CPSC 221. Data Structures and Algorithms. (3-2). Credit 4. Specification and implementation of basic abstract data types and their associated algorithms: stacks, queues, lists, sorting and selection, searching, graphs, and hashing; performance tradeoffs of different implementations and asymptotic analysis of running time and memory usage; includes the execution of student programs written in C++. Prerequisite: CPSC 121; corequisite MATH 302.

CPSC 411. Design and Analysis of Algorithms. (3-0). Credit 3. Study of computer algorithms for numeric and non-numeric problems; design paradigms; analysis of time and space requirements of algorithms; correctness of algorithms; NP-completeness and undecidability of problems. Prerequisites: CPSC 221, 315; MATH 302.
Texas A&M University

Departmental Request for a New Course
Undergraduate • Graduate • Professional

Submit original form and 2 copies. Attach a course syllabus to each.

1. This request is submitted by the Department of Computer Science

2. Course prefix, number and complete title CPSC 221, Data Structures and Algorithms

3. Course description (not more than 50 words) Specification and implementation of basic abstract data types and their associated algorithms: stacks, queues, lists, sorting and selection, searching, graphs, and hashing; performance tradeoffs of different implementations and asymptotic analysis of running time and memory usage; includes the execution of student programs written in C++.

4. Prerequisite(s) CPSC 121; corequisite CPSC 222 Cross-listed with

5. Is this a variable credit course? ☐ Yes ☐ No If yes, from _____ to _____.

6. Is this a repeatable course? ☐ Yes ☐ No If yes, this course may be taken _____ times. Will the course be repeated within the same semester/term? ☐ Yes ☐ No

7. Has this course been taught as a 489/689? ☐ Yes ☐ No If yes, how many times? _____ Indicate the number of students enrolled for each academic period it was taught.

8. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history) B.S. in Computer Science
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix Course # Title (exclude punctuation) CPSC 221 Data Structures and Algorithms

   Lect. Lab SCH Subject Matter Content Code Admin. Unit Acad. Year FICE Code 3 2 4

   Do not complete shaded area.

Approval recommended by:

Donald McNeese 10/18/06
Head of Department Date

Chair, College Review Committee 10/18/06
Date

Head of Department (if cross-listed course) Date

Dean of College 10/18/06
Date

Submitted to Coordinating Board by:

Dean of College Date

Director of Academic Support Services Date Effective Date

To have this form reviewed, please send to Linda F. Lacey, Mail Stop 1265 or fax to 847-8737.
OAR/AS-5/04

2 of 8 T
Number and Name of Course: CPSC 221 Data Structures and Algorithms

Hours: Theory 3 Practice 2 Total 5 Credits 4

Prerequisites: CPSC 121, Introduction to Program Design and Concepts

Corequisite: CPSC 222, Discrete Structures for Computing

Curricula requiring this course: [ ] None, it will be elective.

1. BS in Computer Science 3.
2. 
3. 
4. 
5. 
6. 

Description of Course (Concise statement of purpose or design.)

Specification and implementation of basic abstract data types and their associated algorithms: stacks, queues, lists, sorting and selection, searching, graphs, and hashing; performance tradeoffs of different implementations and asymptotic analysis of running time and memory usage; includes the execution of student written programs in C++.


Course Outline by Major Topics and Approximate Time for Each:

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<thead>
<tr>
<th>Linear data structures:</th>
<th>HOURS</th>
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<tbody>
<tr>
<td>Stacks, queues and lists</td>
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</table>

<table>
<thead>
<tr>
<th>Sorting and selection</th>
<th>Th. 9  Pr. 6</th>
</tr>
</thead>
</table>

<table>
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<th>Searching:</th>
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<tbody>
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<td>Trees, heaps, priority queues</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Graphs:</th>
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</thead>
<tbody>
<tr>
<td>Depth-first search, breadth-first search, shortest path algorithms, topological sort</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Hashing</th>
<th>Th. 9  Pr. 6</th>
</tr>
</thead>
</table>

Grading: Midterms = 25 %, Final Exam = 25 %, Assignments = 25 %, Labs = 25 %, Total = 100%

Date: Oct. 5, 2006 Course Supervisor: Nancy Amato

ABET Classification: Science 2 Design 2 Math 2 Other 3

Laboratory Requirements: Yes
Americans with Disabilities Act (ADA) Policy Statement

The following ADA Policy Statement (part of the Policy on Individual Disabling Conditions) was submitted to the University Curriculum Committee by the Department of Student Life. The policy statement was forwarded to the Faculty Senate for information.

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, the legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Cain Hall or call 845-1637.

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Scholastic Dishonesty

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Academic Integrity Statement

"An Aggie does not lie, cheat, or steal or tolerate those who do."

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the Texas A&M University community from the requirements or the processes of the Honor System. For additional information please visit: http://www.tamu.edu/aggiehonor

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Texas A&M University

Departmental Request for a New Course
Undergraduate • Graduate • Professional

Submit original form and 2 copies. Attach a course syllabus to each.

1. This request is submitted by the Department of ____________

2. Course prefix, number and complete title CPSC 411, Design and Analysis of Algorithms

3. Course description (not more than 50 words) Study of computer algorithms for numeric and non-numeric problems; design paradigms; analysis of time and space requirements of algorithms; correctness of algorithms; NP-completeness and undecidability of problems.

4. Prerequisite(s) CPSC 221, CPSC 222, CPSC 315 Cross-listed with ____________

5. Is this a variable credit course? ☐ Yes ☐ No If yes, from ____________ to ____________

6. Is this a repeatable course? ☐ Yes ☐ No If yes, this course may be taken ____________ times. Will the course be repeated within the same semester/term? ☐ Yes ☐ No

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9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix Course # Title (exclude punctuation) CPSC 411 Design Analysis Algorithms

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<thead>
<tr>
<th>Lect.</th>
<th>Lab</th>
<th>SCH</th>
<th>Subject Matter Code</th>
<th>Admin. Unit</th>
<th>Acad. Year</th>
<th>FICE Code</th>
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</tr>
</tbody>
</table>

Do not complete shaded area.

Approval recommended by: ____________________________ 10/10/06

Head of Department

Chair, College Review Committee 10/10/06

Dean of College 10/10/06

Submitted to Coordinating Board by: ____________________________ 10/10/06

Dean of College

Director of Academic Support Services 10/10/06

Effective Date

have this form reviewed, please send to Linda F. lacey, Mail Stop 1265 or fax to 847-8737.

5 of 8 T
Number and Name of Course: CPSC 411, Design and Analysis of Algorithms

Hours: Theory 3 Practice 0 Total 3 Credits 3

Prerequisites: CPSC 221, CPSC 222, CPSC 315

Curricula requiring this course: [ ] None, it will be elective.

1. BS in Computer Science 3. ____________________________ 5. ____________________________
2. ____________________________ 4. ____________________________ 6. ____________________________

Description of Course (Concise statement of purpose or design.)
Study of computer algorithms for numeric and non-numeric problems; design paradigms; analysis of time and space requirements of algorithms; correctness of algorithms; NP-completeness and undecidability of problems.


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<table>
<thead>
<tr>
<th>Topic</th>
<th>HOURS</th>
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</thead>
<tbody>
<tr>
<td>Sorting lower bound</td>
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<tr>
<td>Divide and conquer algorithms</td>
<td>3</td>
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<tr>
<td>Greedy algorithms</td>
<td>3</td>
</tr>
<tr>
<td>Dynamic programming</td>
<td>6</td>
</tr>
<tr>
<td>Amortized analysis</td>
<td>3</td>
</tr>
<tr>
<td>Advanced graph algorithms</td>
<td>6</td>
</tr>
<tr>
<td>Randomized algorithms</td>
<td>6</td>
</tr>
<tr>
<td>NP-completeness</td>
<td>6</td>
</tr>
<tr>
<td>Undecidability</td>
<td>6</td>
</tr>
</tbody>
</table>

Grading: Midterms = 40 %, Final Exam = 20 %, Assignments = 40 %, Total = 100%

Total Hours 42

Date: October 5, 2006
Course Supervisor: Nancy Amato
ABET Classification: Science 1 Design 1 Math 2 Other 0
Laboratory Requirements: None
Equipment Required: None
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December 9, 2006

MEMORANDUM

TO: Faculty Senate
FROM: Al Boggess, Head
SUBJECT: Changes in MATH 302

With this memorandum, the Mathematics Department wishes to clarify the prerequisites and focus of our Math 302 course entitled Discrete Mathematics. The audience for this course mostly consists of students in computer science. As such, it is the intent of the Mathematics Department to ensure that the content of this course aligns with the needs of the Computer Science Department. As part of the proposed overhaul of their curriculum, the Computer Science Department proposes that their students enroll in Discrete Mathematics as freshman. The stated prerequisite for Math 302 is Math 152 (Engineering Mathematics II) which currently limits most of the enrollment of Math 302 to sophomores. Through a miscommunication, the Computer Science Department received the unfortunate impression that our department would continue to enforce the stated prerequisite and thus proceeded to create their own proposed course, CPSC 222, which would cover very similar material as our own MATH 302. However, the prerequisite for Math 302 is primarily for mathematical maturity. The material covered in Math 152 is not needed in Math 302. With minor changes in level of presentation, the Mathematics Department agrees to remove the prerequisite of Math 152 for 302 thus allowing freshman computer science students to enroll in Math 302. An official course change form will be submitted soon requesting this change in prerequisite. In addition, minor content changes will be made to Math 302 in order to align it more closely with what is being proposed in CPSC 222. The details of these changes will be worked out with our respective curriculum committees.

Please contact me if you have any questions regarding this memorandum.

cc: Dr. Hank Walker, Professor of Computer Science
    Dr. Jennifer Welch, Professor of Computer Science
    Dr. Timothy Scott, Associate Dean, College of Science
    Mathematics Faculty Senators: Drs. Bangerth, Battle, Hobbs, Straube, Vogel