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| |  | | --- | | **Course Information** |  |  |  | | --- | --- | | Course title | Introduction to Electronic Design Automation | | Semester | 107-2 | | Designated for | COLLEGE OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE  DEPARTMENT OF ELECTRICAL ENGINEERING | | Instructor | [JIE-HONG JIANG](https://nol2.aca.ntu.edu.tw/nol/coursesearch/teacher.php?op=s2&td=943014) | | Curriculum Number | EE3012 | | Curriculum Identity Number | 901 33700 | | Credits | 3.0 | | **Course Syllabus** | | | **Please respect the intellectual property rights of others and do not copy any of the course information without permission** | | | Course Description | 1. Introduction  History, VLSI design flow, etc.  2. Basics of Computation Theory and Mathematical Optimization   3. Models of computation  Finite state machine, finite automata, Kahn process network, Petri net, neural network, etc.  4. High-level synthesis  Design space exploration, resource sharing, etc.  5. Logic synthesis  Technology independent optimization, technology mapping, technology dependent optimization, timing and power analysis, etc.  6. Verification  Combinational and sequential equivalence checking, property checking, etc.  7. Physical design  Floorplanning, placement, routing, etc.  8. Testing  Combinational and sequential ATPG, design for test, etc.  9. Simulation  Numerical techniques, device modeling, switch-level and logic-level simulation, etc. | | Course Objective | Electronic Design Automation (EDA) concerns the correctness, reliability, productivity, and optimization of system construction. It is an interdisciplinary field, where electrical engineering and computer sciences intersect. In EDA, theoretical computer science (including algorithms, complexity, automata, logic, programming languages, etc.) finds rich and practical applications. On the other hand, some of the techniques developed in the EDA community have been much enhanced the state-of-the-art solvers on intractable problems. In this course we will study some representative problems and solutions making VLSI design an automatic process. In particular, we will cover system modeling, optimization, analysis, and verification. | | References | Textbook： Electronic Deisng Automation: Synthesis, Verification, and Test, Laung-Terng Wang, Kwang-Ting (Tim) Cheng, and Yao-Wen Chang, editors, Morgan Kaufmann Publishers, 2009. |  |  | | --- | | **Progress** |  |  |  |  | | --- | --- | --- | | Week | Date | Topic | | Week 1 | 2/18 | Introduction | | Week 2 | 2/25 | Computation and Optimization | | Week 3 | 3/04 | Models of Computation | | Week 4 | 3/11 | High-Level Synthesis | | Week 5 | 3/18 | Logic Synthesis (1) | | Week 6 | 3/25 | Logic Synthesis (2) | | Week 7 | 4/01 | Logic Synthesis (3) (4/13 補課) | | Week 8 | 4/08 | Verification (1) | | Week 9 | 4/15 | Verification (2) | | Week 10 | 4/22 | Verification (3) | | Week 11 | 4/29 | Guest Lecture by Dr. Alan Mishchenko (author of Berkeley Logic Synthesis and Verification System ABC) | | Week 12 | 5/06 | Midterm (5/6); Physical Design (1) (5/11 補課) | | Week 13 | 5/13 | Physical Design (2) | | Week 14 | 5/20 | Physical Design (3) | | Week 15 | 5/27 | Testing (1) | | Week 16 | 6/03 | Testing (2) | | Week 17 | 6/10 | Advanced Topics | | Week 18 | 6/17 | Final Quiz; Advanced Topics | | Week 19 | 6/24 | Project Presentation | |

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