

UNIVERSITY OF SOUTHERN CALIFORNIA

COMPUTER ENGINEERING

SCREENING EXAMINATION

ELECTIVE COURSE NO: **EE 658**

Diagnosis and Design of Reliable Digital Systems

SUGGESTED READING

All students are assumed to have an excellent knowledge of the major pre-requisite for this class, namely EE 101, i.e. a basic course in logic design. Excellent books covering this material include:

1. J. F. Wakerly, **Digital Design, Principles and Practice**, Prentice-Hall, New Jersey, 3rd edition, 2001, ISBN 0-13-089896-1.
2. M. Morris Mano and C. R. Kime, **Logic and Computer Design Fundamentals**, 2nd edition updated, Prentice Hall, 2001, ISBN 0-13-031486-23.

Good sources of material that cover the main topics of EE658 include:

1. N. Jha and S. K. Gupta, **Digital Systems Testing**, Cambridge University Press, 2003, ISBN 0521773563. Chapters 3, 4, 5, 11, 12
2. M. Abramovici, M.A. Breuer and A. D. Friedman, **Digital Systems Testing and Testable Design**, Computer Science Press, 1990; IEEE, 1992; John Wiley, 1998, ISBN 0-7167-8179-4. Chapters 1-6, 9-11.

Some optional sources for further reading include:

1. A. Crouch, **Design-for-Test**, Prentice Hall, 1999, ISBN 0-13-084827-1.
2. S. Mourad and Y. Zorian, **Principles of Testing Electronic Systems**, John Wiley, 2000, ISBN 0-471-31931-7.
3. M. Breuer and A. D. Friedman, **Diagnosis and Reliable Design of Digital Systems**, Computer Science Press, 1976, ISBN 0-914894-57-9.
4. One can go to the Internet and possibly find other materials, such as course lecture notes and/or surveys presented at conferences.

The exam will stress concepts. As a trivial example from EE 101, a freshman class on logic design, we all understand how to find all the prime implicants of a Boolean switching function using a Karnaugh map. But do you know things like: the precise definition of a prime implicant; the difference between essential, redundant, and non-essential irredundant prime implicants; the reason we seek the prime implicants rather than just the implicants of a function; and, if there can be more prime implicants than minterms? For each area (topic) you study, ask yourself the following questions: what are the significant contributions in this area, who made them, and can I clearly describe them; why are these contributions significant; how is this information relevant today, and in the near future; what

are the associated counting/enumeration/complexity issues associated with any important algorithmic techniques in this field.

Please be aware that these references are for guidance in BASIC knowledge. Ph.D. candidates are screened on the basis of talent, course knowledge, independent reading and experience.
