CIS 4190: IT Enabling the Real-time Organization
Spring 2011

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As with any document, be aware that this may contain clerical errors. Please tell me if you spot one.
The instructor reserves the right to modify the syllabus as necessary to improve student learning and provide appropriate evaluation. Students will be notified of any such modification in-class and via the web site.

1 Catalog Description
The current university catalog description of this course can be obtained in the University’s Catalog:
http://www.gsu.edu/enrollment/catalogs.html

A recent university catalog description follows:
This course introduces event-processing theory, technologies, tools to provide a foundation for IT enabling real-time organizations. The related technologies of Business Intelligence (BI) and Enterprise Architecture (EA) are considered in the context of real-time businesses where, rather than using non-real-time databases and data
warehouses, the IT enabled real-time organization continuously examine events, as they occur throughout the enterprise or business area, to look for pre-defined, complex event patterns that either should be there (and are not) or shouldn’t be there (and are) and what to do about them.

1.1 Prerequisites
Required: CIS 4120 and a GPA 2.7

1.2 Sections

<table>
<thead>
<tr>
<th>Section</th>
<th>CRN</th>
<th>Room</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
</table>

2 Instructor
Dr. William N. Robinson; [http://wrobinson.cis.gsu.edu](http://wrobinson.cis.gsu.edu); [wrobinson@gsu.edu](mailto:wrobinson@gsu.edu)
Office (404) 413-7374; Dept: (404) 413-7360; FAX: (404) 413-7394
Office hours: TBA & by Appointment. Ask me about Instant Messaging (MS Messenger Live).

2.1 Contact the instructor... Please!
During your research, design, and development, it is highly recommended that you contact the instructor, in-person or via email, concerning:

- Development questions
- Research subtopics, focus, and research approach
- Recommend readings

I am available to help you focus your projects, gain access to resources, and answer your questions. Please try to see me, phone me, or e-mail me at least once during the term to discuss your project. Your class members are also a good source of help.

2.2 Course web sites
There are two web sites for our course:

1. [http://robinson.gsu.edu](http://robinson.gsu.edu) –our main class site
2. [http://ulearn.gsu.edu](http://ulearn.gsu.edu) –the university uLearn site, which contains our quizzes

Why two sites? In my experience, uLearn is slow, unreliable, and difficult to use. However, it does have a good quiz system. So, two sites are provided, the first for daily documents and information, and the second for quizzes.

3 Overview
This course introduces the fundamentals of systems design for agile companies. Industries, such as retail and shipping, apply business intelligence to recognize important events and respond in real-time. Agile companies have two important capabilities: (1) recognizing environmental changes, and (2) adapting systems to change. Specifying awareness requirements and analyzing events at runtime allows analysts to recognize important environmental changes. Dynamically configurable component-based systems allow analysts to reconfigure systems in response to recognized needs. These issues of recognition and response will be considered in the context of modern service systems. Current theory and technology emphasize event analysis over dynamic systems adaptation, and this course will reflect that.

Students will analyze current theory, applications, systems architecture, and data analysis. Additionally, students will be exposed to emerging topics in agile systems theory and techniques. This course will give students an understanding of the common tools, techniques, and theories currently used in systems design by agile companies.
3.1 Intended Audience
Anyone with a keen interest in software development will do well in this course. It’s mainly geared to produce Business Intelligence Analysts, Systems Analysts, and Systems Architects. However, Data Analysts, Database Administrators, Programmers, Software Development Managers, and future CIO’s may benefit from this course.

3.2 Learning Objectives
Students who complete this course will gain "Ready for work“ skills, including the following:

- Specify goals of a real-time business architecture
- Specify a real-time business architecture
- Specify a software application for a real-time business
- Develop a software application for a real-time business
- Specify goals of real-time event analysis
- Analyze events acquired real-time business
- Demonstrate knowledge of standards, practices, and tools common to real-time business architectures and applications
- Demonstrate critical thinking, integrative reasoning, & communication skills

3.3 Learning Method
Each week a topic will be presented in two parts:

1. Text book theories of the topic will be presented in a common lecture format
2. Student will apply the theory in exercises in which the teacher will serve as guide and assistant—student must initiate the application of theories to the given problem

4 Schedule
Illustrative schedule based on Spring 2010.

CEP is defined in Wikipedia: **Complex event processing** (CEP) consists in **processing** many **events** happening across all the layers of an **organization**, identifying the most meaningful events within the event cloud, analyzing their impact, and taking subsequent action in real time. -- [http://en.wikipedia.org/wiki/Complex_event_processing](http://en.wikipedia.org/wiki/Complex_event_processing)
<table>
<thead>
<tr>
<th>#</th>
<th>Wk</th>
<th>Objectives</th>
<th>Topic</th>
<th>Readings</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11-17</td>
<td>Theory</td>
<td>Intro to agile business architecture</td>
<td>Chandy, ch. 1 - 3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>18-24</td>
<td>Theory</td>
<td>CEP Uses and Value</td>
<td>Chandy, ch. 4 – 5, readings</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>25-31</td>
<td>Theory</td>
<td>CEP Architecture</td>
<td>Chandy, ch. 6 – 10, presentation</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1-7</td>
<td>Development &amp; Application</td>
<td>CEP Introductory Application I</td>
<td>Bali ch. 1-4, presentation</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>8-14</td>
<td>Development &amp; Application</td>
<td>CEP Introductory Application II</td>
<td>Bali ch. 5-10, presentation</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>15-21</td>
<td>Theory</td>
<td>CEP in SOA &amp; Business</td>
<td>Chandy, ch. 9 - 10</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>22-28</td>
<td></td>
<td>Exam 1</td>
<td>Mostly theory of CEP. Some details how address by an illustrative framework (Drools)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1-7</td>
<td>Development &amp; Application</td>
<td>CEP Workflow Application</td>
<td>Sample from web</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>8-14</td>
<td></td>
<td></td>
<td>Spring break</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>15-21</td>
<td>Theory</td>
<td>CEP Best practices</td>
<td>Chandy, ch. 11 -12, presentation</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>22-28</td>
<td>Theory</td>
<td>CEP Data mining introduction</td>
<td>Reading TBD</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>29-35</td>
<td>Development &amp; Application</td>
<td>CEP Data mining application</td>
<td>Reading TBD</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>5-11</td>
<td>Theory</td>
<td>Adaptation: theory &amp; cases</td>
<td>Reading TBD</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>12-18</td>
<td>Development &amp; Application</td>
<td>Adaptation: architecture &amp; example</td>
<td>Reading TBD</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>19-25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>26-32</td>
<td>Development &amp; Application</td>
<td>Student project presentations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>3-9</td>
<td></td>
<td></td>
<td>Final M3 project due</td>
<td></td>
</tr>
</tbody>
</table>

### 5 Readings by Week

Readings provide content for class discussions. Thus, readings must be read prior the class. For example, week 1 readings must be read prior to class on week 1. The readings are in order of importance. Thus, where there is a lot of readings, you may need to scan the last articles.
5.1 References
Students must have access to the primary textbook, K. Chandy:
- Event Processing: Designing IT Systems for Agile Companies [Hardcover] K. Chandy (Author), W. Schulte (Author); must purchase.
- Drools JBoss Rules 5.0 Developer’s Guide: Develop Rules-Based Business Logic Using the Drools Platform by Michal Bali; from Ebooks (free)

Many books can be accessed from E-book from Books24x7. (Some articles are available from our web site. If not, then use the method described in section 10, How to scan CIS literature.)

Additional Readings
- TBD

5.2 E-book from Books24x7
Consider the E-books as another resource; they are free to our students. See this note: http://www2.cis.gsu.edu/cis/news/newandnoteworthy2.asp Access from the GSU online library: https://ezproxy.gsu.edu/login?qurl=http%3a%2f%2flibrary.books24x7.com. Also, search for Books24x7 in the online library Database.

Search Books24x7 for books with the title “software quality” to see related books.

5.3 Software
Additionally, much of the software is available for download, either from the instructor, or from the CIS agreements with MSDNAA and the IBM Academic Initiative.

6 Evaluation
Students are evaluated by the deliverables summarized in Table 1. The course credits are earned according to the following Table 1.

Table 1 Relative weights assigned to course deliverables.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>20</td>
</tr>
<tr>
<td>Exam 2</td>
<td>25</td>
</tr>
<tr>
<td>In class exercises</td>
<td>5</td>
</tr>
<tr>
<td>Project M1</td>
<td>5</td>
</tr>
<tr>
<td>Project M2</td>
<td>10</td>
</tr>
<tr>
<td>Project M3</td>
<td>15</td>
</tr>
<tr>
<td>Project presentation</td>
<td>5</td>
</tr>
<tr>
<td>Student special topic (theory) presentation</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

The following table overviews how credit will be assigned. Note that all group work includes a peer review, which can distinguish an individual’s assigned points from the group’s assigned points. (See Self-Managed Teams in the Workload Expectations section.)
Table 2 Grading standards.

<table>
<thead>
<tr>
<th>Work quality</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolutely fantastic, walk on water, overflow grade</td>
<td>110</td>
</tr>
<tr>
<td>Excellent answer on all counts</td>
<td>100</td>
</tr>
<tr>
<td>Excellent answer on most counts</td>
<td>90</td>
</tr>
<tr>
<td>Very good answer, but not excellent</td>
<td>80</td>
</tr>
<tr>
<td>Professionally done and adequate</td>
<td>70</td>
</tr>
<tr>
<td>Inadequate, needs work</td>
<td>60</td>
</tr>
<tr>
<td>Varying degrees of inadequacy</td>
<td>0 - 50</td>
</tr>
</tbody>
</table>

The following breakout depicts how grades will be assigned under this system.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>≥ 90</td>
</tr>
<tr>
<td>A-</td>
<td>≥ 87</td>
</tr>
<tr>
<td>B+</td>
<td>≥ 83</td>
</tr>
<tr>
<td>B</td>
<td>≥ 80</td>
</tr>
<tr>
<td>B-</td>
<td>≥ 77</td>
</tr>
<tr>
<td>C+</td>
<td>≥ 73</td>
</tr>
<tr>
<td>C</td>
<td>≥ 70</td>
</tr>
<tr>
<td>C-</td>
<td>≥ 67</td>
</tr>
<tr>
<td>D</td>
<td>≥ 60</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 60</td>
</tr>
</tbody>
</table>

7 In class exercises

Each exercise is intended as a group effort, which illustrates important concepts introduced in the associated readings. More detailed description and associated materials shall be found on the course web site.

- Deliver your results to the course web site during class (only). There shall be a blog, wiki, or document area for your submission.
  - Authors shall receive credit for each in-class exercise.
  - Prominently (at the top) of the delivered document, place the names of authors.
  - Do not include the name of anyone who is absent or did not contribute. Doing so will result in zero credit for all ‘authors’.
  - Late deliverables (after class) shall receive zero credit.

8 Homework

8.1 Group project

1. For each milestone, deliver via email:
   - A single file (zip if large) containing
     - Requirements artifacts as specified in the assignment description (see the web site)
     - Summarize group work:
       - Tasks completed by each member
       - Percentage of the total work completed by each member
Your Personal Statement

- Each team member must submit a confidential personal statement (maximum of one page per member) highlighting:
  - His or her contribution to the project
  - Comments on the contribution of other group members
  - Lessons learned from the project
  - Comments on the tool and
  - Any other issues or concerns
  - Comments about the course

Please use the following SUBJECT LINE: CIS 8300-F10-personal-statement

Do NOT use attachments. Submit it as text in the body of the message.

9 Examinations

Online review guides to be updated one-half week prior to the exam.

9.1 Exam 1

See the online exam review for a description.

9.2 Exam 2

Comprehensive! Similar in nature to a certification exam. See the online exam review for a description.

10 How to scan CIS literature

10.1 Software

Install EndNote:

1. Free EndNote @ GSU

10.2 Literature review

Search for peer reviewed articles using keywords:

2. Scan the web
   a. www.google.com
3. Scan the web using scholar search engines
      i. Set the Google Scholar Preferences to
         1. Show library access links for Georgia State University
         2. Show links to import citations into EndNote
   c. http://citeseer.ist.psu.edu/
4. Scan using library databases (@GSU)
   a. http://www.galileo.usg.edu
   b. In particular, the following databases
      i. ABI/INFORM Complete
      ii. ACM Digital Library
      iii. IEEE Xplore

11 Workload Expectations

Students should plan for 2 - 3 hours of work outside of class each week for each course credit hour. Thus, a 3-credit course averages between 6 and 9 hours of student work outside of the classroom, each week. See GSU sites for Academic Success:

- http://www2.gsu.edu/~wwwcam/incept/successtips.html
Students must take responsibility for their learning. In contrast to high school, college has fewer opportunities for student-teacher interactions. Consequently, students must prepare to gain the most from each interaction.

**Self-Managed Teams:** Teams will be allowed for some activities during the term. Please note that unless the activity is explicitly identified as a "team activity", I expect everyone to perform their own work (your hands on the keyboard). For team activities, you will be allowed to work with partners (of your choosing).

- Initial teams must be established by the second week of classes. Established teams may continue working together on subsequent team activities. Team membership may change during the term, if problems arise. However, team members must be designated within one week of the due date for the team activity. Exception: you may withdraw from a team at any time and submit an assignment individually.
- Teams will submit one assignment for all team members. In most cases, each member of the team will get the same score. However, an individual's score may be reduced at the discretion of the instructor.

**Each team assignment must include the following:**
- Tasks completed by each member.
- Percentage of the total work completed by each member.
- Any individual with a low team contribution will be removed from their team.

**Arbitration:** There will be a one-week arbitration period after graded activities are returned. Within that one-week period, you are encouraged to discuss any assumptions and/or misinterpretations that you made on the activity that may have influenced your grade.

**Attendance:** If you are unable to attend a class session, it is your responsibility to acquire the class notes, assignments, announcements, etc. from a classmate. The instructor will not give private lectures for those that miss class.

**Submission of Deliverables:** Unless specific, prior approval is obtained, no deliverable will be accepted after the specified due date.

If you have a legitimate personal emergency (e.g., health problem) that may impair your ability to submit a deliverable on time, you must take the initiative to contact the instructor before the due date/time (or as soon after your emergency as possible) to communicate the situation.

**Make-up exams will not be given:** However, if a student has a planned absence, he or she may take the exam earlier with the permission of the instructor.

**12 Student Behavior**

Behavior in class should be professional at all times. People must treat each other with dignity and respect in order for scholarship to thrive. Behaviors that are disruptive to learning will not be tolerated and may be referred to the Office of the Dean of Students for disciplinary action.

**12.1 Discrimination and harassment**

Discrimination and/or harassment will not be tolerated in the classroom. In most cases, discrimination and/or harassment violates Federal and State laws and/or University Policies and Regulations. Intentional discrimination and/or harassment will be referred to the Affirmative Action Office and dealt with in accordance with the appropriate rules and regulations.

Unintentional discrimination and/or harassment is just as damaging to the offended party. But, it usually results from people not understanding the impact of their remarks or actions on others, or insensitivity to the feelings of others. We must all strive to work together to create a positive learning environment. This means that each individual should be sensitive to the feelings of others, and tolerant of the remarks and actions of others. If you find the remarks and actions of another individual to be offensive, please bring it to their attention. If you believe those remarks and actions constitute intentional discrimination and/or harassment, please bring it to my attention.

**12.2 Official CIS department class policies**

1. Prerequisites are strictly enforced. Students failing to complete any of the prerequisites with a grade of “C” or higher will be administratively withdrawn from this course with loss of tuition fees. **There are no exceptions, except as granted by the instructor with the approval of the department.**
2. Students are expected to attend all classes and group meetings, except when precluded by emergencies, religious holidays, or bona fide extenuating circumstances.

3. Students who, for non-academic reasons beyond their control, are unable to meet the full requirements of the course should notify the instructor, by email, as soon as this is known and prior to the class meeting. Incompletes may be given if a student has ONE AND ONLY ONE outstanding assignment.

4. A "W" grade will be assigned if a student withdraws before mid-semester if (and only if) he/she has maintained a passing grade up to the point of withdrawal. Withdrawals after the mid-semester date will result in a grade of "WF". See the GSU catalog or registrar’s office for details.

5. Spirited class participation is encouraged and informed discussion in class is expected. This requires completing readings and assignments before class.

6. All exams and individual assignments are to be completed by the student alone with no help from any other person.

7. Collaboration within groups is encouraged for project work. However, collaboration between project groups will be considered cheating.

8. Copying work from the Internet without a proper reference is considered plagiarism and subject to disciplinary action as delineated in the GSU Student Handbook.

9. Any non-authorized collaboration will be considered cheating and the student(s) involved will have an Academic Dishonesty charge completed by the instructor and placed on file in the Dean’s office and the CIS Department. All instructors regardless of the type of assignment will apply this Academic Dishonesty policy equally to all students. Abstracted from GSU’s Student Handbook Student Code of Conduct “Policy on Academic Honesty and Procedures for Resolving Matters of Academic Honesty”

a. http://www2.gsu.edu/~7Ewwwdos/codeofconduct_conpol.html

b. http://www2.gsu.edu/~wwwcam/

As members of the academic community, students are expected to recognize and uphold standards of intellectual and academic integrity. The University assumes as a basic and minimum standard of conduct in academic matters that students be honest and that they submit for credit only the products of their own efforts. Both the ideals of scholarship and the need for fairness require that all dishonest work be rejected as a basis for academic credit. They also require that students refrain from any and all forms of dishonorable or unethical conduct related to their academic work.

Students are expected to discuss with faculty the expectations regarding course assignments and standards of conduct. Here are some examples and definitions that clarify the standards by which academic honesty and academically honorable conduct are judged at GSU.

**Plagiarism.** Plagiarism is presenting another person’s work as one’s own. Plagiarism includes any paraphrasing or summarizing of the works of another person without acknowledgment, including the submitting of another student’s work as one’s own. Plagiarism frequently involves a failure to acknowledge in the text, notes, or footnotes the quotation of the paragraphs, sentences, or even a few phrases written or spoken by someone else. The submission of research or completed papers or projects by someone else is plagiarism, as is the unacknowledged use of research sources gathered by someone else when that use is specifically forbidden by the faculty member. Failure to indicate the extent and nature of one’s reliance on other sources is also a form of plagiarism. Any work, in whole or part, taken from the Internet or other computer based resource without properly referencing the source (for example, the URL) is considered plagiarism. A complete reference is required in order that all parties may locate and view the original source. Finally, there may be forms of plagiarism that are unique to an individual discipline or course, examples of which should be provided in advance by the faculty member. The student is responsible for understanding the legitimate use of sources, the appropriate ways of acknowledging academic, scholarly or creative indebtedness, and the consequences of violating this responsibility.

**Cheating on Examinations.** Cheating on examinations involves giving or receiving unauthorized help before, during, or after an examination. Examples of unauthorized help include the use of notes, texts, or “crib sheets” during an examination (unless specifically approved by the faculty member), or sharing information with another student during an examination (unless specifically approved by the faculty member). Other examples include intentionally allowing another student to view one’s own examination
and collaboration before or after an examination if such collaboration is specifically forbidden by the faculty member.

**Unauthorized Collaboration.** Submission for academic credit of a work product, or a part thereof, represented as its being one’s own effort, which has been developed in substantial collaboration with another person or source or with a computer-based resource is a violation of academic honesty. It is also a violation of academic honesty knowingly to provide such assistance. Collaborative work specifically authorized by a faculty member is allowed.

**Falsification.** It is a violation of academic honesty to misrepresent material or fabricate information in an academic exercise, assignment or proceeding (e.g., false or misleading citation of sources, the falsification of the results of experiments or of computer data, false or misleading information in an academic context in order to gain an unfair advantage).

**Multiple Submissions.** It is a violation of academic honesty to submit substantial portions of the same work for credit more than once without the explicit consent of the faculty member(s) to whom the material is submitted for additional credit. In cases in which there is a natural development of research or knowledge in a sequence of courses, use of prior work may be desirable, even required; however the student is responsible for indicating in writing, as a part of such use, that the current work submitted for credit is cumulative in nature.