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| For Academic Affairs and Research Use Only | |
| CIP Code: |  |
| Degree Code: |  |

**New Course Proposal Form**

**[ ] Undergraduate Curriculum Council**

**[X] Graduate Council**

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| **[X] New Course or [ ]Experimental Course (1-time offering) (Check one box)** |

Signed paper copies of proposals submitted for consideration are no longer required. Please type approver name and enter date of approval.

Email completed proposals to [curriculum@astate.edu](mailto:curriculum@astate.edu) for inclusion in curriculum committee agenda.

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| Edward Hammerand 7/24/2017 **Department Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **COPE Chair (if applicable)** |
| Hung-Chi Su 7/24/2017 **Department Chair:** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Head of Unit (If applicable)** |
| David F. Gilmore 10/6/2017 **College Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Undergraduate Curriculum Council Chair** |
| Anne A. Grippo 10/6/2017 **College Dean** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Graduate Curriculum Committee Chair** |
| |  |  | | --- | --- | | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Enter date |   **General Education Committee Chair (If applicable)** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Vice Chancellor for Academic Affairs** |

1. Contact Person (Name, Email Address, Phone Number)

Hung-Chi Su, suh@astate.edu, (870)680-8119

2. Proposed Starting Term and Bulletin Year

Spring, 2018

3. Proposed Course Prefix and Number (Confirm that number chosen has not been used before. For variable credit courses, indicate variable range. *Proposed number for experimental course is 9*. )

CS 5613

4. Course Title – if title is more than 30 characters (including spaces), provide short title to be used on transcripts. Title cannot have any symbols (e.g. slash, colon, semi-colon, apostrophe, dash, and parenthesis). Please indicate if this course will have variable titles (e.g. independent study, thesis, special topics).

Mobile Application Development

5. Brief course description (40 words or fewer) as it should appear in the bulletin.

Creation of mobile applications for iOS and Android devices through a project-based environment, deployment of applications to mobile hardware and how to effectively work in a team environment for application development.

6. Prerequisites and major restrictions. (Indicate all prerequisites. If this course is restricted to a specific major, which major. If a student does not have the prerequisites or does not have the appropriate major, the student will not be allowed to register).

1. **Yes** Are there any prerequisites?
   1. If yes, which ones?

CS3113 or “B” or better in CS5032

* 1. Why or why not?

The material covered by the course requires significant experience in computer programming and an understanding of advanced programming concepts.

1. **No** Is this course restricted to a specific major?
   1. If yes, which major? Enter text...

7. Course frequency(e.g. Fall, Spring, Summer). *Not applicable to Graduate courses.*

not applicable

8. Will this course be lecture only, lab only, lecture and lab, activity, dissertation, experiential learning, independent study, internship, performance, practicum, recitation, seminar, special problems, special topics, studio, student exchange, occupational learning credit, or course for fee purpose only (e.g. an exam)? Please choose one.

Lecture only

9. What is the grade type (i.e. standard letter, credit/no credit, pass/fail, no grade, developmental, or other [please elaborate])

Standard letter

10. **Yes** Is this course dual listed (undergraduate/graduate)?

11. **No** Is this course cross listed?

*(If it is, all course entries must be identical including course descriptions. Submit appropriate documentation for requested changes. It is important to check the course description of an existing course when adding a new cross listed course.)*

**11.1** – If yes, please list the prefix and course number of cross listed course.

Enter text...

**11.2** – **Yes / No** Are these courses offered for equivalent credit?

Please explain. Enter text...

12. **No** Is this course in support of a new program?

a. If yes, what program?

Enter text...

13. **No** Does this course replace a course being deleted?

a. If yes, what course?

Enter text...

14. **No** Will this course be equivalent to a deleted course?

a. If yes, which course?

Enter text...

15. **Yes** Has it been confirmed that this course number is available for use?

*If no: Contact Registrar’s Office for assistance.*

16. **No** Does this course affect another program?

If yes, provide confirmation of acceptance/approval of changes from the Dean, Department Head, and/or Program Director whose area this affects.

Enter text...

**Course Details**

17. Outline (The course outline should be topical by weeks and should be sufficient in detail to allow for judgment of the content of the course.)

Week 1 Introduction to Mobile technologies and programming environments

Week 2 Programming languages and tools

Week 3 Mobile Application Design

Week 4 Model-View-Controller and User Interfaces

Week 5 Building Controls

Week 6 Building Controls

Week 7 Team Project Software Life Cycle

Week 8 Mobile Media

Week 9 Mobile Communication

Week 10 Other Mobile Technologies

Week 11 Mobile Application Deployment

Week 12 Testing and Debugging Mobile Apps

Week 13 Portability Issues

Week 14 Project Presentations

18. Special features (e.g. labs, exhibits, site visitations, etc.)

None

19. Department staffing and classroom/lab resources

1. Will this require additional faculty, supplies, etc.?

No. The course has been in the rotation for several semesters as a special topics subject. Its addition to the bulletin as a regular course will have no impact on department staffing or resources.

20. **No** Does this course require course fees?

*If yes: please attach the New Program Tuition and Fees form, which is available from the UCC website.*

**Course Justification**

21. Justification for course being included in program. Must include:

a. Academic rationale and goals for the course (skills or level of knowledge students can be expected to attain)

Mobile application programming has seen a tremendous amount of growth as a result of the ever-increasing use of mobile devices. The course serves to prepare students majoring in Computer Science to be professional application developers on mobile platforms.

Goals Include:

* ability to understand and describe the architecture of a mobile application.
* ability to understand, describe and use the MVC interface architecture.
* ability to understand and use event programming for mobile applications.
* ability to understand and construct a user interface for a mobile application.
* ability to understand and construct the controls for a mobile application.
* ability to understand and integrate a database within a mobile application.
* ability to understand and integrate communications within a mobile application.

b. How does the course fit with the mission established by the department for the curriculum? If course is mandated by an accrediting or certifying agency, include the directive.

One part of the mission is to maintain the curriculum with updated technologies. The state of the art in the software industry has seen rapid growth in mobile application programming in recent years; computer science students need to be prepared for this new development paradigm and current in state-of-the-art technologies. This will give students better insights into the current state of industry than traditional native-platform focused programming courses alone.

c. Student population served.

Graduate.

d. Rationale for the level of the course (lower, upper, or graduate).

The graduate level of the course corresponds to the requirement that students already be well-versed in the fundamentals of programming, and ready to learn about applications of that knowledge in a modern environment.

This course differs from the undergraduate level of the course in the following ways;

* graduate students will serve as team leaders in programming projects
* graduate students will play the roles of clients with which undergraduate students will have to interact
* graduate students will design problem scenarios with which to attempt to “break” applications in order to generate “weekend/holiday/middle-of-the-night” application failures

**Assessment**

**University Outcomes**

22. Please indicate the university-level student learning outcomes for which this new course will contribute. Check all that apply.

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| * 1. **[ ]** Global Awareness | * 1. **[X ]** Thinking Critically | * 1. **[X ]** Information Literacy |

**Relationship with Current Program-Level Assessment Process**

23. What is/are the intended program-level learning outcome/s for students enrolled in this course? Where will this course fit into an already existing program assessment process?

1. M.S. Computer Science graduate students should have a deeper understanding of the theory and application of algorithms, programming languages, and computer processes.
2. M.S. Computer Science graduate students should have the ability to apply advanced analysis techniques to problem identification and solution in computing applications.
3. M.S. Computer Science graduate students should have the ability to apply advanced implementation techniques to problem identification and solution in computing applications.

The course will be assessed along with other graduate courses on the same schedule.

24. Considering the indicated program-level learning outcome/s (from question #23), please fill out the following table to show how and where this course fits into the program’s continuous improvement assessment process.

*For further assistance, please see the ‘Expanded Instructions’ document available on the UCC - Forms website for guidance, or contact the Office of Assessment at 870-972-2989.*

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| **Program-Level Outcome 1 (from question #23)** | M.S. Computer Science graduate students should have a deeper understanding of the theory and application of algorithms, programming languages, and computer processes |
| Assessment Measure | Comprehensive examinations and employer surveys |
| Assessment  Timetable | Comprehensive exams will be conducted each semester, reviewed annually, and reported on every three years; employer surveys will be conducted each fall and reported on every four years. |
| Who is responsible for assessing and reporting on the results? | Department assessment committee. |

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| **Program-Level Outcome 2 (from question #23)** | M.S. Computer Science graduate students should have the ability to apply advanced analysis techniques to problem identification and solution in computing applications. |
| Assessment Measure | Comprehensive examinations and employer surveys |
| Assessment  Timetable | Comprehensive exams will be conducted each semester, reviewed annually, and reported on every three years; employer surveys will be conducted each fall and reported on every four years. |
| Who is responsible for assessing and reporting on the results? | Department assessment committee. |

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| **Program-Level Outcome 3 (from question #23)** | M.S. Computer Science graduate students should have the ability to apply advanced implementation techniques to problem identification and solution in computing applications. |
| Assessment Measure | Comprehensive examinations and employer surveys |
| Assessment  Timetable | Comprehensive exams will be conducted each semester, reviewed annually, and reported on every three years; employer surveys will be conducted each fall and reported on every four years. |
| Who is responsible for assessing and reporting on the results? | Department assessment committee. |

*(Repeat if this new course will support additional program-level outcomes)*

**Course-Level Outcomes**

25. What are the course-level outcomes for students enrolled in this course and the associated assessment measures?

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| **Outcome 1** | Students will be able to understand and describe the architecture of a mobile application and the MVC interface as well as event programming. |
| Which learning activities are responsible for this outcome? | The construction and presentation of a mobile program for the course project will be used to assess the student’s understanding of the architecture and ability to describe the processes and procedures in the application construction. Both the MVC interface and event programming are essential parts of the course project. |
| Assessment Measure | A rubric is used to assess the student outcome and a 75% has been designated as a passing score for this outcome. |

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| **Outcome 2** | Students will be able to understand and construct a user interface and controls for a mobile application. |
| Which learning activities are responsible for this outcome? | The project will be used in the assessment of the outcome. Both a user interface and controls are essential parts of the course project. |
| Assessment Measure | A rubric is used to assess the student outcome as part of the presentation and construction of the project and a 75% has been designated as a passing score for this outcome. |

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| **Outcome 3** | Students will be able to understand and integrate a database and communications within a mobile application. |
| Which learning activities are responsible for this outcome? | The project will be used in the assessment of the outcome. Both a database and communications are essential parts of the course project. |
| Assessment Measure | A rubric is used to assess the student outcome as part of the construction of the project and a 75% has been designated as a passing score for this outcome. |

*(Repeat if needed for additional outcomes)*

**Bulletin Changes**

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| **Instructions** |
| **Please visit** [**http://www.astate.edu/a/registrar/students/bulletins/index.dot**](http://www.astate.edu/a/registrar/students/bulletins/index.dot) **and select the most recent version of the bulletin. Copy and paste all bulletin pages this proposal affects below. Follow the following guidelines for indicating necessary changes.**  **\*Please note: Courses are often listed in multiple sections of the bulletin. To ensure that all affected sections have been located, please search the bulletin (ctrl+F) for the appropriate courses before submission of this form.**  - Deleted courses/credit hours should be marked with a red strike-through (~~red strikethrough~~)  - New credit hours and text changes should be listed in blue using enlarged font (blue using enlarged font).  - Any new courses should be listed in blue bold italics using enlarged font (***blue bold italics using enlarged font***)  *You can easily apply any of these changes by selecting the example text in the instructions above, double-clicking the ‘format painter’ icon 🡪 , and selecting the text you would like to apply the change to.*  *Please visit* [*https://youtu.be/yjdL2n4lZm4*](https://youtu.be/yjdL2n4lZm4) *for more detailed instructions.* |

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**CS 5423. Computer Graphics II** Continuation of Computer Graphics I. Techniques for generation of realistic solid models are examined. Topics include hidden surface removal, shading, shadowing, reflection, refraction, and color theory. Prerequisite: CS 5413.

**CS 5433. Artificial Intelligence** Representation of knowledge and introduction to a functional programming language; search methods and control. Typical applications of artificial intelligence. Prerequisite: CS 3113 or “B” or better in CS 5032.

**CS 5543. Database Systems** Topics include major database models; relational algebra; data independence and database normalization; entity relationship model; security, integrity, recovery and concurrency issues; physical organization of a database. Prerequisite: CS 3113 or “B” or better in CS 5032.

***CS 5613. Mobile Application Development Creation of mobile applications for iOS and Android devices through a project-based environment, deployment of applications to mobile hardware and how to effectively work in a team environment for application development. Prerequisite: CS 3113 or "B" or better in CS 5032 or consent of instructor.***

**CS 5713. Analysis of Algorithms** The analysis of space and time requirements of algorithms. Worst-case and average case studies. Greedy algorithms and divide-and-conquer algorithms examined. Tractable and intractable algorithms surveyed. Prerequisites: CS 3113 or “B” or better in CS 5032, and MATH 2214.

**CS 5723. Automata Theory** Study formal languages and equivalent models of computation. Finite state automata and regular expressions. Push-down automata and context free grammars. Pumping lemmas and closure properties. Turing Machines. Prerequisite: CS 3113 or “B” or better in CS 5032.

**CS 5823. Scripting Languages** Examination of scripting languages compared to conventional programming languages and construction of domain-specific solutions for common problems in GUI, networking, and web programming. Prerequisite: CS 3113 or “B” or better in CS 5032.