Monthly Faculty Meeting
Department of Electrical Engineering

Present:	Roger Dougal, Chair	
	Mohammod Ali	Krishna Mandal
	Seongtae Bae	Enrico Santi
	MVS Chandrashekhar,	Grigory Simin
	Yinchao Chen	Guoan Wang
	Herbert Ginn	Xiaofeng Wang
	Paul Huray	Bin Zhang
	Asif Khan	
Absent:	Andrea Benigni, Charles Brice, David Matolak	
Recorder:	Nat Paterson	

The meeting was called to order by Dr. Roger Dougal at 3:30 p.m. in EE Conference Room 3A75 on September 17, 2015.

1. Announcements –
o Minutes from last month were electronically approved
o Big Friday – September 18
o S.E.T Faulty-Employer Lunch –September 22, 2015 at 11 AM at Columbia Metropolitan Convention Center
o Fall IAB Meeting – November 13, 2015
o Spring 2016 Advisement -- October 26 to November 6, 2015
  ▪ Student Services offers Advising Training. Please contact Susan Jarvie, sjarvie@cec.sc.edu
o Provide Advisement time slot availability to Nat by September 28, 2015
o Homecoming BBQ – October 17, 2015

2. Committee Reports --

I. Report of the Chair –

Reminders:

o Dean Candidates --
  ▪ The last dean candidate, Mr. Melur "Ram" Ramasubramanian, Friday September 18, 2015 –
  ▪ EE Faculty Meeting with the candidate in 1A03 at 8:45 AM
  ▪ Public Presentation at Russell House Theater at 2 PM
  ▪ Submit your input for Dean candidate evaluation -- https://www.surveymonkey.com/r/VMNYGLW
o **SPAM** – watch out, it is getting dangerous, and also may appear to replicate USC messages that also ask you to click on links. Report phishing here: phishing@sc.edu
o EE Budget – there has not yet been any funding allocation to the department
o **Committee Annual plans** still need to be updated.

Today's Focus: *Q & A on establishing departmental metrics for ourselves*

The faculty was asked to complete an anonymous survey on Blackboard on the subject of research plans and expectations. The questions were designed to gain an understanding of the faculty's short term and long term goals.

Results from the survey were presented and compared to current department metrics. The results and comments from the faculty will inform future departmental objectives and plans. Appendix A is a summary of the responses.

II. Undergraduate Committee – Dr. Simin

Topic #1: Review of Course Outcomes alignment with Program Outcomes

Dr. Simin presented the Course Outcome alignment map (See Appendix B) to the faculty. This shows how course outcomes from each course contribute to the overall Program Outcomes (A-K)

However shortly we will need to do a comprehensive review of these outcomes to ensure that

a) we are building the skills in a progressive manner
b) we are not being redundant
c) we are not leaving anything out

The measurement and collection methods for Fall 2015 were mentioned.

Motion #1: Remove Lower/Upper Division Requirement for BSE in EE

Rationale:

- The requirement is now archaic, as it was originally imposed 40 years ago to ensure that students met all general engineering requirements before choosing a major. Now students immediately enroll in their major courses (e.g. ELCT 101).
- The "quality" check that was originally performed by this requirement can now be replaced by judicious application of "C or better" prerequisites. Additional prerequisite requirements will be added to the following courses.
- ELCT 201 – will add ENGL 102 (Rhetoric and Composition) as a pre-req because the lab builds professional communication skills for which skills in the English language is a first requirement.
- ELCT 363 – will add CHEM 111 (General Chemistry I) because an understanding of basic Chemistry is essential to understanding electronic materials.
- ELCT 301 – will add as pre-req any of CSCE 146, EMCH 201, or PHYS 306 to ensure that students have sufficient knowledge in mathematics, physics, and engineering-related programming prior to taking more advanced courses in the EE major.
- Along with these additional prerequisites, the department will also add a requirement to earn "C or better" in any EE class which is a prereq for any next class.
- The limit on course repeats prevents a student from languishing unsuccessfully and indefinitely in the program, which was formerly enforced by the upper division check.
- Computer enforcement of prerequisites will eliminate the huge human time expense in manually checking upper division requirements.

Vote: All in favor

Next actions:

- The department will submit the course changes as identified by the Undergraduate Committee through the Online Academic Programs Proposal System. Changes are expected to be effective Fall 2016 pending approval by Faculty Senate.

Motion #2: In additional to CSCE 146, add these two course options to "Other General Requirements"

PHYS 306: Principles of Physics III (3credit hours) delivers topics on wave properties, geometrical and physical optics and thermodynamics essential for Electrical Engineering and not covered in other

Physics or EE courses. This course is important for students who concentrate on communications, semiconductor devices, and power electronics.

EMCH201: Numerical Methods (3 credit hours) teaches fundamentals of numerical methods and programming skills not covered in other courses taught by CSCE and EE departments. This course is important for students who concentrate on modeling and simulation of power systems, nonlinear RF systems, power and other semiconductor devices and circuits.

Rationale:

To satisfy the need for better knowledge and skills in mathematics, physics, and engineering-oriented programming languages. These courses allow the student to fine-tune their strengths according to their intended focus.

Vote: All in favor

Next actions:

- o The department will submit the program change through the Online Academic Programs Proposal System. Changes are expected to be effective Fall 2016 pending approval by Faculty Senate.

III.   **Graduate Committee – Dr. Ginn**

Topics #1: New course proposal – project-oriented course for ME Comprehensive Exam.

Current status – the New Course Proposal has been developed and will be submitted to the Graduate Council for approval.

Topic #2: Implementation of the new PhD Qualifying Exam.

New format is detailed as follows:

- **Research Areas/Topics:** Questions will focus on 4 general topic areas:
    - o Signals Systems & Controls,
    - o Circuits & Electronics,
    - o Semiconductor Devices, and
    - o Electromagnetics & Communications
- **Format:** written. There are two steps in the question selection process.
    - o Step 1, students choose 3 out of the 4 research areas.
    - o Step 2, 2 questions from the 3 selected research areas from Step 1 will be given to students by the Graduate Director.
- **Length of exam:** 3 hours
- **Questions:** The pool of questions will be provided by the faculty at the request of the Graduate Director. The questions will be graded by those who create them. Level of difficulty should not be above material covered in 500 level courses.
- **Grading Policy:** Pass/Fail on each question, and 5 out of 6 questions have to be passed in order to pass the exam.

Topic #3: Standardization of PhD Graduate Research Assistantship financial support.

- Current graduate assistantship stipends differ widely across the department, ranging from $600 per month to $2,600 per month.
- More investigation on stipends at different institutes will be conducted before the Graduate Committee proposes whether stipends should be standardized and/or raised.

Topic #4: Development of a sustainable recruiting plan to maintain the size of graduate program.

Dr. Ginn attended a meeting with the CEC executive committee regarding a company called Shorelight, a recruiting company, to learn details of a new international student recruitment plan.

The summary of the meeting and discussion are as follows:

- Shorelight recruits international students with qualifying undergraduate degrees who pay full tuition.
- Students have 2 semesters (3 courses) on campus as a pre-screening process prior to being admitted into a regular Graduate program.
- Student successfully passing the pre-screening process will be accepted into graduate non-thesis programs.
- A few very good students may be identified and directly admitted into thesis-based programs.
- This helps generate revenues for the college and the department.

See Appendix C for more details on the Master's Accelerator Program (MAP-2).

Next actions:

- o The Graduate Director will send out a request for qualifying exam questions from the faculty and an update will be presented at the next faculty meeting.
- o The Graduate Committee will present more information on the recruiting plan and financial support for graduate assistantship at the next faculty meeting

Meeting adjourned at 5:25 pm

APPENDIX A -- Departmental Metrics

Metrics	Current	Survey Responses
average number of MS students per faculty member	1.18	0-3 = 7 4-7 = 2
average number of PhD students per faculty member	2.56	0-3 = 4 4-7 = 7
average number of journal publications produced per PhD student by the time of graduation	4.75*	0-3 = 8 4-7 = 1
average annual research expenditures, as PI, per Assistant Professor	$68,846.96	$50,000 = 7 $100K = 7 $200K = 1
average annual research expenditures, as PI, per Associate Professor	$43,578.64	$50K = 1 $100K = 7 $250K 1
average annual research expenditures, as PI, per Professor	$256,907.60	$100K = 5 $300K = 4
annual research funding do you expect to originate in the next year		$100K = 4 $150K = 5
annual research funding do you expect to originate two years from now		$0 - $100 = 1 $150K = 6 $350K = 2
annual research funding do you expect to originate five years from now		$150K = 3 $350 = 5 $1M = 1
Do you foresee yourself directing a recognized research center in the next…?		4-7 = 4 8-12 = 4 Never = 1
How many proposals do you plan to submit in the next year in pursuit of your funding or center goals		0-3 = 2 4-7 = 5 8-12 = 2

APPENDIX B-- Review of Course Outcomes alignment with Program Outcomes

A - K	ABET Outcomes	Course Outcomes	Courses	Dept
G	an ability to communicate effectively	Communicate the results of lab experiments in formal lab reports, with emphasis on proper structure and formatting, and multimedia presentations.	201	ELCT
G	an ability to communicate effectively	Communicate effectively through written lab reports and technical memos, with emphasis on critical discussion of results.	301	ELCT
G	an ability to communicate effectively	Analyze data and write technical reports to summarize findings and results.	302	ELCT
G	an ability to communicate effectively	Conduct literature search, review and report findings; demonstrate teamwork and develop communication skill through group report and presentation.	363	ELCT
G	an ability to communicate effectively	Communicate effectively in the language of electronic systems, including correct understanding and use of technical terms.	371	ELCT
G	an ability to communicate effectively	Communicate the team's logistical and technical approaches to the design project in a polished, co-authored written proposal, using language and graphics appropriate to the technical discipline. Describe organizational and technical plans and progress in oral presentations, using high-quality, informative, graphical and textual elements. Succinctly report individual and team performance against the plan.	403	ELCT
G	an ability to communicate effectively	Develop a technical manual for the final product Report progress in oral presentations, using high-quality, informative, graphical and textual elements.	404	ELCT

https://sp.sc.edu/sites/cec/EE/Committees/UGC/Shared%20Documents/Assessment/ABET%20Self%20Study%20Report/AssessmentProcess/Fall2015%20MeasurementMethods.xlsx

Example of Assessment Method

ELCT 221-- Course Outcomes	Measurement Methods	ABET Outcome
solve problems on DC and AC linear circuit analysis using nodal, mesh and source transformation (Thevenin and Norton) techniques.	Test 2 (DC nodal analysis) Final exam (AC nodal analysis) Test 3 (DC mesh analysis) Final exam (AC mesh analysis) Final exam	Outcome A
find the impedance of and power in R, L, C network components.	Test 4 (impedance) Final exam (AC power)	Outcome E
use MATLAB (or equivalent) tool to solving mesh and nodal matrix equations, calculating voltages, currents, impedances and powers in linear circuits.	Test 2 (DC nodal analysis) Final exam (AC nodal analysis) Test 3 (DC mesh analysis) Final exam (AC mesh analysis) Final exam (AC Thevenin transformation)	Outcome K
use SPICE simulations to build the schematics and generate frequency dependencies of currents and voltages in linear circuits.	Test 6 (Plot the frequency dependence of the output voltage of R-L-C circuit)	Outcome K

APENDIX C -- MAP-2 Details

Master's Accelerator Program MAP-2 details (how it is proposed to work):

- Shorelight recruiters find prospects, examines academic record, converts to a 4.0 GPA scale, requires IELTS, and admits to the MAP program (but not to the Grad School).
- Departments set the minimum standard for Shorelight (but Shorelight argues for 2.5 equivalent GPA)
- First semester (prior to full Graduate Admission):
  - Students take a Professional Development Suite (language, culture, professional practices) set of courses managed by Shorelight (no CEC involvement needed)
  - Students take a <u>closed cohort</u> "Communications Bridge" (3 cr) course, aka Research Methodologies, Engineering Analysis, developed and offered by CEC. Can be an existing course, but must be offered closed cohort. Course should be applicable to the Master's degree being sought. Course is graded.