Data 202
Information Systems and Data Management (3)
Fall, 2016

Instructor: Pat Bailey, x67543, pmb4@calvin.edu, NH 291
Office Hours: TBD
Meeting Time: 12:30; MW: Lecture, SB382; F: Lab, SB354
Required Text: Murach’s C# 2015, Murach and Boehm, ISBN: 9781890774943

Online Texts: Enterprise Resource Planning and Supply Chain Management, Karl. E. Kurbel
Semantic Web Services, Fensel et al
http://www.springerlink.com/content/978-3-642-19192-3/#section=926897&page=7&locus=3
Pro ASP.NET Web API: HTTP Web Services in ASP.NET, Tugberk Ugurlu et al.
XBRL for Interactive Data - Engineering the Information Value Chain
Roger Debreceny, Carsten Felden, Bartosz Ochocki, Maciej Piechocki and Michal Piechocki
http://www.springerlink.com/content/978-3-642-01436-9/contents/

Catalog Description: An exploration of data ecosystems for the collection, storage, preparation, and processing of data through its lifecycle and at various scales, from desktop to parallel cloud systems. Students will learn to address the challenges in collecting, consolidating, preparing, and processing data for large and very large scale research projects. Specific topics include standards in data encoding, data formatting, data exchange between disparate systems, the general components of enterprise systems, data cleansing, database systems (relational and NoSQL), and cloud technologies to store and accelerate the processing of very large data sets using parallelism. Students will explore the many sources from which data are collected, including enterprise systems, the internet of things and data streams, as well as tools for their real time analysis. Laboratory. Prerequisites: a) IS 175, Data 101, or both IS 141 and 171; b) Computer Science 104, 106, or 108. A minimum grade of C in CS 108, 104 or 106 is required.

Overview of Course: This course explores Information Systems through a perspective of how data flows through and is used by an organization. Data has grown at exponential rates, and it is considered the next “oil” industry. To mine that oil, future information systems people must understand the source, context and general nature of data (structured or unstructured). To that end, the course starts with an understanding of data from a foundational computing and storage perspective and progresses to higher levels of abstraction and usage at both operational and strategic levels in the organization. Concepts are reinforced with hands-on programming or system installation exercises. Technology assignments will include examples of requirements/use cases and business rules that will be implemented.

Outcomes for the Course: Students are expected to master technical subjects and skill sets to support planning and working on a team. At the completion of the course, students should be able to:

1. Use technology to plan and execute work in a team.
2. Explain the systems view of the data life cycle.
3. Be able to describe the software components of an enterprise system (e.g. ERP)
4. Apply the appropriate structure, formatting and processing for usage of data within and between systems
5. Develop web 2.0 technologies with the Microsoft .Net framework
6. Apply algorithmic concepts to the analysis of data in a distributed parallel framework such as Hadoop, Spark, or similar technology.
7. Extract data from multiple sources (e.g., SQL vs. No-SQL databases, structured vs. unstructured files, streamed vs. static data), transform it as needed, and load the data into other systems for further analysis, appropriately selecting technology for the scale and complexity of the data involved.
8. Understand Christian perspectives and issues of ethics and compliance as they relate to data

Evaluation: The table below outlines specific areas of evaluation and their associated points.

<table>
<thead>
<tr>
<th>Evaluated Area</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>100</td>
</tr>
<tr>
<td>Technology Assignments</td>
<td>250</td>
</tr>
<tr>
<td>Mid Term</td>
<td>100</td>
</tr>
<tr>
<td>Final (Comprehensive)</td>
<td>150</td>
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<tr>
<td>Total</td>
<td>600</td>
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Grades: Grades are assigned based on the percentage of available points in the course as follows: 93% = A; 83% = B; 70% = C; 55% = D. The award of plus or minus is up to the instructor’s discretion and is not always based on points.

Explanation of Evaluation Areas:
Team Assignment: Some assignments will be team based. The class will organize teams based on the assignment needs. Not all team members necessarily receive the same grade for an assignment. Prior to a team assignment, the team will identify the responsibilities for each team member. So, part of the individual grade for a team assignment is based on how well the individual task was completed.

Quizzes, assignments and exams: Quizzes will typically be given during the first 15 minutes of class when scheduled. The midterm and final exam will reflect all the material covered within the quizzes, lectures and exercises up to that time.

Hands-on Technology: We are in a lab environment each Thursday. We will often immediately have a direct hands-on approach to exploring. This includes programming and use of visualization tools. Labs provide critical experience to understand theoretical concepts. Labs are a scheduled part of the class, you are expected to attend.

Course Schedule: Soon to be published

*In addition to the reading listed here, you are expected to read the appropriate chapters from the other sources when referenced on Moodle or in an assignment.

++Team based assignment

General Administrative Notes:
Files: Basic files needed for your exercises will be posted on Moodle. Exam and Assignment Policy: Each student is required to take all tests at the scheduled times. All exceptions must be cleared with the instructor prior to the test time. Tests/quizzes missed for insufficient reason will be assigned a score of zero. Assignments and projects: Unless otherwise stated, assignments are due by at the start of class on the due date – it is your responsibility to ensure the instructor or grader has received the work. Excuses such as “my email wasn’t working” or I couldn’t find the grader are not acceptable reasons for late turn-ins. Attendance: Students are responsible for any material covered, tests, or announcements made in class. There is a direct relationship between attendance and your grade.

Special Needs: Calvin College will make reasonable academic accommodations for persons with disabilities. Students should notify Student Academic Services if they have a documented disability. Students with disabilities should meet with their instructors during the first two weeks of class to discuss academic accommodations.