Contact Name: Renee McCauley     Email: mccauleyr@cofc.edu     Phone: 953-3187

Department Name: Computer Science   Graduate Program name: Computing and Information Sciences

Course Prefix, Number, and Title: CSIS 612 Advanced Computer Architecture

I. CATEGORY OF REVIEW (Check all that apply)

☐ New Course (attach syllabus*)    ☐ Change Number (IV, VII, VIII, IX)    ☐ Delete Course (IV, VII, IX)
☐ Change Title (IV, VII, VIII, IX)
☐ Change Credits/Contact hours (II, IV, VII, IX)
☒ Prerequisite Change (IV, VII, VIII, IX)
☒ Edit Description (III, IV, VII, VIII, IX)
☐ Approve for Cross-listing (attach Graduate Permission to Cross-list Form)

Date (Semester/Year) the course will first be offered, course changes or deletion will go into effect: Fall 2013

NEW COURSE:

*ATTACH THE SYLLABUS FOR A NEW GRADUATE COURSE to include:

- Course description and objectives
- Method of teaching (e.g., lecture, seminar, on-line, hybrid)
- Required and optional texts and materials
- Graduate School Grading Scale
- Assignments, student learning outcomes and assessment components
- Policies to include attendance, Honor Code, American Disabilities Act statement
- Tentative course schedule with specific topics
List prerequisites and/or other restrictions below

CSIS 604 or permission of department.

Will this course be added to the Degree Requirements?

a) ☐ Yes ☒ No

b) If yes, explain

NO. This course is currently a specialization elective in the CS track or a general elective in the other tracks and it will continue to serve this purpose. No change in its status within the degree requirements.

II. NUMBER OF CREDITS and CONTACT HOURS per week

<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Lab</th>
<th>Seminar</th>
<th>Ind. Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Contact Hours</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Credit Hours</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Is this course repeatable? ☐ yes ☒ no If so, how many credit hours may the student earn in this course?

III. CATALOG DESCRIPTION Limit to 50 words EXACTLY as you want it to appear in the catalog; include prerequisites, co-requisites, and other restrictions. If changing course description, please include both old and new course descriptions.

OLD description with prerequisites:
Currently, the trend in parallel computing is moving away from specialized, super-computing architectures, such as the Cray/SGI T3E, to less expensive, general-purpose systems consisting of loosely coupled components built from the PCs. We will study various topics relevant to clustering, including the following: interconnection networks, protocols, high performance I/O, load balancing, availability, programming models and environments, parallel algorithms and applications. The course will be lab-intensive and will include the implementation of parallel algorithms on a Beowulf Cluster.

Prerequisites: CSIS 340 and CSIS 604 or their equivalents.
NEW description with prerequisites:
This course covers various topics relevant to clustering including the following: interconnection networks, protocols, high performance I/O, load balancing, availability, programming models and environments, parallel algorithms and applications. The course will be lab intensive and will include the implementation of parallel algorithms on a Beowulf Cluster.
Prerequisite: CSIS 604 or permission of department.

IV. RATIONALE / JUSTIFICATION: If course change – please indicate the course change details. If course change or deletion—please provide reasons for change(s) to or deletion of a course. If a new course—briefly address the goals/objectives for the course and the relationship to the strategic plan.

This course is part of a joint program offered through CoC and the Citadel. The purpose of the change is to bring our catalog description and prerequisites into compliance with those of the Citadel.

V. STUDENT LEARNING OUTCOMES and ASSESSMENT

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Method and Performance Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>What will students know and be able to do when they complete the course?</td>
<td></td>
</tr>
<tr>
<td>1. Understand pipelining, instruction set architectures, memory addressing.</td>
<td>Test questions will require students to show this understanding. 80% or better expected.</td>
</tr>
<tr>
<td>2. Understand the performance metrics of microprocessors, memory, networks, and disks</td>
<td>Test questions will require students to show this understanding. 80% or better expected.</td>
</tr>
<tr>
<td>3. Understand the various techniques to enhance a processor's ability to exploit Instruction-level parallelism</td>
<td>Test questions will require students to show this understanding. 80% or better expected.</td>
</tr>
<tr>
<td>4. Understand exploiting ILP using dynamic scheduling, multiple issue, and speculation.</td>
<td>Test questions will require students to show this understanding. 80% or better expected.</td>
</tr>
<tr>
<td>5. Understand multithreading by using ILP and supporting thread-level parallelism (TLP).</td>
<td>Test questions will require students to show this understanding. 80% or better expected.</td>
</tr>
<tr>
<td>6. Understand the performance and efficiency in advanced multiple-issue processors.</td>
<td>Test questions will require students to show this understanding. 80% or better expected.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>7. Understand symmetric shared-memory architectures and their performance.</td>
<td>Test questions will require students to show this understanding. 80% or better expected.</td>
</tr>
<tr>
<td>8. Understand multiprocessor cache coherence using the directory based and snooping class of protocols.</td>
<td>Test questions will require students to show this understanding. 80% or better expected.</td>
</tr>
<tr>
<td>9. Understand storage systems, RAID, I/O performance, and reliability measures.</td>
<td>Test questions will require students to show this understanding. 80% or better expected.</td>
</tr>
</tbody>
</table>

How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?

This course supports the program outcome: Students will acquire depth in an area of specialization (computer science, information systems, or software engineering) appropriate for a professional graduate degree and compatible with local needs.

Is the content or skill introduced, reinforced, or demonstrated in this course? Yes.

**VII. IMPACT ON EXISTING PROGRAMS and COURSES:** Please briefly document the impact and expected changes of this new/changed/deleted course on other departments, programs and courses; if deleting a course—list all departments and programs that include the course; if adding/changing a course—explain any overlap with existing courses in the same or different departments; if adding or deleting a course that will be part of a joint program identify the partner institution.

NONE.

**VIII. COSTS ASSOCIATED WITH THE ACTION REQUESTED:** List all of the new costs or cost savings, (including new faculty/staff requests, library or equipment, etc.) associated with the action requested. New courses requiring additional resources will need special justification.

NONE.
IX. APPROVAL AND SIGNATURES

Signature of Program Director:

Date: August 12, 2012

Signature of Department Chair:

Date: 10-3-12

Signature of Additional Chair*:

Date: __________________

Signature of Schools’ Dean:

Date: 10/10/12

Signature of Additional Schools’ Dean*:

Date: __________________

Signature of the Provost:

Date: 10/23/12

Signature of Budget Director/Business Affairs Office:

Date: 10/23/12

*For interdisciplinary courses

Return form to the Graduate School Office for Further Processing

Signature of Chair of the Faculty Committee on Graduate Education, Continuing Education & Special Programs:

Date: 11/9/2012

Signature of Chair of the Graduate Council:

Date: 11/12/12

Signature of Faculty Senate Secretary:

Date: __________________

Date Approved by Faculty Senate: __________________
Contact Name: Renee McCauley   Email: mccauleyr@cofc.edu   Phone: 953-3187

Department Name: Computer Science   Graduate Program name: Computing and Information Sciences

Course Prefix, Number, and Title: CSIS 614 Advanced Operating Systems

I. CATEGORY OF REVIEW (Check all that apply)

NEW COURSE  CHANGE COURSE  DELETE COURSE

☐ New Course (attach syllabus*)  ☐ Change Number (IV, VII, VIII, IX)  ☐ Delete Course (IV, VII, IX)
☐ Change Title (IV, VII, VIII, IX)
☐ Change Credits/Contact hours (II, IV, VII, IX)
☒ Prerequisite Change (IV, VII, VIII, IX)
☐ Edit Description (III, IV, VII, VIII, IX)

☐ Approve for Cross-listing (attach Graduate Permission to Cross-list Form)

Date (Semester/Year) the course will first be offered, course changes or deletion will go into effect: Fall 2013

NEW COURSE:

*ATTACH THE SYLLABUS FOR A NEW GRADUATE COURSE to include:

- Course description and objectives
- Method of teaching (e.g., lecture, seminar, on-line, hybrid)
- Required and optional texts and materials
- Graduate School Grading Scale
- Assignments, student learning outcomes and assessment components
- Policies to include attendance, Honor Code, American Disabilities Act statement
- Tentative course schedule with specific topics

September 2011
List prerequisites and / or other restrictions below

CSIS 604 or permission of department

Will this course be added to the Degree Requirements?

a) ☐ Yes  ☒ No

b) If yes, explain

II. NUMBER OF CREDITS and CONTACT HOURS per week

<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Lab</th>
<th>Seminar</th>
<th>Ind. Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Contact Hours</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

B. Credit Hours  3

Is this course repeatable? ☐ yes  ☒ no  If so, how many credit hours may the student earn in this course?

III. CATALOG DESCRIPTION Limit to 50 words EXACTLY as you want it to appear in the catalog: include prerequisites, co-requisites, and other restrictions. If changing course description, please include both old and new course descriptions.

This course covers a broad range of advanced operating systems concepts including protection, security, memory management, kernels, file systems, synchronization, naming, networks, and distributed systems as well as recent trends in operating systems design. Specific aspects of operating systems which support distributed computing will be emphasized.

Prerequisite: CSIS 604 and an undergraduate course in operating systems.

IV. RATIONALE / JUSTIFICATION: If course change – please indicate the course change details. If course change or deletion—please provide reasons for change(s) to or deletion of a course. If a new course—briefly address the goals/objectives for the course and the relationship to the strategic plan.

September 2011
This course is part of a joint program offered through CofC and the Citadel. The purpose of the change is to bring our catalog description and prerequisites into compliance with those of the Citadel.

V. STUDENT LEARNING OUTCOMES and ASSESSMENT

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Method and Performance Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>What will students know and be able to do when they complete the course?</td>
<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students be able to do on the assessment?</td>
</tr>
<tr>
<td>1. Understand fundamental operating system abstractions such as processes, threads, files, semaphores, inter-process communication, shared memory regions, etc.,</td>
<td>Measured through grades on programming projects: score of 80% or better indicates satisfaction of outcome.</td>
</tr>
<tr>
<td>2. Understand how the operating system abstractions can be used in the development of application programs, or to build higher level abstractions,</td>
<td>Measured through grades on programming projects: score of 80% or better indicates satisfaction of outcome.</td>
</tr>
<tr>
<td>3. Understand how the operating system abstractions can be implemented,</td>
<td>Measured through grades on programming projects: score of 80% or better indicates satisfaction of outcome.</td>
</tr>
<tr>
<td>4. Understand the principles of concurrency and synchronization, and apply them to write correct concurrent programs/software,</td>
<td>Measured through grades on programming projects: score of 80% or better indicates satisfaction of outcome.</td>
</tr>
<tr>
<td>5. Understand basic resource management techniques (scheduling or time management, space management) and principles and how they can be implemented. These also include issues of performance and fairness objectives, avoiding deadlocks, as well as security and protection.</td>
<td>Measured through grades on programming projects: score of 80% or better indicates satisfaction of outcome.</td>
</tr>
</tbody>
</table>

How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?

This course supports the program outcome: Students will acquire depth in an area of specialization ( computer science, information systems, or software engineering ) appropriate for a professional graduate degree and compatible with local needs.

Is the content or skill introduced, reinforced, or demonstrated in this course? Yes.

VII. IMPACT ON EXISTING PROGRAMS and COURSES: Please briefly document the impact and expected changes of this new/changed/deleted course on other departments, programs and courses; if deleting a course—list all departments and programs that include the course; if adding/changing a course—explain any
overlap with existing courses in the same or different departments; if adding or deleting a course that will be part of a joint program identify the partner institution.

NONE.

VIII. COSTS ASSOCIATED WITH THE ACTION REQUESTED: List all of the new costs or cost savings, (including new faculty/staff requests, library or equipment, etc.) associated with the action requested. New courses requiring additional resources will need special justification.

NONE.
IX. APPROVAL AND SIGNATURES

Signature of Program Director:  
_________________________________________________________ Date: 8-7-2012

Signature of Department Chair:  
_________________________________________________________ Date: 9-13-12

Signature of Additional Chair*:  
_________________________________________________________ Date: 

Signature of Schools' Dean:  
_________________________________________________________ Date: 10/10/12

Signature of Additional Schools' Dean*:  
_________________________________________________________ Date: 

Signature of the Provost:  
_________________________________________________________ Date: 10/22/12

Signature of Director/Business Affairs Office:  
_________________________________________________________ Date: 10-23-12

*For interdisciplinary courses

Return form to the Graduate School Office for Further Processing

Signature of Chair of the Faculty Committee on Graduate Education, Continuing Education & Special Programs:  
_________________________________________________________ Date: 11/12/12

Signature of Chair of the Graduate Council:  
_________________________________________________________ Date: 11/12/12

Signature of Faculty Senate Secretary:  
_________________________________________________________ Date:

Date Approved by Faculty Senate:  
_________________________________________________________
Contact Name: Renee McCauley  Email: mcauleyr@cofc.edu  Phone: 953-3187

Department Name: Computer Science  Graduate Program name: Computing and Information Sciences

Course Prefix, Number, and Title: CSIS 618 Programming Languages

I. CATEGORY OF REVIEW (Check all that apply)

NEW COURSE   CHANGE COURSE   DELETE COURSE

☐ New Course (attach syllabus*)  ☐ Change Number (IV, VII, VIII, IX)  ☐ Delete Course (IV, VII, IX)
☒ Change Title (IV, VII, VIII, IX)
☐ Change Credits/Contact hours (II, IV, VII, IX)
☐ Prerequisite Change (IV, VII, VIII, IX)
☒ Edit Description (III, IV, VII, VIII, IX)

☐ Approve for Cross-listing (attach Graduate Permission to Cross-list Form)

Date (Semester/Year) the course will first be offered, course changes or deletion will go into effect: Fall 2013

NEW COURSE:

*ATTACH THE SYLLABUS FOR A NEW GRADUATE COURSE to include:

- Course description and objectives
- Method of teaching (e.g., lecture, seminar, on-line, hybrid)
- Required and optional texts and materials
- Graduate School Grading Scale
- Assignments, student learning outcomes and assessment components
- Policies to include attendance, Honor Code, American Disabilities Act statement
- Tentative course schedule with specific topics
List prerequisites and/or other restrictions below

None.

Will this course be added to the Degree Requirements?

a) ☐ Yes  ❑ No

b) If yes, explain

It is an elective and will remain as such.

II. NUMBER OF CREDITS and CONTACT HOURS per week

A. Contact Hours

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Lab</th>
<th>Seminar</th>
<th>Ind. Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B. Credit Hours 3

Is this course repeatable? ☐ yes  ❑ no  If so, how many credit hours may the student earn in this course?

III. CATALOG DESCRIPTION Limit to 50 words EXACTLY as you want it to appear in the catalog; include prerequisites, co-requisites, and other restrictions. If changing course description, please include both old and new course descriptions.

OLD title: Principles of Programming Languages

NEW title: Programming Languages

OLD description: The course surveys the principles of programming language design and the issues related to their implementation. Topics will include a comparison of the major programming paradigms: imperative, functional, logic, and object-oriented. Also covered are data types, methods of specifying the semantics of language constructs and concurrency.

September 2011
**NEW description:**
This course surveys the principles of programming language design and the issues related to their implementation. Topics will include a comparison of the major programming paradigms: imperative, functional, logic, and object-oriented. Also covered are data types, methods of specifying the semantics of language constructs, and concurrency.

**IV. RATIONALE / JUSTIFICATION:** *If course change – please indicate the course change details. If course change or deletion—please provide reasons for change(s) to or deletion of a course. If a new course—briefly address the goals/objectives for the course and the relationship to the strategic plan.*

This course is part of a joint program offered through CofC and the Citadel. The purpose of the change is to bring our catalog description and prerequisites into compliance with those of the Citadel.

**V. STUDENT LEARNING OUTCOMES and ASSESSMENT**

<table>
<thead>
<tr>
<th><strong>Student Learning Outcomes</strong></th>
<th><strong>Assessment Method and Performance Expected</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>What will students know and be able to do when they complete the course?</td>
<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students be able to do on the assessment?</td>
</tr>
<tr>
<td>1. Use formal language concepts such as grammars and regular expressions to specify programming languages constructs.</td>
<td>Assessment will involve test and final exam questions on topic. Students should score 80% or better on these questions.</td>
</tr>
<tr>
<td>2. Implement front-end components of a compiler or interpreter.</td>
<td>Students will implement lexer, scanner and semantic analysis components using language recognition tools. Students should score an 80% or better on these assignments.</td>
</tr>
<tr>
<td>3. Apply notations for describing language syntax.</td>
<td>Assessment will involve test and final exam questions on topic. Students should score 80% or better on these questions.</td>
</tr>
<tr>
<td>4. Compare the language paradigms, including imperative, object-oriented, functional, and logic programming paradigms.</td>
<td>Assessment will involve test and final exam questions on topic. Students should score 80% or better on these questions.</td>
</tr>
</tbody>
</table>

How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support?

This course supports the program outcome: Students will acquire depth in an area of specialization (computer science, information systems, or software engineering) appropriate for a professional graduate degree and compatible with local needs.

Is the content or skill introduced, reinforced, or demonstrated in this course? Yes.
VII. IMPACT ON EXISTING PROGRAMS and COURSES: Please briefly document the impact and expected changes of this new/changed/deleted course on other departments, programs and courses; if deleting a course—list all departments and programs that include the course; if adding/changing a course—explain any overlap with existing courses in the same or different departments; if adding or deleting a course that will be part of a joint program identify the partner institution.

NONE.

VIII. COSTS ASSOCIATED WITH THE ACTION REQUESTED: List all of the new costs or cost savings, (including new faculty/staff requests, library or equipment, etc.) associated with the action requested. New courses requiring additional resources will need special justification.

NONE.
IX. APPROVAL AND SIGNATURES

Signature of Program Director:

[Signature] Date: August 12, 2012

Signature of Department Chair:

[Signature] Date: 9-10-12

Signature of Additional Chair*:

[Signature] Date:

Signature of Schools' Dean:

[Signature] Date: 10/10/12

Signature of Additional Schools' Dean*:

[Signature] Date:

Signature of the Provost:

[Signature] Date: 10/03/12

Signature of Budget Director/Business Affairs Office:

[Signature] Date: 10/23/12

*For interdisciplinary courses

Return form to the Graduate School Office for Further Processing

Signature of Chair of the Faculty Committee on Graduate Education, Continuing Education & Special Programs:

[Signature] Date: 11/9/2012

Signature of Chair of the Graduate Council:

[Signature] Date: 11/12/12

Signature of Faculty Senate Secretary:

[Signature] Date:

Date Approved by Faculty Senate:

_________________________
Contact Name: Renee McCauley    Email: mccauleyr@cofc.edu    Phone: 953-3187

Department Name: Computer Science   Graduate Program name: Computing and Information Sciences

Course Prefix, Number, and Title: CSIS 632 Data Communications and Networking

I. CATEGORY OF REVIEW (Check all that apply)

<table>
<thead>
<tr>
<th>NEW COURSE</th>
<th>CHANGE COURSE</th>
<th>DELETE COURSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ New Course (attach syllabus*)</td>
<td>☐ Change Number (IV, VII, VIII, IX)</td>
<td>☐ Delete Course (IV, VII, IX)</td>
</tr>
<tr>
<td></td>
<td>☐ Change Title (IV, VII, VIII, IX)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ Change Credits/Contact hours (II, IV, VII, IX)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☐ Prerequisite Change (IV, VII, VIII, IX)</td>
<td>☐ Edit Description (III, IV, VII, VIII, IX)</td>
</tr>
</tbody>
</table>

☐ Approve for Cross-listing (attach Graduate Permission to Cross-list Form)

Date (Semester/Year) the course will first be offered, course changes or deletion will go into effect: Fall 2013

NEW COURSE:

*ATTACH THE SYLLABUS FOR A NEW GRADUATE COURSE to include:

- Course description and objectives
- Method of teaching (e.g., lecture, seminar, on-line, hybrid)
- Required and optional texts and materials
- Graduate School Grading Scale
- Assignments, student learning outcomes and assessment components
- Policies to include attendance, Honor Code, American Disabilities Act statement
- Tentative course schedule with specific topics
List prerequisites and / or other restrictions below

Will this course be added to the Degree Requirements?

a) ☐ Yes  ☒ No

b) If yes, explain

No change in status – this course is already required in the IS specialization and an elective in the other specializations. These will not change.

II. NUMBER OF CREDITS and CONTACT HOURS per week

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Lab</th>
<th>Seminar</th>
<th>Ind. Study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A. Contact Hours 3

B. Credit Hours 3

Is this course repeatable? ☐ yes  ☒ no  If so, how many credit hours may the student earn in this course?

III. CATALOG DESCRIPTION Limit to 50 words EXACTLY as you want it to appear in the catalog; include prerequisites, co-requisites, and other restrictions. If changing course description, please include both old and new course descriptions.

OLD:
An introduction to data communications and computer networking. Topics include LAN topologies, transmission media, error detection, packet switching networks, Internet working of heterogeneous network technologies, Internet working protocol suites (with emphasis on TCP/IP), the client/server paradigm, the BSD socket interface, network security, and important network applications.

NEW:
An introduction to data communications and computer networking. Topics include LAN topologies, transmission media, error detection, packet switching networks, Internetworking of heterogeneous network technologies, Internet protocol suites (with emphasis on TCP/IP), the client/server paradigm, the BSD socket interface, network security, and network applications.
IV. RATIONALE / JUSTIFICATION: If course change – please indicate the course change details. If course change or deletion—please provide reasons for change(s) to or deletion of a course. If a new course—briefly address the goals/objectives for the course and the relationship to the strategic plan.

Fix errors in terminology and formatting and bring into compliance with the Citadel catalog (as this course is part of a joint program offered through CoC and the Citadel).

V. STUDENT LEARNING OUTCOMES and ASSESSMENT

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Method and Performance Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>What will students know and be able to do when they complete the course?</td>
<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students be able to do on the assessment?</td>
</tr>
<tr>
<td>1. Demonstrate an understanding of the concepts of the functionalities of the different layers on network in the OSI architecture.</td>
<td>Assessment will involve in-class exam questions on topic. Students should score 80% or better on these questions.</td>
</tr>
<tr>
<td>2. Understand the concepts of packet-switched and circuit-switched network and analyze the designs of different network protocols.</td>
<td>Assessment will involve in-class exam questions on topic. Students should score 80% or better on these questions.</td>
</tr>
<tr>
<td>3. Design and implement client/server applications using BSD sockets API.</td>
<td>Assessment will involve programming assignments. Students should score 80% or better on these assignments.</td>
</tr>
<tr>
<td>4. Understand the concepts of communication over heterogeneous network technologies and Internet protocol suites (with emphasis on TCP/IP)</td>
<td>Assessment will involve in-class exam questions on topic. Students should score 80% or better on these questions.</td>
</tr>
</tbody>
</table>

How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?
VII. IMPACT ON EXISTING PROGRAMS and COURSES: Please briefly document the impact and expected changes of this new/changed/deleted course on other departments, programs and courses: if deleting a course—list all departments and programs that include the course; if adding/changing a course—explain any overlap with existing courses in the same or different departments; if adding or deleting a course that will be part of a joint program identify the partner institution.

NONE.

VIII. COSTS ASSOCIATED WITH THE ACTION REQUESTED: List all of the new costs or cost savings, (including new faculty/staff requests, library or equipment, etc.) associated with the action requested. New courses requiring additional resources will need special justification.

NONE.
IX. APPROVAL AND SIGNATURES

Signature of Program Director:

_____________ Date: August 12, 2012

Signature of Department Chair:

________________ Date: 9-10-12

Signature of Additional Chair*:

___________ Date: __________

Signature of Schools’ Dean:

________________ Date: 10/10/12

Signature of Additional Schools’ Dean*:

________________ Date: __________

Signature of the Provost:

________________ Date: 10/20/12

Signature of Budget Director/Business Affairs Office:

___________ Date: 10-23-12

*For interdisciplinary courses

Return form to the Graduate School Office for Further Processing

Signature of Chair of the Faculty Committee on Graduate Education, Continuing Education & Special Programs:

________________ Date: 11/9/12

Signature of Chair of the Graduate Council:

________________ Date: 11/12/12

Signature of Faculty Senate Secretary:

________________ Date: __________

Date Approved by Faculty Senate: __________________________

September 2011
Contact Name: Renee McCauley   Email: mccauleyr@cofc.edu  Phone: 953-3187

Department Name: Computer Science  Graduate Program name: Computing and Information Sciences

Course Prefix, Number, and Title: CSIS 638 Advanced Topics in Database Systems

I. CATEGORY OF REVIEW (Check all that apply)

NEW COURSE  CHANGE COURSE  DELETE COURSE

☐ New Course (attach syllabus*)  ☐ Change Number (IV, VII, VIII, IX)  ☐ Delete Course (IV, VII, IX)

☐ Change Title (IV, VII, VIII, IX)

☐ Change Credits/Contact hours (II, IV, VII, IX)

☐ Prerequisite Change (IV, VII, VIII, IX)

☐ Edit Description (III, IV, VII, VIII, IX)

☐ Approve for Cross-listing (attach Graduate Permission to Cross-list Form)

Date (Semester/Year) the course will first be offered, course changes or deletion will go into effect: Fall 2013

NEW COURSE:

*ATTACH THE SYLLABUS FOR A NEW GRADUATE COURSE to include:

- Course description and objectives
- Method of teaching (e.g., lecture, seminar, on-line, hybrid)
- Required and optional texts and materials
- Graduate School Grading Scale
- Assignments, student learning outcomes and assessment components
- Policies to include attendance, Honor Code, American Disabilities Act statement
- Tentative course schedule with specific topics
List prerequisites and / or other restrictions below

CSIS 601

Will this course be added to the Degree Requirements?

  a) ☐ Yes    ☑ No

  b) If yes, explain

This course continues to serve as an elective.

II. NUMBER OF CREDITS and CONTACT HOURS per week

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Lab</th>
<th>Seminar</th>
<th>Ind. Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Contact Hours</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B. Credit Hours

3

Is this course repeatable? ☐ yes    ☑ no  If so, how many credit hours may the student earn in this course?

III. CATALOG DESCRIPTION Limit to 50 words EXACTLY as you want it to appear in the catalog; include prerequisites, co-requisites, and other restrictions. If changing course description, please include both old and new course descriptions.

OLD:
Builds on the foundation established in 601 and focuses on topics such as: algorithms for query processing and optimization, physical database design, transaction processing, concurrency control, database backup and recovery techniques, database security, distributed databases, multimedia databases, object and object-relational databases, data warehousing, and data mining.

NEW:
Topics such as algorithms for query processing and optimization, physical database design, transaction processing, concurrency control, database backup and recovery techniques, database security, distributed databases, multimedia databases, object and object-relational databases, data warehousing, and data mining.

September 2011
Prerequisite: CSIS 601

IV. RATIONALE / JUSTIFICATION: If course change – please indicate the course change details. If course change or deletion—please provide reasons for change(s) to or deletion of a course. If a new course—briefly address the goals/objectives for the course and the relationship to the strategic plan.

This course is part of a joint program offered through CoC and the Citadel. The purpose of the change is to bring our catalog description into compliance with those of the Citadel.

Also, the catalog is in error, as the prerequisite of 601 is not listed.

V. STUDENT LEARNING OUTCOMES and ASSESSMENT

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Method and Performance Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>What will students know and be able to do when they complete the course?</td>
<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students be able to do on the assessment?</td>
</tr>
<tr>
<td>1. Have mastered the concepts of secondary storage including physical data organization and the concepts of index structure including B-Trees, Hash Tables, Bitmap, and Multidimensional</td>
<td>Students will implement data structures in a simplified database system. Students should score an 80% or better on these assignments.</td>
</tr>
<tr>
<td>2. Be familiar with the query compiler including parse trees, logical query plans and physical query plans.</td>
<td>Students will implement query parser using language recognition tools. Students should score an 80% or better on these assignments.</td>
</tr>
<tr>
<td>3. Understand methods of handling system failure include undo and redo logs</td>
<td>Assessment will involve test and final exam questions on topic. Students should score 80% or better on these questions.</td>
</tr>
<tr>
<td>4. Have mastered the concepts of Concurrency Control including locking and timestamp algorithms and Transaction Management including serializability and deadlocks</td>
<td>Assessment will involve test and final exam questions on topic. Students should score 80% or better on these questions.</td>
</tr>
</tbody>
</table>

How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?

This course supports the program outcome: Students will acquire depth in an area of specialization (computer science, information systems, or software engineering) appropriate for a professional graduate degree and compatible with local needs.
VII. IMPACT ON EXISTING PROGRAMS and COURSES: Please briefly document the impact and expected changes of this new/changed/deleted course on other departments, programs and courses; if deleting a course—list all departments and programs that include the course; if adding/changing a course—explain any overlap with existing courses in the same or different departments; if adding or deleting a course that will be part of a joint program identify the partner institution.

NONE.

VIII. COSTS ASSOCIATED WITH THE ACTION REQUESTED: List all of the new costs or cost savings, (including new faculty/staff requests, library or equipment, etc.) associated with the action requested. New courses requiring additional resources will need special justification.

NONE.
IX. APPROVAL AND SIGNATURES

Signature of Program Director:

Date: October 1, 2012

Signature of Department Chair:

Date: 10-3-12

Signature of Additional Chair*:

Date:

Signature of Schools’ Dean:

Date: 10/10/12

Signature of Additional Schools’ Dean*:

Date:

Signature of the Provost:

Date: 10/20/12

Signature of Budget Director/Business Affairs Office:

Date: 10.23.12

*For interdisciplinary courses

Return form to the Graduate School Office for Further Processing

Signature of Chair of the Faculty Committee on Graduate Education, Continuing Education & Special Programs:

Date: 11/9/2012

Signature of Chair of the Graduate Council:

Date: 11/2/12

Signature of Faculty Senate Secretary:

Date:

Date Approved by Faculty Senate:

September 2011
Contact Name: Renee McCauley  Email: mccauleyr@cofc.edu  Phone: 953-3187

Department Name: Computer Science  Graduate Program name: Computing and Information Sciences

Course Prefix, Number, and Title: CSIS  657 Embedded Systems Design

I. CATEGORY OF REVIEW (Check all that apply)

NEW COURSE  CHANGE COURSE  DELETE COURSE

☐ New Course (attach syllabus*)  ☐ Change Number (IV, VII, VIII, IX)  ☐ Delete Course (IV, VII, IX)

☐ Change Title (IV, VII, VIII, IX)

☐ Change Credits/Contact hours (II, IV, VII, IX)

☒ Prerequisite Change (IV, VII, VIII, IX)

☐ Edit Description (III, IV, VII, VIII, IX)

☐ Approve for Cross-listing (attach Graduate Permission to Cross-list Form)

Date (Semester/Year) the course will first be offered, course changes or deletion will go into effect: Fall 2013

NEW COURSE:

*ATTACH THE SYLLABUS FOR A NEW GRADUATE COURSE to include:

- Course description and objectives
- Method of teaching (e.g., lecture, seminar, on-line, hybrid)
- Required and optional texts and materials
- Graduate School Grading Scale
- Assignments, student learning outcomes and assessment components
- Policies to include attendance, Honor Code, American Disabilities Act statement
- Tentative course schedule with specific topics
List prerequisites and / or other restrictions below

Prerequisites: CSIS 602 and CSIS 604.

Will this course be added to the Degree Requirements?

a) ☐ Yes  ☒ No

b) If yes, explain

No – this course remains an elective.

II. NUMBER OF CREDITS and CONTACT HOURS per week

<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Lab</th>
<th>Seminar</th>
<th>Ind. Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Contact Hours</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Credit Hours</td>
<td>3</td>
</tr>
</tbody>
</table>

Is this course repeatable? ☐ yes  ☒ no  If so, how many credit hours may the student earn in this course?

III. CATALOG DESCRIPTION Limit to 50 words EXACTLY as you want it to appear in the catalog; include prerequisites, co-requisites, and other restrictions. If changing course description, please include both old and new course descriptions.

OLD prerequisites:
Prerequisites: CSIS 602 and CSIS 604, or program director approval.

NEW prerequisites:
Prerequisites: CSIS 602 and CSIS 604.
IV. RATIONALE / JUSTIFICATION: If course change – please indicate the course change details. If course change or deletion—please provide reasons for change(s) to or deletion of a course. If a new course—briefly address the goals/objectives for the course and the relationship to the strategic plan.

This course is part of a joint program offered through CoC and the Citadel. The purpose of the change is to bring our catalog description and prerequisites into compliance with those of the Citadel.

V. STUDENT LEARNING OUTCOMES and ASSESSMENT

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Method and Performance Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>What will students know and be able to do when they complete the course?</td>
<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students be able to do on the assessment?</td>
</tr>
<tr>
<td>1. Use real-time embedded systems concepts such as hardware architectures, RTOSes, tools and toolchains, techniques and habits that differ from desktop programming in formulating solutions to problems.</td>
<td>Assessment will involve test and final exam questions on topic. Students should score 80% or better on these questions.</td>
</tr>
<tr>
<td>2. Write well-designed, medium-complexity programs in a modern high-level programming language that run on the embedded processor and produce an observable result.</td>
<td>Students will write code that solves or performs specific tasks. Source code meets an accepted coding standard. Students should score an 80% or better on these assignments.</td>
</tr>
<tr>
<td>3. Write and compile code on one platform and then download and execute it on the target platform.</td>
<td>Students will download code to the target processor and execute it. Students should score an 80% or better on these assignments.</td>
</tr>
</tbody>
</table>

How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?

This course supports the program outcome: Students will acquire depth in an area of specialization (computer science, information systems, or software engineering) appropriate for a professional graduate degree and compatible with local needs.

The skill is introduced in this course.
VII. IMPACT ON EXISTING PROGRAMS and COURSES: Please briefly document the impact and expected changes of this new/changed/deleted course on other departments, programs and courses; if *deleting a course*—list all departments and programs that include the course; if *adding/changing a course*—explain any overlap with existing courses in the same or different departments; if *adding or deleting* a course that will be part of a joint program identify the partner institution.

None.

VIII. COSTS ASSOCIATED WITH THE ACTION REQUESTED: List all of the new costs or cost savings, (including new faculty/staff requests, library or equipment, etc.) associated with the action requested. New courses requiring additional resources will need special justification.

None.
IX. APPROVAL AND SIGNATURES

Signature of Program Director:  

_________________________ Date: August 12, 2012

Signature of Department Chair:  

_________________________ Date: 9/10/12

Signature of Additional Chair*:  

_________________________ Date: 

Signature of Schools’ Dean:  

_________________________ Date: 10/10/12

Signature of Additional Schools’ Dean*:  

_________________________ Date: 

Signature of the Provost:  

_________________________ Date: 10/28/12

Signature of Budget Director/Business Affairs Office:  

_________________________ Date: 10/23/12

*For interdisciplinary courses

Return form to the Graduate School Office for Further Processing

Signature of Chair of the Faculty Committee on Graduate Education, Continuing Education & Special Programs:  

_________________________ Date: 11/9/2012

Signature of Chair of the Graduate Council:  

_________________________ Date: 1/12/12

Signature of Faculty Senate Secretary:  

_________________________ Date: 

Date Approved by Faculty Senate:  

September 2011
FACULTY COMMITTEE ON GRADUATE EDUCATION, CONTINUING EDUCATION
AND SPECIAL PROGRAMS

GRADUATE COURSE PROPOSAL FORM

Contact Name: Renee McCauley  Email: mccauleyr@cofc.edu  Phone: 953-3187

Department Name: Computer Science  Graduate Program name: Computing and Information Sciences

Course Prefix, Number, and Title: CSIS 674 Introduction to Computer Graphics

I. CATEGORY OF REVIEW (Check all that apply)

NEW COURSE

☐ New Course (attach syllabus*)

CHANGE COURSE

☐ Change Number (IV, VII, VIII, IX)  ☐ Delete Course (IV, VII, IX)
☐ Change Title (IV, VII, VIII, IX)
☐ Change Credits/Contact hours (II, IV, VII, IX)
☐ Prerequisite Change (IV, VII, VIII, IX)
☐ Edit Description (III, IV, VII, VIII, IX)

☐ Approve for Cross-listing (attach Graduate Permission to Cross-list Form)

Date (Semester/Year) the course will first be offered, course changes or deletion will go into effect: Fall 2013

NEW COURSE:

*ATTACH THE SYLLABUS FOR A NEW GRADUATE COURSE to include:

- Course description and objectives
- Method of teaching (e.g., lecture, seminar, on-line, hybrid)
- Required and optional texts and materials
- Graduate School Grading Scale
- Assignments, student learning outcomes and assessment components
- Policies to include attendance, Honor Code, American Disabilities Act statement
- Tentative course schedule with specific topics
List prerequisites and/or other restrictions below

None.

Will this course be added to the Degree Requirements?

a) ☐ Yes ☒ No

b) If yes, explain

II. NUMBER OF CREDITS and CONTACT HOURS per week

<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Lab</th>
<th>Seminar</th>
<th>Ind. Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Contact Hours</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B. Credit Hours

3

Is this course repeatable? ☐ yes ☒ no If so, how many credit hours may the student earn in this course?

III. CATALOG DESCRIPTION Limit to 50 words EXACTLY as you want it to appear in the catalog: include prerequisites, co-requisites, and other restrictions. If changing course description, please include both old and new course descriptions.

OLD:
This course is an introduction to the fundamental principles of computer graphics. Using the OpenGL application programming interface, students will learn these principles by writing a series of programming projects. The programming projects will be written in C++; students who have programmed in C or Java should have little difficulty with the transition to the language.

NEW:
An introduction to the fundamental principles of computer graphics. Using standard graphics libraries, students will learn these principles by writing a series of programming projects.
IV. RATIONALE / JUSTIFICATION: If course change – please indicate the course change details. If course change or deletion—please provide reasons for change(s) to or deletion of a course. If a new course—briefly address the goals/objectives for the course and the relationship to the strategic plan.

This course is part of a joint program offered through CofC and the Citadel. The purpose of the change is to bring our catalog description and prerequisites into compliance with those of the Citadel.

V. STUDENT LEARNING OUTCOMES and ASSESSMENT

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Method and Performance Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>What will students know and be able to do when they complete the course?</td>
<td>For item 1-4 students will be assessed in two ways:</td>
</tr>
<tr>
<td>1. To be able to model and transform 3D mesh objects</td>
<td>1) One or more computer programs will be written to accomplish the task identified in the outcome</td>
</tr>
<tr>
<td>2. To be able to properly view and realistically render 3D scenes using illumination models,</td>
<td>2) Multiple quizzes and/or one or two written exams will be administered to evaluate the students' grasp of</td>
</tr>
<tr>
<td>hidden surface removal, texture/bump mapping, and shadows</td>
<td>the concepts</td>
</tr>
<tr>
<td>3. To understand aliasing and two more more ways for mitigating aliasing</td>
<td>Students should average an 80% or better on the assessments.</td>
</tr>
<tr>
<td>4. To program a simple ray tracer</td>
<td>A research project or significant programming project will be assigned culminating in a written or oral</td>
</tr>
<tr>
<td>5. To understand one or more additional advanced topics such as:</td>
<td>report of the findings/results. The instructor will assess the presentation. A score of 80% or better</td>
</tr>
<tr>
<td>Spline curves</td>
<td>is expected.</td>
</tr>
<tr>
<td>Shaders (Pixel or Vertex)</td>
<td>How does this course align with the student learning outcomes articulated for the major, program, or</td>
</tr>
<tr>
<td>Pixmaps</td>
<td>general education? What program-level outcome or outcomes does it support? Is the content or skill</td>
</tr>
<tr>
<td>Human perception of color</td>
<td>introduced, reinforced, or demonstrated in this course?</td>
</tr>
<tr>
<td>Interactive computer graphics</td>
<td>This course contributes to the program as a specialization-elective in the CS specialization. It</td>
</tr>
<tr>
<td>Animation</td>
<td>contributes to depth in the area of computer science.</td>
</tr>
</tbody>
</table>

September 2011
VII. IMPACT ON EXISTING PROGRAMS and COURSES: Please briefly document the impact and expected changes of this new/changed/deleted course on other departments, programs and courses; if deleting a course—list all departments and programs that include the course; if adding/changing a course—explain any overlap with existing courses in the same or different departments; if adding or deleting a course that will be part of a joint program identify the partner institution.

NONE.

VIII. COSTS ASSOCIATED WITH THE ACTION REQUESTED: List all of the new costs or cost savings, (including new faculty/staff requests, library or equipment, etc.) associated with the action requested. New courses requiring additional resources will need special justification.

NONE.
IX. APPROVAL AND SIGNATURES

Signature of Program Director:

_____________________________ Date: October 1, 2012

Signature of Department Chair:

_____________________________ Date: 10-3-12

Signature of Additional Chair*:

_____________________________ Date: __________

Signature of Schools’ Dean:

_____________________________ Date: 10/10/12

Signature of Additional Schools’ Dean*:

_____________________________ Date: __________

Signature of the Provost:

_____________________________ Date: 10/28/12

Signature of Budget Director/Business Affairs Office:

_____________________________ Date: 10-23-12

*For interdisciplinary courses

Return form to the Graduate School Office for Further Processing

Signature of Chair of the Faculty Committee on Graduate Education, Continuing Education & Special Programs:

_____________________________ Date: 11/3/2012

Signature of Chair of the Graduate Council:

_____________________________ Date: 11/12/12

Signature of Faculty Senate Secretary:

_____________________________ Date: __________

Date Approved by Faculty Senate: ____________________