<table>
<thead>
<tr>
<th>Date Received</th>
<th>Date Forwarded</th>
<th>Comments: Approved, Approved with Revisions, Etc.</th>
<th>Signatures</th>
</tr>
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<tbody>
<tr>
<td>10/10/2013</td>
<td></td>
<td></td>
<td>James Conrad</td>
</tr>
<tr>
<td>10/10/2013</td>
<td>Approved</td>
<td></td>
<td>Ian Ferguson</td>
</tr>
<tr>
<td>4-Nov-2013</td>
<td>Approved</td>
<td></td>
<td>Wesley B. Williams</td>
</tr>
<tr>
<td>11/5/2013</td>
<td>Approved</td>
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(If applicable; for General Education courses only)

(For undergraduate courses only)

(For graduate courses only)

(faculty governance assistant (received and processed in academic affairs)
*To: Undergraduate Course and Curriculum Committee Chair

From: James Conrad

Date: October 10, 2013

Re: Establish New Course Listing-ECGR 2104

The Short Form is used for minor curriculum changes. Minor changes may include:

- Changes to course numbering (note: must follow Course Numbering Policy)
- Editorial changes to current catalog copy
- Individual new courses (undergraduate only)
- Other small changes that have limited to no impact on other departments or units

Submission of this Short Form indicates review and assessment of the proposed curriculum changes at the department and collegiate level either separately or as part of ongoing assessment efforts.

*Proposals for undergraduate courses should be sent to the Undergraduate Course and Curriculum Committee Chair. Proposals related to both undergraduate and graduate courses, (e.g., courses co-listed at both levels) must be sent to both the Undergraduate Course and Curriculum Committee and the Graduate Council.
**SUMMARY:** State clearly and concisely the proposed changes. Please give a brief statement as to why the change is being proposed.

Ex. “The Biology Department proposes to add a prerequisite to the existing course, BIOL 2222.”

Ex. “The College of Information Technology proposes a change in the course description for ITCS 6132.”

The Electrical and Computer Engineering Department would like to establish ECGR 2104: “Computer Engineering Programming II” as a new course listing to follow ECGR 2103: “Computer Utilization in C++” in the Course Catalog. This course will be engineering-centric. No other course exists that addresses computer engineering programming design concepts.

**FOR CONSULTATION WITH OTHER DEPARTMENTS:**

1. Does the proposed change affect other departments (including additions and/or changes to degree requirements or prerequisites offered in other departments)?
   
   [ ] Yes  [x] No

2. If Yes, please list the other departments affected by the proposed change:

3. Have you consulted with each department listed in item 2 regarding the proposed change?

   [ ] Yes  [ ] No

Result(s) of Consultation(s) (please attach documentation):

For a new course or for major modification of an existing course, include Consultation on Library Holdings.

**RESOURCES:**

1. For a new course or revisions to an existing course, check all the statements that apply:

   [ ] This course will be cross listed with another course.
   [x] There are prerequisites for this course.
   [ ] There are co-requisites for this course.
   [ ] This course is repeatable for credit.
   [ ] This course will affect the number of credits hours for its program.
   [ ] This proposal results in the deletion of an existing course(s) from the degree program and/or catalog.
   [ ] This proposal will alter an agreement with a North Carolina community college.

For all items checked above, applicable statements and content must be reflected in the proposed catalog copy.

Revised 12/18/12
OAA/mjw
2. Indicate the additional resources required, if any, to implement and maintain the proposed change.

**CREDIT HOUR (Mandatory if new and/or revised course in proposal):**
Review statement and check box once completed.
X - The appropriate faculty committee has reviewed the course outline/syllabus and has determined that the assignments are sufficient to meet the University definition of a credit hour.

**PROPOSED CATALOG COPY:** For existing courses copy and paste the current catalog copy and use the Microsoft Word “track changes” feature (or use red text with “strikethrough” formatting for text to be deleted, and adding blue text with “underline” formatting for text to be added). For new courses, draft comprehensive catalog copy.

**Catalog description**

ECGR 2104: Computer Engineering Programming II. (3) Prerequisite: ECGR 2103 or equivalent. The focus of this course is on advanced topics in C++. The course covers pointers, recursion, inheritance, polymorphism, and templates. Furthermore, it introduces students to linked data structures and analysis of algorithms.

**Prerequisite:** ECGR 2103 or equivalent

**Semesters offered:** Spring, Summer
ACADEMIC PLAN OF STUDY (UNDERGRADUATE ONLY): If the proposed change will impact an existing Academic Plan of Study, provide updated Academic Plan of Study in template format.

STUDENT LEARNING OUTCOMES: If applicable, please indicate what SLOs are supported by this course or whether this curricular change requires a change in SLOs or assessment for the degree program.

This course will not be measure using SACS SLO, but will be measured using the Engineering Accreditation (ABET) SLOs:

1. Understand object-oriented design and programming. (ABET outcome e)
2. Understand dynamic memory allocation and pointers. (ABET outcome e)
3. Understand linked data structures. (ABET outcome e)
4. Ability to perform elementary analysis of algorithms. (ABET outcome e)
5. Ability to design, implement, and test relatively large C++ programs in an Integrated Development Environment. (ABET outcome k)

TEXTBOOK COSTS: It is the policy of the Board of Governors to reduce textbook costs for students whenever possible. Have electronic textbooks, textbook rentals, or the buyback program been considered and adopted?


This book is also used for ECGR2103

IMPORTANT NOTE: A Microsoft Word version of the final course and curriculum proposal should be sent to facultygovernance@uncc.edu upon approval by the Undergraduate Course and Curriculum Committee and/or Graduate Council chair.
ECGR 2104, Advanced Computer Utilization in C++

Catalog description

The focus of this course is on advanced topics in C++. The course covers pointers, recursion, inheritance, polymorphism, and templates. Furthermore, it introduces students to linked data structures and analysis of algorithms.

Perquisite: ECGR 2103 or equivalent

Semesters offered: Spring, Summer

Professor: Dr. Arun A. Ravindran Office: EPIC 2167 arun.ravindran@uncc.edu

Office hours: TBD

Teaching Assistants: TBD

Lecture Time and location: TBD

Final Exam: TBD


Grading: Assignments- 20% Midterm (2) – 40% Final Exam – 20 % Project – 20%

Make up policy: Only for absences with prior approval. Contact professor ahead of time.

Late submission of homework: Zero credit

Attendance: Compulsory

Class Topics:

1. Pointers and Dynamic Arrays
2. Recursion
3. Inheritance
4. Polymorphism and Virtual Functions
5. Templates
6. Linked Data Structures
7. Introduction to Analysis of Algorithms
8. Exception Handling
9. Standard Template Library
Course Outcomes

1. Understand object-oriented design and programming. (ABET outcome e)
2. Understand dynamic memory allocation and pointers. (ABET outcome e)
3. Understand linked data structures. (ABET outcome e)
4. Ability to perform elementary analysis of algorithms. (ABET outcome e)
5. Ability to design, implement, and test relatively large C++ programs in an Integrated Development Environment. (ABET outcome k)

Exams, homework and project will test student performance on these outcomes

Academic Integrity Statement

All UNC Charlotte students have the responsibility to be familiar with and to observe the requirements of The UNC Charlotte Code of Student Academic Integrity (see the Catalog). This Code forbids cheating, fabrication or falsification of information, multiple submission of academic work, plagiarism, abuse of academic materials (such as Library books on reserve), and complicity in academic dishonesty (helping others to violate the Code). Any further specific requirements or permission regarding academic integrity in this course will be stated by the instructor, and are also binding on the students in this course. Students who violate the Code can be punished to the extent of being permanently expelled from UNC Charlotte and having this fact recorded on their official transcripts. The normal penalty is zero credit on the work involving dishonesty and further substantial reduction of the course grade. In almost all cases, the course grade is reduced to "F." If you do not have a copy of the Code, you can obtain one from the Dean of Students Office or access it online at www.legal.uncc.edu/policies/ps-105.html. Standards of academic integrity will be enforced in this course. Students are expected to report cases of academic dishonesty they become aware of to the course instructor who is responsible for dealing with them.

Diversity Statement

UNC Charlotte strives to create an academic climate in which the dignity of all individuals is respected and maintained. Therefore, we celebrate diversity that includes, but is not limited to ability/disability, age, culture, ethnicity, gender, language, race, religion, sexual orientation, and socio-economic status.
Consultation on Library Holdings

To: Jim Conrad
From: Alison Bradley
Date: 10/10/13

Subject: ECEG 2104 – Advanced Computer Utilization in C++

Summary of Librarian's Evaluation of Holdings:

Evaluator: Date:

Check One:
1. Holdings are superior
2. Holdings are adequate
3. Holdings are adequate only if Dept. purchases additional items.
4. Holdings are inadequate

Comments:
Library holdings should be adequate to support student research for this course, as it has does not require any independent research. If students seek additional material to support their classwork, the following holdings may be relevant.

<table>
<thead>
<tr>
<th>LC Subject Heading</th>
<th>Total Items held</th>
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<tbody>
<tr>
<td>C++ (Computer program language)</td>
<td>230</td>
</tr>
<tr>
<td>Recursion theory</td>
<td>220</td>
</tr>
<tr>
<td>Object-oriented programming (Computer science)</td>
<td>226</td>
</tr>
</tbody>
</table>

Alison Bradley

Evaluator's Signature

10/10/13

Date
# Computer Engineering Academic Plan of Study (**PROPOSED**)

## Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 1101 English Composition</td>
<td>ENGL 1102 Writing in the Academic Community</td>
</tr>
<tr>
<td>ENGR 1201 Engineering Practices &amp; Prin. I</td>
<td>ENGR 1202 Intro. to Engineering Practices &amp; Prin. II</td>
</tr>
<tr>
<td>CHEM 1251 Principles of Chemistry</td>
<td>PHYS 2101 Physics for Science and Engineering I</td>
</tr>
<tr>
<td>CHEM 1251L Principles of Chemistry Lab</td>
<td>PHYS 2101L Laboratory</td>
</tr>
<tr>
<td>MATH 1241 Calculus I</td>
<td>MATH 1242 Calculus II</td>
</tr>
<tr>
<td>ECGR 2103 Computer Utilization in C++</td>
<td>ECGR 2104 Computer Engineering Programming II</td>
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</table>

Semester hours = 15

## Sophomore Year

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>ECGR 2111 Network Theory I</td>
<td>ECGR 2112 Network Theory II</td>
</tr>
<tr>
<td>ECGR 2155 Instrumentation and Networks Lab</td>
<td>ECGR 2156 Logic and Networks Laboratory</td>
</tr>
<tr>
<td>ECGR 2181 Logic System Design I</td>
<td>ECGR 3181 Logic System Design II</td>
</tr>
<tr>
<td>MATH 2171 Differential Equations</td>
<td>MATH 1165 Intro. to Discrete Structures</td>
</tr>
<tr>
<td>PHYS 2102 Physics for Science and Engineering II</td>
<td>STAT 2122 Probability and Statistics</td>
</tr>
<tr>
<td>PHYS 2102L Laboratory</td>
<td>ECON 2101 Principles of Economics Macro</td>
</tr>
<tr>
<td>LBST 110x The Arts and Society</td>
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</tbody>
</table>

Semester hours = 17

## Junior Year

<table>
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<tr>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td>ECGR 3111 Signals and Systems</td>
<td>ECGR 2255 Digital Design Laboratory</td>
</tr>
<tr>
<td>ECGR 3131 Fundamentals of Electronics/Semiconductors</td>
<td>ECGR 3123 Data Communications &amp; Networking</td>
</tr>
<tr>
<td>ECGR 3155 Systems and Electronics Lab</td>
<td>ECGR 3132 Electronics</td>
</tr>
<tr>
<td>ENGR 3295 Professional Development</td>
<td>Math or Science Restricted Elective*</td>
</tr>
<tr>
<td>ECGR 3183 Computer Org and Programming Languages</td>
<td>Advanced Problem Solving*</td>
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<tr>
<td>LBST 2101 Western Culture and Historical Aware.</td>
<td>LBST 2102 Global and Intercultural Connections</td>
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<tr>
<td>LBST 221x Liberal Studies Elective</td>
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</table>

Semester hours = 17

## Senior Year

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>ECGR 3253 Senior Design I</td>
<td>ECGR 3254 Senior Design II</td>
</tr>
<tr>
<td>2xxx Level Writing Intensive</td>
<td>ECGR 3159 Professional Practice</td>
</tr>
<tr>
<td>ECGR 4101 Embedded Systems</td>
<td>ECGR 4124 Digital Signal Processing</td>
</tr>
<tr>
<td>ECGR 4146 Intro to VHDL</td>
<td>Depth Elective #2*</td>
</tr>
<tr>
<td>Depth Elective #1*</td>
<td>Restricted Elective*</td>
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</table>

Semester hours = 14

**Total hours = 125**

**ECGR 2103 and ECGR 2104 new course listings for CPGR majors beginning Fall 2012.**

*See Depth-Science/Math-Restricted Electives Form for courses that are permitted*