

Submit original with signatures + 1 copy + electronic copy to Faculty Senate (Box 7500).

complete description of the rules governing curriculum & course changes

TRIAL COURSE OR NEW COURSE PROPOSAL

SUBMITTED BY:

Department	Electrical and Comp Engr	College/School	CEM
Prepared by	Jason McNeely	Phone	474-7228
Email Contact	jbmcneely@alaska.edu	Faculty Contact	Jason McNeely

1. ACTION DESIRED (CHECK ONE):

Trial Course	<input type="checkbox"/>	New Course	<input checked="" type="checkbox"/>
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2. COURSE IDENTIFICATION:

Dept	EE	Course #	648	No. of Credits	3
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Justify upper/lower division status & number of credits:

Graduate Course. Basic knowledge in electrical engineering, computer engineering, or computer science that would be met through an undergraduate curriculum would be sufficient for enrolment in this course. There will be 3 hours of lecture per week.

3. PROPOSED COURSE TITLE: **VLSI Design**

4. To be CROSS-LISTED? NO YES If YES, Course # _____

9. CONTACT HOURS PER WEEK:

LECTURE hours/weeks LAB hours /week PRACTICUM hours /week

Note: # of credits are based on contact hours. 800 minutes of lectures=1 credit. 2400 minutes

of lab in a science course=1 credit. 1600 minutes in non-science lab=1 credit. 2400-4800 minutes of practicum=1 credit. 2400-8000 minutes of internship=1 credit. This must match with the syllabus. See <http://www.usf.edu/ua/eaoy/faculty-senate/curriculum/course-degree-procedures>

~~/guidelines-for-computing-/~~ for more information on number of credits.

OTHER HOURS (specify type)

10. **COMPLETE CATALOG DESCRIPTION** including dept., number, title, credits, credit distribution, cross-listings and/or stacking (50 words or less if possible):

Example of a complete description:

FISH F487 W, O Fisheries Management
3 Credits Offered Spring

Theory and practice of fisheries management, with an emphasis on strategies utilized for the management of freshwater and marine fisheries. Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; ENGL F414; FISH F425; or permission of instructor. Cross-listed with NRM F487. (3+0)

EE F648 VLSI Design

3 Credits Offered Spring Odd-numbered Years

RESTRICTIONS ON ENROLLMENT (if any)

14. PREREQUISITES

EE 343 or equivalent

Those will be required before the student is allowed to enroll in the course

**15. SPECIAL RESTRICTIONS,
CONDITIONS**

16. PROPOSED COURSE FEES

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Has a memo been submitted through your dean to the Provost for fee approval?
Yes/No

17. PREVIOUS HISTORY

APPROVALS: Add additional signature lines as needed.

<i>Charles E Mayer</i>	Date	8/23/13
Signature, Chair, Department of	Electrical and Computer Engineering	

EE 693 VLSI Design

COURSE INFORMATION

Instructor: Dr. Jason McNeely, Duckering 227
Office Phone: 474 7229

Email: jbmneely@alaska.edu
Office Hours: Monday 2:00-4:00; Thursday 2:30-4:30
(You may also schedule an appointment or just drop by. The best way to reach me outside of office hours is via email.)

Lectures: MWF 10:30-11:30
Location: DUCK 406

Credits: 3

Prerequisites: EE 342

Textbook: *CMOS VLSI Design: A Circuits and Systems Perspective* 4th Edition, Neil Weste and David Harris. 2011 Pearson Education. ISBN 978-0-321-54774-3

References: Other reference materials may be posted electronically during this course.

COURSE GOALS/OUTCOMES

Students taking this course will be able to:

- Design CMOS circuits at the transistor level and use CAD tools to create the chip
- Start with a design concept at a transistor level or schematic and produce a layout
- Understand the industry standard methods of logic design and layout

Student learning outcomes would be the ability to:

- Design full custom IC VLSI design using the MAGIC CAD tool
- Design logic circuits using CMOS transistor family
- Comprehend performance issues in CMOS circuits such as power and delay
- Have an ability to create dynamic CMOS designs
- Simulate, verify, and analyze the performance of layouts

IMPORTANT DATES

Thursday January 17:

First day of classes

Monday January 21:

Alaska Civil Rights Day (no classes)

Friday February 1:

Last day to drop the class (course does not appear on academic record)

Friday March 22:

Last day to withdraw ('W' appears on academic record)

Friday April 26:

UAF SpringFest (no classes)

Monday May 6:

Last day of class

Tuesday-Friday May 7-10:

FINAL EXAMS

May 8 10:15-12:15

FINAL EXAM for VLSI

Network/Quizzes

1, 1.6, 1.8. Tristate Drawing
Install MAGIC

Work through MAGIC tutorials 1-3
Learn in series nMOS in MAGIC

Quiz 1

2.1 and custom problem

HW #4: Research

HW #5: 2.14, 2.15
Install ng-spice

Layout in MAGIC; Simulate DC
transfer

Go to Inverter layout and find delays

Quizzes

Normal Sizing in Magic

5.4, 5.7

**since carry out circuit
ted.**

9.4, 9.1

Book Sections	Homework/Quizzes
2.2	
2.3+	
Part II	
10.2.3	
9-10.2.5	
- No Class	
2.3.1	Project Part 3: Design 8-bit Ripple Carry Adder/Subtraction
2.3.2	
2; 11.1?	
1.1	

TENTATIVE SCHEDULE

42 Class Meetings = 37 Lectures + 1 Tutorial Day + 2 Exams + 2 Presentation days

FINAL EXAM: May 8 10:15-12:15

COURSE POLICIES

E-mail

Each student is expected to regularly check his or her alaska.edu email address. This address will be used for class correspondence - announcements, homework problems clarifications, etc. If you are not using the official

Attendance

Class attendance is highly recommended. Material not in the text may be introduced at random intervals and occasional quizzes are part of your grade. If you miss a class, lecture slides and other handouts are available on

Blackboard or can be obtained from the instructor. If you are late, please enter without disrupting the class.

Homework

Homework problems will typically be due the following class, unless otherwise stated. No late homework will

STUDENTS WITH DISABILITIES

Students with learning or other disabilities who may need classroom accommodations are encouraged to make an appointment with the Office of Disability Services (208 WHIT, Phone # 474-5655). Please meet with me during office hours so that we can collaborate with the Office of Disability Services to provide the appropriate accommodations and supports to assist you in meeting the goals of the course.

GRADING

Homework	15%
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Plus/Minus grading will be used.

Projects will be graded based on completion, analysis, and brief presentation. If the project chosen