrete

 Curing of Concrete

 Mix Proportions

 Mix Design Relations

 Workability

 W/C Ratio

 Slum Test

 Consolidation

 Types of Cement

 Aggregates

 Admixtures

 Traditions and Advanced Concrete

 High Performance Concrete

 Structural Requirements

 Concrete-Structure System

 Construction Equipment

 Concrete Joints

 Testing of Concrete

 Code Speciation

**Durability Related Issues of Concrete**

 Different Forms of Deterioration

 Corrosion of Steel in Concrete

 Concrete Cracking

 Alkali-Silica Reaction

 Sulfate Attack

 Chloride Attack

 Carbonation

 Calcium Leaching

   Code Provisions

 Conclusion

**Hot Weather Concreting**

 Introduction

 Precautionary Measures

 Effect of Hot Weather on Fresh and Hardened Properties of Concrete

 Effect of Chemical Admixtures

 Plastic Shrinkage Cracking

 Saudi Building Code (SBC) Code Provisions

 Conclusion

**Developments in Concrete Technology**

 Concrete-The Material of Choice

 Examples of Significant Developments

 Concrete with Superplasticizers

 High-Strength Concrete

 High Performance Concrete

 Ultra High Performance Concrete

 Silica-Fume Concrete

 Self-Compacting Concrete

 High-Volume Fly Ash Concrete

 Slag Concrete

 Nano-Concrete and its Applications

 Future of Concrete Technology Developments

 Driving Forces of the Future

 Concrete Technology of 22nd Century

 Prediction of Performance

 Simulation Authenticity

 Changing Trends

 Future Concrete

 Sustainability Issues

 Future Durability Requirements

 Availability of Resources

 Eco-Friendliness

 Significance for Education in Concrete Technology

**Advanced Concrete Technology**

 Need for Materials

 New Criteria

 Concrete Facts

 Structure & Properties

 Various Influencing Factors

 Durability Issues

 Environmental Actions

 Conclusion