CS 3810 Introduction to Enterprise Operating Systems

Spring Semester 2016
Technical Education (TE), Room TBD
TBD

Instructor: Dr. Hugo Valle
Office Hours: TBD.
Office: TE 110D
Phone: 801-626-7684
Email: hugovalle1@weber.edu

Required Textbook:
• Introduction to the New Mainframe: z/OS Basics, 3rd Edition (Paperback), 2011, IBM Redbooks (ibm.com/redbooks). A PDF version may be downloaded from the Academic Initiative or from the course’s Canvas web site.

Suggested Textbooks:
• TBD

Website: Canvas

COURSE DESCRIPTION AND OBJECTIVES:
This course provides an integrated view of using IBM zEnterprise system. An overview of zEnterprise hardware is covered. The roles of virtual and physical storage, LPARs, Parallel Sysplex, z/VM, zLinux, and cluster technologies to provide hands-on experiences using z/FS data sets, ISPF, SDSF, JCL, and JES3. A batch application will be edited, compiled, linked, and executed and debugged in both z/OS and zLinux environment. An introduction to emerging technologies such as proxy coupling will be presented. Access to a zEnterprise system, hands-on exercises, and online support materials are important components of this course. Finally, the students will get the opportunity to participate in the IBM Master the Mainframe contest. This is a good opportunity for students to gain real-world experience using enterprise-computing skills.

For optimal learning, students are assumed to have successfully completed an introductory course in computer system concepts, such as computer organization and/or operating systems. They should also have successfully completed courses in one or more programming languages, and be PC literate.

Undergraduate Prerequisites:
• CS 1410 (Object Oriented Programming)
• CS2810 (Computer Architecture and Organization)

Graduate Prerequisites: None
Course Outcomes
Upon successful completion of this course, the student shall be able to:
  • Describe the advantage, workloads, and roles in zEnterprise systems, e.g., stability, high
    availability, security, batch, time sharing, OLTP, system versus application programmer,
    basic system administration, operations, etc.
  • Describe and explain the role of zEnterprise hardware components and advantages of
    mainframe enterprise architecture, e.g., processors, LPARs, I/O connectivity, DASD,
    Clustering Services and Parallel Sysplex.
  • Describe and explain the features and functions of the z/OS operating system and
    middleware, e.g. multiprogramming/interrupts, multiprocessing, addressing, virtual
    storage, task scheduling, integration with open source platforms, etc.
  • Describe, explain, and use z/OS interactive facilities and tools such as TSO/e, ISPF, Linux,
    FTP, ssh, CLIST, and REXX.
  • Describe, explain or use the z/FS file system concepts and utilities, e.g., volumes,
    datasets, system and user catalogs, VTOC and access methods
  • Describe, explain, and use basic JCL commands and parameters, e.g., JOB, EXEC, DD,
    and PROC
  • Use ISPF to edit a batch application, then submit a JCL job to JES3 to compile, link, and
    execute the load module. Use SDSF to review the job output queue to debug JCL and
    application development errors
  • Write, compile, and execute a program in zOS, then transfer files to a zLinux system,
    recompile and execute program again. Compare the results from both systems.

ABET Accreditation Program Objectives
  • An ability to apply knowledge of math, science, and engineering
  • An ability to design and implement programs as well as to analyze and interpret code and
    data.
  • An ability to design a system, component, or process to meet desired needs.
  • An ability to identify, formulate and solve computing problems.
  • An ability to communicate effectively.
  • The broad education necessary to understand the impact of computing solutions in a global
    and societal context.
  • Knowledge of contemporary issues.
  • An ability to use the techniques, skills, and modern computing tools necessary for
    computing practice.

STUDENTS WITH DISABILITIES
Students who have special needs or disabilities that may affect their ability to access information
and/or material presented in this course are encouraged to contact the Service for Students with
Disabilities (SSD), on campus at 801-626-6413 for additional disability related educational
accommodations. You are not required to disclose these abilities to your instructor, but the
instructor can only accommodate accommodation requests that officially come through the DSS.

ALLOCATED TIME
You should anticipate spending two to three hours of study per week for each credit hour of a
university course. Computer and programming classes typically require time in the upper range
(12-15 hours).
QUIZZES (5% of grade)
Quizzes will generally be assigned on the weekly basis. But a quiz may not be assigned every week, due to timing of holidays, exams, and course progress. Weekly quizzes will be given on the material covered the prior week’s lectures in class. The quizzes will consist of multiple choice, true/false, fill in the blank, and essay questions. As long as you read your book and attend class, you should have no problem receiving a good score for your quiz. I will drop the lowest quiz grade.

EXAMS (20% of grade)
There will be two exams in this course, a midterm and a final. All exams will be comprehensive, timed, and administer through Chi Tester. They will be made available through all University testing centers. It is your responsibility to check and plan ahead for the hours of the testing center. If you live over 50 miles away from WSU testing facility you need to arrange a proctor for yourself. For more information go here: http://departments.weber.edu/ce/distancelearning/testing.aspx

HOMEWORK, PROGRAMMING ASSIGNMENTS, AND LAB ASSIGNMENTS (70% of grade)
There will be ## homework assignments. Lab assignments will be given during the semester. The lab assignments should help you to learn zEnterprise operating systems concepts one task at a time. Assignments are typically due on Saturday at 11:59 pm. You will turn in your lab assignments by marking the assignment complete in Canvas and making a text entry with your file name. Naming of files is critical to grading so please name your folders and files exactly as specified in the lab description and ensure that your program is executable. Lab assignments are due on the date listed in Canvas. Please refer to the Calendar in Canvas for lab assignment due dates.

If you plan to do software and/or hardware development after graduation, you will almost certainly need to know to work in groups. For some of the assignments in this class, you will need to form into groups of 2 or 3 people; the assignments will be the same no matter what size group you have. In order to ensure everyone in the group does their fair share of the work, we will ask each of you to turn in assessments of the relative contributions of your project partners. Many employers do this, by the way, in determining salaries and bonuses.

Late Submission Policy:
We will use flexible slip dates for the programming assignments (not for quizzes or exams). Each student is given an automatic extension of 5 calendar days. You can use the extension on any assignment during the semester. For instance, you can hand in one assignment 5 days late, or each of the five assignments 1 day late. For group assignments, the slip date will be deducted from each team member’s remaining slip time. This should let you schedule due dates around the due dates for other courses.

After you have used up your slip dates, any assignment/quiz submitted late will be penalized according to the following chart:
1 Day Late -10%
2 Days Late -30%
3 Days Late -50%
4 or more Days Late -100%

Note: The submission time of your assignments/quizzes will be the timestamp shown in the canvas system. Any assignment/quiz submitted after 3 days will receive no credit. I will not accept late work after the graduation day.

ATTENDANCE/PARTICIPATION (5% of grade)
This class is a face-to-face format so attendance and participation is part of your grade. I will begin taking attendance after the first week of classes. In order to get full credit (5%) you need to attend to 80% of the classes. The following criteria will be used to grade your attendance:

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<thead>
<tr>
<th>Attendance Percent</th>
<th>Grade Percentage</th>
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<tbody>
<tr>
<td>80% - 100%</td>
<td>5%</td>
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<tr>
<td>75%-79%</td>
<td>4%</td>
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<tr>
<td>70%-74%</td>
<td>3%</td>
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<tr>
<td>65%-69%</td>
<td>2%</td>
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<tr>
<td>60%-64%</td>
<td>1%</td>
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<td>Below 60%</td>
<td>0%</td>
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GRADING
Your final grade will be calculated according to the following chart:

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<tbody>
<tr>
<td>Homework/Lab Programs</td>
<td>70%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>5%</td>
</tr>
<tr>
<td>Exams (two, 10% each)</td>
<td>20%</td>
</tr>
<tr>
<td>Participation/Attendance</td>
<td>5%</td>
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</tbody>
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LETTER GRADING SCALE

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Percentage Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>94-100%</td>
</tr>
<tr>
<td>A-</td>
<td>90-93.9%</td>
</tr>
<tr>
<td>B+</td>
<td>87-89.9%</td>
</tr>
<tr>
<td>B</td>
<td>84-86.9%</td>
</tr>
<tr>
<td>B-</td>
<td>80-83.9%</td>
</tr>
<tr>
<td>C+</td>
<td>77-79.9%</td>
</tr>
<tr>
<td>C</td>
<td>74-76.9%</td>
</tr>
<tr>
<td>C-</td>
<td>70-73.9%</td>
</tr>
<tr>
<td>D+</td>
<td>67-69.9%</td>
</tr>
<tr>
<td>D</td>
<td>64-66.9%</td>
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</tbody>
</table>
**THE “I REALLY, REALLY NEED TO GET A C” POLICY**

The most effective method for obtaining a C or above in this class is to submit assignments when they are due and to stay current with course topics. The curriculum is carefully designed to fit the number of course weeks. In order to uphold academic rigor and integrity, student grades must be based on the degree to which the course requirements listed in the syllabus are fulfilled. Extra credit assignments are not allowed. If you approach me anytime during the term claiming that special allowance should be made because you need a C to move forward in the program, graduate, receive financial aid, etc., I will decline your request and refer you to this clearly worded policy.

**OTHER IMPORTANT INFORMATION**

**Cell phones:** use the vibrate mode only. If you need to answer a call, please do so outside the classroom. **Absolutely no text messaging allowed.** If you must take an emergency call or page, quietly leave the classroom to conduct your conversation. We will be using computers in classrooms. Please ensure that all classroom computer activity is directly related to the lecture or assignment.

**Emergency campus closure:** In the event of an extended campus closure, I will continue to provide instruction by utilizing Canvas, the online course system. I will expect you to log in to the system on a regular basis to keep up with coursework. Assignments will be provided through the online system with clear due dates and expectations. Discussions will be made available to allow you to interact with other students and me about course material. I will check my Weber email on a daily basis should you need to communicate with me personally. It is imperative that I am able to contact you and that I have accurate contact info on you. You are responsible for checking your Weber e-mail or for having Weber messages forwarded to accounts you do check.

**Proper Use of Email**

Always include your course name and section in the subject header in any email. I normally answer email messages within 48 hours (2 business days). But, most answers could be found in the syllabus or in the course’s Canvas page. If you do not get a response within 48 hours, please resend your email message.

**Academic dishonesty or Cheating**

Students are expected to maintain academic ethics and integrity in regards to performing their own work. The WSU Student Code states and clarifies cheating.

Cheating, which includes but is not limited to:
1) Copying from another student's test paper;
2) Using materials during a test not authorized by the person giving the test;
3) Collaborating with any other person during a test without authority;
4) Knowingly obtaining, using, buying, selling, transporting, or soliciting in whole or in part the

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>D-</td>
<td>60-63.9%</td>
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<tr>
<td>E</td>
<td>Below 60%</td>
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</tbody>
</table>
Contents of any test, without authorization of the appropriate official;
5) Bribing any other person to obtain any test;
6) Soliciting or receiving unauthorized information about any test;
7) Substituting for another student or permitting any other person to substitute for oneself to take a test.

b. Plagiarism, which is the unacknowledged (uncited) use of any other person or group's ideas or work. This includes purchased or borrowed papers;
c. Collusion, which is the unauthorized collaboration with another person in preparing work offered for credit;
d. Falsification, which is the intentional and unauthorized altering or inventing of any information or citation in an academic exercise, activity, or record-keeping process;
e. Giving, selling or receiving unauthorized course or test information;
f. Using any unauthorized resource or aid in the preparation or completion of any course work, exercise or activity;
g. Infringing on the copyright law of the United States which prohibits the making of reproductions of copyrighted material except under certain specified conditions;

Depending on its severity, it may result in a failure of the assignment/paper, or even the course. All cases of academic dishonesty will be reported to the Dean of Students. If you have questions or concerns, please refer to the WSU PPM (Policies and Procedures Manual).

CS Department policy dictates that any verifiable evidence of students' academic cheating, as defined by the instructor, will result in: 1) an automatic failing grade for the class and 2) a report to the Dean of Students that will include the student's name and description of the student's dishonest conduct.

Emergency campus closure: In the event of an extended campus closure, I will continue to provide instruction by utilizing Canvas, the online course system. I will expect you to log in to the system on a regular basis to keep up with coursework. Assignments will be provided through the online system with clear due dates and expectations. Discussions will be made available to allow you to interact with other students and me about course material. I will check my Weber email on a daily basis should you need to communicate with me personally. It is imperative that I am able to contact you and that I have accurate contact info on you. You are responsible for checking your Weber e-mail or for having Weber messages forwarded to accounts you do check.
# DAILY SYLLABUS

(Tentative. Please follow Canvas calendar)

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Assignments</th>
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<tbody>
<tr>
<td>1</td>
<td>01/11/16</td>
<td>Announcements and Introductions&lt;br&gt;Syllabus and Schedule Review&lt;br&gt;zOS and zLinux access&lt;br&gt;Introduction to the new mainframe</td>
<td>Last day to add online (Friday)&lt;br&gt;Reading: Ch1</td>
</tr>
<tr>
<td>2</td>
<td>01/18/16</td>
<td>Master the Mainframe signup&lt;br&gt;Mainframe Hardware System and High Availability</td>
<td>Martin Luther King Day(Monday)&lt;br&gt;No Classes&lt;br&gt;Reading: Ch2</td>
</tr>
<tr>
<td>3</td>
<td>01/25/16</td>
<td>Overview of the zOS Enterprise Operating System</td>
<td>Reading: Ch3</td>
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<td>4</td>
<td>02/01/16</td>
<td>TSO/E, ISPF, and UNIX: Interactive Facilities of z/OS</td>
<td>Last day to cancel (CL) semester (Monday)&lt;br&gt;Reading: Ch4</td>
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<tr>
<td>5</td>
<td>02/08/16</td>
<td>Working with Datasets and zFS system</td>
<td>Reading: Ch5</td>
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<tr>
<td>6</td>
<td>02/15/16</td>
<td>Job Control Language (JCL)</td>
<td>Presidents' Day (Monday)&lt;br&gt;No Classes&lt;br&gt;Reading: Ch6</td>
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<tr>
<td>7</td>
<td>02/22/16</td>
<td>Introduction to Batch Processing and Job Entry Subsystem (JES)</td>
<td>Reading: Ch7</td>
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<tr>
<td>8</td>
<td>02/29/16</td>
<td><strong>Midterm Exam</strong></td>
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<td>9</td>
<td>03/07/16</td>
<td><strong>Spring Break</strong></td>
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<tr>
<td>10</td>
<td>03/14/16</td>
<td>Design and developing Application for z/OS</td>
<td>Reading: Ch8</td>
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<tr>
<td>11</td>
<td>03/21/16</td>
<td>Using Programming Languages on z/OS</td>
<td>Reading: Ch9</td>
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<tr>
<td>12</td>
<td>03/28/16</td>
<td>Compiling and Link-editing Programs in z/OS</td>
<td>Last day to withdraw (W), or declare CR/NC or Audit for semester (Tuesday)&lt;br&gt;Reading: 10</td>
</tr>
<tr>
<td>13</td>
<td>04/04/16</td>
<td>Introduction to Proxy Coupling Technology</td>
<td>Reading: Lecture Notes</td>
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<tr>
<td>14</td>
<td>04/11/16</td>
<td>Final Project Part 1: z/OS and zLinux exercise</td>
<td>Reading: Lecture Notes</td>
</tr>
<tr>
<td>15</td>
<td>04/18/16</td>
<td>Final Project Part 2:</td>
<td>Reading: Lecture Notes</td>
</tr>
<tr>
<td>16</td>
<td>04/25/16</td>
<td>Final Exams, Graduation/Commencement</td>
<td>Last day of classes (Friday)&lt;br&gt;Graduation (Friday)</td>
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