Computer Science Department
Graduate Program
(Comprehensive Examination Assessment)
Approved Feb. 2006

Student learning goals and objectives:
  Goal 1: Students will acquire a broad knowledge of theoretical and applied topics in computer science and develop communication skills.

  Objective 1.1: Students will demonstrate a mastery of material presented in two courses covering theoretical topics and two courses covering practical topics.

Educational experiences:
  Four of the eight core courses, which include:
  • CSci 522 Theoretical Foundations
  • CSci 532 Programming Languages and Paradigms
  • CSci 575 Analysis of Algorithms
  • CSci 565 Advanced Software Engineering
  • CSci 513 Advanced Database Systems
  • CSci 543 Advanced Artificial Intelligence
  • CSci 551 Distributed Operating Systems
  • CSci 555 Computer Networks
  Comprehensive examination covering the four core courses selected by the student.

Assessment methods:
  1. Comprehensive examination scores and number of repeated attempts.
  2. A checklist will be provided to each faculty member involved in the current comprehensive examination that will require the faculty member to rate the performance of each student taking the comprehensive examination using the following criteria:
     • Foundation: Has the student demonstrated mastery of the topical foundation material?
     • Theory: Has the student demonstrated an understanding of the topical theoretical material?
     • Problem solving: Has the student demonstrated the ability to solve new problems in the topic?
     • Current trends: Has the student demonstrated knowledge of current trends in the topical area?
     • Clarity of answers: Did the student answer the comprehensive examination questions in a clear and concise manner?

Timeline:
  Data will be collected as each course and core exam is offered and analyzed once a year.

Responsibilities:
  Faculty writing and grading the core exams.
  The data will be compiled and analyzed by the graduate director

Use of results and process for documentation and decision-making:
Results will be presented at department graduate committee meetings where decisions on curricular or program changes are discussed and approved for presentation at department faculty meetings.

Summaries of assessment activities will be included in the department’s annual report.

Department files with all data and documentation will be maintained by the department and available for reference.
Comprehensive Examination Assessment Checklist

Please rate the comprehensive examination using the following criteria by circling the most appropriate answer:

- **Foundation:** At what level has the student demonstrated a mastery of the topical foundation material?
  
<table>
<thead>
<tr>
<th>Unacceptably</th>
<th>Unsatisfactorily</th>
<th>No Opinion</th>
<th>Satisfactorily</th>
<th>Excellent</th>
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</thead>
</table>

- **Theory:** At what level has the student demonstrated an understanding of the topical theoretical material?

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<thead>
<tr>
<th>Unacceptably</th>
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- **Problem solving:** At what level has the student demonstrated the ability to solve new problems in the topic?

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- **Current trends:** At what level has the student demonstrated knowledge of current trends in the topical area?

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- **Clarity of answers:** To what extent did the student answer the comprehensive examination questions in a clear and concise manner?

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Student learning goals and objectives:
Goal 1: Students will acquire a broad knowledge of theoretical and applied topics in computer science and develop communication skills.

Objective 1.2: Students will be able to organize and present information orally, visually, and in writing.

Educational experiences:
Development / presentation of their defense or software engineering project review.

Assessment Methods:
A checklist will be provided to each committee member (or software engineering project ad hoc committee member) prior to each defense that will require the committee to rate the defense using the following criteria:
- Organization: Does the presentation have a logical flow?
- Clarity: Are the slides self-explanatory, and does the student discuss the material in a clear and precise manor?
- Authorship: Has the student convinced the committee that they are the author/researcher/developer of the research and presentation?
- Expertise: Has the student convinced the committee that they are now an expert in this domain? Do they know and have they presented the pros and cons of their method?
- Demonstration: If applicable, did the student provide a demonstration of their work, or did they provide theoretical proofs, if applicable?
- Publications: Has the student published their results?

Timeline:
Data will be collected as each student prepares to graduate and analyzed once a year.

Responsibilities:
Student’s faculty advisor and thesis committee members or software engineering project ad hoc committee members.
The data will be compiled and analyzed by the graduate director.

Use of results and process for documentation and decision-making:
Results will be presented at department graduate committee meetings where decisions on curricular or program changes are discussed and approved for presentation at department faculty meetings.

Summaries of assessment activities will be included in the department’s annual report.

Department files with all data and documentation will be maintained by the department and available for reference.
Defense Assessment Checklist

Please rate the defense using the following criteria by circling the most appropriate answer:

- **Organization:** To what level does the presentation have a logical flow?
  - Unacceptably
  - Unsatisfactorily
  - No Opinion
  - Satisfactorily
  - Excellently

- **Clarity:** Are the slides self-explanatory, and does the student discuss the material in a clear and precise manner?
  - Unacceptably
  - Unsatisfactorily
  - No Opinion
  - Satisfactorily
  - Excellently

- **Authorship:** To what extent has the student convinced the committee that they are the author/researcher/developer of the research and presentation?
  - Unacceptably
  - Unsatisfactorily
  - No Opinion
  - Satisfactorily
  - Excellently

- **Expertise:** To what extent has the student convinced the committee that they are now an expert in this domain (Do they know and have they presented the pros and cons of their method?)?
  - Unacceptably
  - Unsatisfactorily
  - No Opinion
  - Satisfactorily
  - Excellently

- **Demonstration:** If applicable, did the student provide a demonstration of their work, or did they provide theoretical proofs, if applicable?
  - Unacceptably
  - Unsatisfactorily
  - No Opinion
  - Satisfactorily
  - Excellently

- **Publications:** To what level has the student published their results?
  - Unacceptably
  - Unsatisfactorily
  - No Opinion
  - Satisfactorily
  - Excellently
Student learning goals and objectives:

Goal 2: Thesis track students will develop creative thinking, problem solving and research skills, and acquire expertise in a specific computer science domain.

Objective 2.1: Students will be able to investigate and thus master a domain of research in computer science. Students will also demonstrate creative thinking and problem solving skills towards the development of an original contribution towards that domain.

Educational experiences:

CSci 998 Conducting independent research and writing of the thesis.

Assessment methods:

A checklist will be provided to each committee member that will require the committee to rate the thesis using the following criteria:

- Organization: Does the thesis have a logical flow?
- Clarity: Is the writing and grammar clear, precise and proper?
- Literature review and use of references: Are there sufficient up to date references, and are the references used properly? Are quotes given proper credit, and offset or enclosed by quotes?
- Justification of work: Does the literature review support the idea that this work is based on current techniques and addresses a need?
- Contribution to state of the art: Did the student successfully contribute to the state of the art?
- Experiment and results: Are the experiments and results (or theoretical development or persuasive methods, benchmarks, etc) sufficient, and does the student understand what they have?
- Conclusion: Does the conclusion discuss their results, what they learned, and what is left to be done?

Timeline:

Data will be collected as each student prepares to graduate and analyzed once a year.

Responsibilities:

Student’s faculty advisory committee members.
The data will be compiled and analyzed by the graduate director.

Use of results and process for documentation and decision-making:

Results will be presented at department graduate committee meetings where decisions on curricular or program changes are discussed and approved for presentation at department faculty meetings.

Summaries of assessment activities will be included in the department’s annual report.
Department files with all data and documentation will be maintained by the department and available for reference.
Thesis Assessment Checklist

Please rate the thesis using the following criteria by circling the most appropriate answer:

- Organization: Does the thesis have a logical flow?
  
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- Clarity: Is the writing and grammar clear, precise and proper.
  
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- Literature review and use of references: Are there sufficient up to date references, and are the references used properly? Are quotes given proper credit, and offset or enclosed by quotes?
  
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- Justification of work: Does the literature review support the idea that this work is based on current techniques and addresses a need?
  
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- Contribution to state of the art: To what level did the student successfully contribute to the state of the art?
  
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- Experiment and results: Are the experiments and results (or theoretical development or Persuasive methods, benchmarks, etc) sufficient, and does the student understand what they have?
  
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- Conclusion: Does the conclusion discuss their results, what they learned and what is left to be done?
  
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Student learning goals and objectives:

Goal 3: Applied Software Engineering track students will develop problem solving skills and acquire software engineering skills.

Objective 3.1 Students will be able to acquire and document systems requirements of diverse and customer driven software projects. The essence of this objective is to write down, and to keep current the presentation and results of design decisions together with the rational behind their design decisions in an accessible and meaningful form.

Educational experiences:

CSci 566 Software Engineering Project
CSci 997 Independent study

Assessment methods:

A checklist will be provided to the advisor (and ad hoc committee members) that will require them to rate the software engineering document using the following criteria:

- Organization: Does the document have a logical flow?
- Clarity: Is the writing and grammar clear, precise and proper?
- Relevance of work: Is the work relevant? Did the student use sound theory or methodology to develop software with relative complexity that will be of any use to anyone? Did the student find a “real” customer? Does the project have some scientific merit?
- Completeness of specification: Did the student use an appropriate process to document all the requirements and specifications?
- Completeness of design: Did the student develop a software design that implemented the entire requirement specified in the requirements specification?
- Completeness of implementation: Did the student implement software that corresponds to the detailed design?
- Completeness of testing plan: Did the student test or verify all the specified requirements outlined in design and specification documents?
- Conclusion: Does the conclusion discuss their resulting software and design tradeoffs that were required?
- Future work: Is there any discussion about future work?
- User’s Manual: Does the document include a well written user’s manual?

Timeline:

Data will be collected as each student prepares to graduate and analyzed once a year.

Responsibilities:

Student’s advisor and ad hoc committee members.
The data will be compiled and analyzed by the graduate director.

Use of results and process for documentation and decision-making:
Results will be presented at department graduate committee meetings where decisions on curricular or program changes are discussed and approved for presentation at department faculty meetings.

Summaries of assessment activities will be included in the department’s annual report.

Department files with all data and documentation will be maintained by the department and available for reference.
Software Engineering Document Assessment Checklist

Please rate the thesis using the following criteria by circling the most appropriate answer:

- **Organization**: Does the document have a logical flow?
  
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- **Clarity**: Is the writing and grammar clear, precise and proper.
  
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- **Relevance of work**: Is the work relevant? Did the student use sound theory or methodology to develop software with relative complexity that will be of any use to anyone? Did the student find a “real” customer? Does the project have some scientific merit?
  
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- **Completeness of specification**: Did the student use an appropriate process to document all the requirements and specifications?
  
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- **Completeness of design**: Did the student develop a software design that implemented the entire requirement specified in the requirements specification?
  
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- **Completeness of implementation**: Did the student implement software that corresponds to the detailed design?
  
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- **Completeness of testing plan**: Did the student test or verify all the specified requirements outlined in design and specification documents?
  
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- **Conclusion**: Does the conclusion discuss their resulting software and design tradeoffs that were required?
  
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- **Future work**: Is there any discussion about future work.
  
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- **User’s Manual**: Does the document include a well written user’s manual?
  
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Student learning goals and objectives:
Goal 3: Applied Software Engineering track students will develop problem solving skills and acquire software engineering skills.

Objective 3.2: Students will demonstrate problem solving skills and the ability to develop software using established software engineering methods and tools.

Educational experiences:
Two of the three software engineering courses, which include:
- CSci 463 Software Engineering
- CSci 565 Advanced Software Engineering
- CSci 562 Formal Specification Methods
- CSci 566 Software Engineering Project

Assessment methods:
A checklist will be provided to the advisor (and ad hoc committee members) that will require them to rate the software using the following criteria:
- Originality of design: How original is the software design?
- Verification of design: How well does the software conform to the requirements and specifications?
- Validation of design: How well does the software perform?
- Completeness of implementation: Did the student develop a complete and executable software package?
- Customer satisfaction: How satisfied is the customer with the software?

Timeline:
Data will be collected as each course is offered and analyzed once a year.

Responsibilities:
Student’s advisor and ad hoc committee members.
The data will be compiled and analyzed by the graduate director.

Use of results and process for documentation and decision-making:
Results will be presented at department graduate committee meetings where decisions on curricular or program changes are discussed and approved for presentation at department faculty meetings.

Summaries of assessment activities will be included in the department’s annual report.

Department files with all data and documentation will be maintained by the department and available for reference.
Software Engineering Software Assessment Checklist

Please rate the thesis using the following criteria by circling the most appropriate answer:

- Originality of design: How original is the software design?
  
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- Verification of design: How well does the software conform to the requirements and specifications?
  
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- Completeness of implementation: Did the student develop a complete and executable software package?
  
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- Customer satisfaction: How satisfied is the customer with the software?
  
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