1. Catalog Description – (3 credits) Advanced very large scale integrated circuit design, testability, and performance evaluation. Use of industrial VLSI software. Building an advanced CMOS VLSI circuit.

2. Pre-requisites and Co-requisites – EEL 5322

3. Course Objectives - To develop a basic understanding of CMOS integrated circuit design. To develop proficiency in analysis, design and implementation of CMOS circuits. To develop a basic understanding of design considerations to maximize chip success.

4. Contribution of course to meeting the professional component (ABET only – undergraduate courses)

5. Relationship of course to program outcomes: Skills student will develop in this course (ABET only undergraduate courses)

6. Instructor – Dr. Rizwan Bashirullah
   a. Office location: 527 NEB
   b. Telephone: 392-0622
   c. E-mail address: rizwan@ufl.edu
   d. Class Web site: [http://www.icr.ece.ufl.edu/teaching/EEE6323-S12/EEE6323.htm](http://www.icr.ece.ufl.edu/teaching/EEE6323-S12/EEE6323.htm)
   e. Office hours: Tuesdays 11:30am-12:30pm, Thursdays 2:00pm-2:50pm

7. Teaching Assistant – Quizhong Wu
   a. Office location: 556 NEB
   b. Telephone:
   c. E-mail address: qiuzhongwu@ufl.edu
   d. Office hours: Wednesday 3:00pm-5:00pm

   Teaching Assistant – Abhimanyu Kapoor
   a. Office location: 506 NEB
   b. Telephone:
   c. E-mail address: abhimanyukapoor@ufl.edu
   d. Office hours: Mondays 3:00pm-5:00pm

8. Meeting Times – Tuesday 4th, Thursday 4th-5th

9. Class/laboratory schedule - 3 class periods consisting of 50 minutes each

10. Meeting Location – 130 PSY

11. Material and Supply Fees - None
12. Textbooks and Software Required -
   a. Title: CMOS VLSI Design, A Circuits and Systems Perspective
   b. Author: Neil H.E. Weste, David Harris
   c. Publication date and edition: 3rd Edition, Pearson, Addison-Wesley, 2005
   d. ISBN number: 0-321-14901-7
   e. Software: Workstations with CADENCE Design system.
   f. Handouts: Developed by instructor may be downloaded from class website

13. Recommended Reading –
   a. Title: Digital Integrated Circuits, A Design Perspective
   b. Author: Jan. M. Rabaey, A. Chandrakasan, and B. Nikolic
   d. ISBN number: 0-13-090996-3

14. Course Outline (provide topics covered by week or by class period) –
   • Scaling Trends
   • Process Technology
   • Transistor Models
   • Logical Effort
   • Wires
   • Digital IC flow
   • Synthesis and Place and Route
   • Circuit Families
   • Dynamic Circuits
   • Low Power Design
   • Adders
   • Multipliers
   • Clock Distribution and Generation
   • Skew Tolerant Design
   • Latches and Flip-flops
   • Signaling
   • Packaging and I/O
   • Power Delivery and Decoupling
   • Memory
   • Variability/Circuit Pitfalls

15. Attendance and Expectations - It is expected that students will attend all lectures on-time. Furthermore, it is expected that attendees will take every possible measure to minimize distractions for everyone.

16. Grading –
   Problem sets (5-6): 30%
   Midterm (2): 20% each
   Final Project (1): 30%
17. Grading Scale (e.g., 90-100 A, 85-89 B+, 80-84 B, etc.)

- 90 – 100 = A
- 87 – 89 = A-
- 83 – 86 = B+
- 80 – 82 = B
- 77 – 80 = B-
- 73 – 76 = C+
- 70 – 72 = C
- 67 – 72 = C-
- 63 – 66 = D+
- 60 – 62 = D
- 57 – 59 = D-
- < 57 = E

“In order to graduate, graduate students must have an overall GPA and an upper-division GPA of 3.0 or better (B or better). Note: a B- average is equivalent to a GPA of 2.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit:

http://gradschool.ufl.edu/catalog/current-catalog/catalog-general-regulations.html#grades

18. Make-up Exam Policy – If you have a University-approved excuse and arrange for it in advance, or in case of documented emergency, a make-up exam will be allowed. For information on UF policies concerning attendance, please visit:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx#absences

19. Honesty Policy – All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

20. Accommodation for Students with Disabilities – Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

21. UF Counseling Services – Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
- Career Resource Center, Reitz Union, 392-1601, career and job search services.
22. Software Use – All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.