Digital System Verification (CE-DSV)

CE-DSV0. History and Overview Including Pentium Bugs and other Horror Stories, Verification vs. Validation. Relationship of Good Design Practice to Verification (3 hours)

CE-DSV2. Comparison of Simulation, Testing, and Formal Verification (Timing Analysis) for Timing (4 hours)

CE-DSV3. Formal Verification: Model Checking (10 hours)

CE-DSV4: Formal Verification: Proofs (6 hours)

CE-DSV5: Formal Verification: Equivalence Checking (3 hours)

CE-DSV6: Verification by Simulation and Testbenches (4 hours)

CE-DSV7: Verification by Assertions and Verification Languages (4 hours)

CE-DSV8: Verification by Testing (2 hours)

CE-DSV9: Other Verification: Signal Integrity, Specification, Reliability, Safety, Power, Cooling, ASIC Physical Design, … (3 hours)

CE-DSV10: Comparison and Contrast of Verification, Testing, and Reliability (1 hour)

CE-DSV11: Configuration Control, Bug Tracking, Regression Testing (2 hours)

CE-DSV12: Economics of Verification (2 hours)

CE-DSV0. History and overview of digital system verification [core]

Suggested time: 1 hour

Topics:
- Indicate some reasons for studying digital system verification.
- Highlight some people that influenced or contributed to the area of digital system verification.
- Indicate some important topic areas such as verification, validation, and that good system design relates to these characteristics.
- Contrast the meanings validation with verification.
- Mention that formal proofs play a vital role in system design.
- Indicate the importance of reliability.
- Provide some examples that show the economic consequences of poor system integrity and verification.
- Explore some additional resources associated with digital system verification.
- Explain the purpose and role of digital system verification in computer engineering.

Learning objectives:
- Identify some contributors to digital system verification and relate their achievements to the knowledge area.
- Know some characteristics of good system design.
- Articulate the meanings of validation, verification, integrity, and reliability.
- Contrast the characteristics of testing, verification, and reliability.
- Articulate some consequences of poor digital system design.
- Describe how computer engineering uses or benefits from digital system verification.
Possible texts and references:


For further reading, see Randy Bryant's web page:
http://www.cs.cmu.edu/afs/cs.cmu.edu/user/bryant/www/home.html


Mike Gordon Notes/Transputer Paper on IEEE Arithmetic


Two sites on open vera verification language
www.open-vera.com
www.smartverification.com