Information Sciences and Technology Department

Course Syllabus

IT 342 Operating Systems Fundamentals
Revised 9/8/2015
Tuesday 7:20 to 10:00 Bull Run Hall Room 257

Catalog Description
Practices and procedures for installing and configuring modern operating systems, including user accounts, file, print, and terminal servers, mobile computing, and disaster recovery. Through practical lab sessions, students receive real-world experiences with multiple operating systems.

Prerequisites
To be eligible to take IT342, students must have already completed, earning at least a grade of C in each, these courses:
- IT 101 Introduction to Information Technology
- IT 212 Computer Hardware Fundamentals or IT 105 IT Architecture Fundamentals
- IT 106 Introduction to IT Problem Solving using Computer Programming or CS 112 Introduction to Computer Programming or IT 196 Review of IT Problem Solving Using Computer Programming

If you do not understand the material from these courses, you will not master the material in this class.

Educational Objective
This course is designed to give students an understanding of the central concepts that make contemporary operating systems work. Knowing the how and why behind OS will allow you to plan a better fit for system management and overall resource or project management. It is not the intent of the course to provide details on what particular commands are used in a given OS to perform a particular function; rather, given an understanding of the OS functions, you can always look up the needed command. The course presents these underlying OS concepts, and illustrates many of them in class using a popular proprietary OS (Microsoft Windows). Examples of other Operating Systems will be sprinkled throughout the course.

By taking this course, students will:
- Understand the role of Operating Systems to the end business
- Be able to access Operating system choices in a given environment
- Be able to discuss OS concepts and determine issues related to the proposed environment
- Be able to think critically about the OS trade-offs
Major Topics

On successful completion of this course, students will be able to:

- OS Fundamentals
- Performance Measures
- Input/output
- Files
- Memory
- Processes
- Coordination
- Scheduling
- Multiple Processors
- User Interaction
- Special Topics (working on Gaming, Multimedia, Security, Embedded Systems, Main Frames, and Networks)

Textbook

Required

Test Out Windows Client Pro
See the order instruction sheet on blackboard to directly purchase from the manufacturer or obtain through the bookstore. Once purchased see the installation instruction sheet to link it with this course. Only the Windows Client Pro is required
Course notes will be provided

Optional

Operating Systems: Internals and Design Principles

Modern Operating Systems, 3rd ed
Andrew S. Tanenbaum
Prentice Hall

Linux Kernel in a Nutshell, A Desktop Quick Reference
Greg Kroah-Hartman, , O'Reilly 2007,

Understanding the Linux Kernel, 3rd Edition
Daniel P. Bovet and Marco Cesati, , O'Reilly 2006,
ISBN 978-0-596-00565-8

Linux Pocket Guide
Daniel J. Barrett
O'Reilly
ISBN 0-596-00628-4

Windows XP Pocket Guide
David Karp
O'Reilly
ISBN 0-596-00425-7
Instructor

James F. Holdener, P.E.
Phone: 703 983-2343 (I check this number daily during the week)
Email: jholdene@gmu.edu
Email is the best method to get hold of me. Put IT342 in the subject line to alert me.
Office Hours: By Appointment Occoquan Room 228, phone, or online

Teaching Assistant

Khondkar Islam
Phone:
Email: kislam2@gmu.edu
Office Hours: TBD

Grading

Grades will be awarded per the GMU Grading System for undergraduate students. See the university catalog for policies: http://www.gmu.edu/catalog.

The grading scale for this course is:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A+</td>
<td>&gt; 97%</td>
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<tr>
<td>A</td>
<td>&gt; 93% -- 97%</td>
</tr>
<tr>
<td>A-</td>
<td>&gt; 90% -- 93%</td>
</tr>
<tr>
<td>B+</td>
<td>&gt; 87% -- 90%</td>
</tr>
<tr>
<td>B</td>
<td>&gt; 83% -- 87%</td>
</tr>
<tr>
<td>B-</td>
<td>&gt; 80% -- 83%</td>
</tr>
<tr>
<td>C+</td>
<td>&gt; 77% -- 80%</td>
</tr>
<tr>
<td>C</td>
<td>&gt; 73% -- 77%</td>
</tr>
<tr>
<td>D</td>
<td>&gt; 60% -- 73%</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 60%</td>
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</tbody>
</table>

A grade of “D” is considered a passing grade for undergraduate courses. However, a minimum grade of “C” is required in the BSIT program for any course that is a prerequisite for one or more other courses.

Final grades will be determined based on the following components:

<table>
<thead>
<tr>
<th>Graded Activity</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Participation</td>
<td>5%</td>
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<tr>
<td>Lab</td>
<td>25%</td>
</tr>
<tr>
<td>Current Event</td>
<td>10%</td>
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<tr>
<td>Poster</td>
<td>10%</td>
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<tr>
<td>Midterm</td>
<td>20%</td>
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<tr>
<td>Final Exam</td>
<td>30%</td>
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</table>

I may adjust the raw scores to calculate final grades.

Late submissions will not be accepted for any graded activity, unless there are truly compelling, severe circumstances supported by appropriate documentation. All assignments are due by 7:20 PM on the date due.

Final grades will be posted to Patriot Web about 2 days after the final examination. I will give you the opportunity to see your grade in blackboard before this and to correct any errors. Once it is posted to Patriot Web, no changes will be made.
Participation

This grade will be determined by your in class discussion, questions, and responses posted to the discussion forums and any quizzes that are administer. I do not have any quizzes planned for the semester but if it appears, based on class discussion, that preparation is lacking I may administer a quiz at any time during the lecture. It is highly encourages that you come prepared for these quizzes beforehand. The content of the quiz will be all material covered prior to the start of the days class.

Labs:

Lab work is on the schedule and will be conducted through Test Out. The weeks shown are approximate except that you must finish the indicated section within 2 weeks of the indicated date (e.g. 1.0 must be completed by 9/15 7:20). All labs must be completed by 12/15. Your performance will be evaluated by the questions and effort put into the labs.

Current Event

You will need to spend some time looking at trade rags. I will post examples of typical articles on blackboard. The submission will be a bibliography of the material using the APA Style format. Each bibliographic entry will be annotated and evaluated. One article per week is required (12 total). The material needs to be related to IT and more specifically Operating Systems. You may submit an entry for an evaluation by the date shown in the syllabus. This will help ensure you are completing the assignment correctly. As you must annotate each entry you will need to read the article. As you need to evaluate the entry you must do some additional search to check on the viability of the article. Some of this material will be used for your Poster.

Poster:

You will prepare poster that will condense the material of about half your Current Event articles. On the final class meeting day you will demonstrate your poster to students in a Poster Session. This will include a 30 section brief to the class orally to entice the class to come talk to you at your poster, talking material at your poster, and material on your poster to refer to. I will visit each of your posters to discuss it. There will be two sections of posters so you will have time to visit at least half of the other posters. You will prepare an evaluation of each of the posters in the opposite group and your evaluation will be part of your participation grade. Your poster will be easier to produce if half of your current event articles have a theme. You must also submit your poster and talking points on blackboard. Your poster should clearly show the topic is related to operating systems and IT.

Exams

The Midterm and Final will each be in two parts. A multiple choice/multiple answer section will be provided through the Test Out lab. This will consist of canned questions provided by the lab plus additional questions added based on the lecture material. This will be a timed examination. It should be taken closed book but given the format I cannot guarantee this will be the case. You will not have a lot of time to look up the questions. The second part of the examination will be in class and will consist of calculation questions and essay questions.

- All exams will be closed book and closed notes. You will be permitted one 8 1/2 x 11 page (one side) as a reference. A standalone, non-graphing, non-programmable calculator is permitted, but calculator sharing will not be permitted during any exam. Calculators that are part of cell phones will not be permitted. All other material will be provided during the examination.
- Students without proper identification (e.g. GMU ID or Driver’s License) will not be admitted to any exam.
- No student may leave the classroom with the first 30 minutes of any exam.
- Exams are retained by the IST department and will not be returned to students. You will be given an opportunity to review your midterm and may arrange to see your final.
- The final exam will be comprehensive with an emphasis on the later part of the course.

The midterm and final exam will be conducted in our classroom. The dates and times are in the schedule portion of this syllabus.
Bonus

Periodically (ideally once per week) I will post a topic for students to prepare a 10-minute audio-visual presentation on the topic. The presentation will be posted in the discussion section of blackboard that will be available to the class. Students are encouraged to engage in discussion about the presentation and ask questions about it. The student who posted the presentation should respond to the questions posted by the other students regarding her or her presentation. At least two weeks of discussion should be tracked by the student. For each presentation posted the student may earn up to one point towards the final grade. The bonus point will be relative to the quality of the student’s presentation and the responses given to the students’ (and my) queries. A student may earn up to 5 points toward the final grade. That is not a limit of 5 presentations but a limit of 5 points – meaning you can do more than 5 presentations to ensure you earn the 5 points. To obtain the bonus complete a report of the effort and submit in blackboard. The report should contain the initial Audio-Visual Post, the discussion, and the responses. No additional words are required but feel free to critique yourself.

Consistent and effective contributions of students to these discussion forums can have positive impact to their final grade (at least represented by the Participation activity).

Other

I will post questions for your use. These will include questions in lieu of homework and example questions that could be seen on an examination. You may submit the answers to obtain feedback and clarify your understanding of the material.

Course Schedule

<table>
<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Class</th>
<th>Lab Work</th>
<th>Assignments Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9/1</td>
<td>Course Introduction</td>
<td>1.0 (2:15)</td>
<td>Familiarize yourself with <a href="#">the course</a></td>
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<td></td>
<td></td>
<td>Lab Introduction</td>
<td></td>
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<td></td>
<td></td>
<td>Computer System Overview</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td>9/8</td>
<td>Librarian Visit</td>
<td>2.0 (4:40)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Operating System Overview</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td>9/15</td>
<td>Performance Measurements</td>
<td>3.0 (5:20)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>9/22</td>
<td>Input / Output Management</td>
<td>4.0, 5.1, 5.2 (4:15)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>9/29</td>
<td>File Managers</td>
<td>Rest of 5.0 (5:20)</td>
<td></td>
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<tr>
<td>6</td>
<td>10/6</td>
<td>Memory</td>
<td>6.1 → 6.5 (4:45)</td>
<td>Example Bibliography due (optional)</td>
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<td></td>
<td>10/13</td>
<td>Columbus Day Break</td>
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<tr>
<td>7</td>
<td>10/20</td>
<td>Memory Management</td>
<td></td>
<td>Practice Exam Objectives 1-5 (2:10)</td>
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<tr>
<td>8</td>
<td>10/27</td>
<td>Process Management</td>
<td>Rest of 6.0, 7.0 (4:25)</td>
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<td></td>
<td>Midterm (Lecture 2-7, Labs 1.0 – 5.0, Practice Exam)</td>
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<tr>
<td>9</td>
<td>11/3</td>
<td>Coordination</td>
<td>8.0 (5:55)</td>
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<td>10</td>
<td>11/10</td>
<td>Scheduling</td>
<td>9.0 (5:20)</td>
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<tr>
<td>11</td>
<td>11/17</td>
<td>Multiple Processors</td>
<td>10.0 (4:40)</td>
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<tr>
<td>12</td>
<td>11/24</td>
<td>User Interface</td>
<td>11.0 (3:25)</td>
<td></td>
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<tr>
<td>13</td>
<td>12/1</td>
<td>Security</td>
<td></td>
<td>Current Event due</td>
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<td></td>
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<td>Special Topics</td>
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<tr>
<td>14</td>
<td>12/8</td>
<td>Poster Session A</td>
<td></td>
<td>Client Pro Certification Exam (2:00)</td>
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<td></td>
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<td>Poster Session B</td>
<td></td>
<td>Poster and Notes due</td>
</tr>
<tr>
<td>12/15</td>
<td></td>
<td>Final Exam</td>
<td>7:30 – 10:15</td>
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An average student should expect to spend about 10 hours each week on this class. In class you will spend 3 ½ hours. There will be on average 4 hours per week on the lab. The remaining time will be read and study the material. Budget your time accordingly to complete the reading.

Class Format: Admin of about 10 minutes, Lecture, Break, Lecture, then Questions for about 15 minutes covering the class and lab.

Important Dates

Dates for adding, dropping the course, etc. are available at: http://registrar.gmu.edu

Religious Holidays and Sports

A list of religious holidays is available on the University Life Calendar page. Any student whose religious observance conflicts with a scheduled course activity must contact me at least 2 weeks in advance of the conflict in order to make alternative arrangements.

There are a large number of religious holidays that the university recognizes and many more that they may not be familiar with. Some of you may have obligations to one or more of Mason’s sports teams or to an employer as well. I will try to accommodate reasonable requests for conflicts of these types. It is your responsibility to bring it to my attention and to help craft a solution to the conflict.

Attendance Policy

Although attendance will not be recorded, it is assumed that you will attend every class. It is imperative that you do so as material can be presented not offered in the course notes. If you miss a class, you will miss important material. It is your responsibility to find out what happened in the class and obtain the information. I will respond to questions about the material but NOT about what was presented. It is your responsibility to find out what was covered. I recommend having one or more buddies in the class to share what was presented. Homework and/or reading assignments can be expected for most classes. Remember to put your name on your work. I encourage you to use the method of study you find best for yourself. I have found that active reading, outlining, and taking notes by hand continue to help me in my studies. You should take a lot of notes. The syllabus is a guide for the lectures and topics discussion. We may drift from it in a given week. Figure out how you will take the notes and organize them so you can keep track of the material. Discussion and participation can also enhance your overall understanding of the material (and as a side effect, your grade). The discussions are meant to be informative and helpful. It is not meant to be degrading or condescending. You must come to class prepared to participate in discussion of the lecture material and any handouts.

Cell phones and pagers must be turned off during the lecture. If your job precludes this please talk to me.

CELL PHONES, SMART PHONES, BLACKBERRIES, etc. Please turn off your communication devices during class. If it goes off, I will take it. You can have it after class. If you are an emergency responder or you have a possibly critical situation, please let me know.

Students are expected to complete any required preparatory work (including assigned reading) and to participate actively in lectures, discussions and exercises. All students are expected to contribute regardless of their proficiency with the subject matter.

Departmental policy requires students to take exams at the scheduled time and place, unless there are truly compelling, severe circumstances supported by appropriate documentation. Except in such circumstance, failure to arrive to the exam on time for a scheduled exam will result in a score of zero (0) for that exam, in accordance with Mason policy on final exams. Students should not make travel plans or other discretionary arrangement that conflict

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1 See Mortimer Adler and Charles Van Doren’s How to Read a Book
with scheduled classes or exams. If the University is closed due to weather or other unforeseen conditions, final exams may be rescheduled – students are strongly advised not to make plans that would prevent them from attending exams that may be rescheduled during the entire exam period.

If you text or even so much as look at your cell phone, email, text, etc. during an exam or a quiz, you will be asked to turn in your work in and it will not be graded. I prefer NOT to have laptops in the classroom except during lab or project time. They are a distraction rather than an aid in this sort of learning environment. If this is an issue with you then come speak with me.

**Classroom Conduct**

While students are encouraged to discuss solutions to problems, **students must submit their own, original, work.** All students are expected to abide by the [George Mason University Honor System and Code](http://mason.gmu.edu/~montecin/plagiarism.htm) (which contains a definition of plagiarism, amongst other things). Further related information is available from [IEEE](http://www.ieee.org/portal/pages/iportals/aboutus/ethics/code.html) and [ACM](http://www.acm.org/about/code-of-ethics). I reserve the right to submit student work for automated testing against other submitted work to confirm a submission’s originality.

I am very straightforward about how I deal with plagiarists. NO MERCY. I will fail you. I will ask for your expulsion. Do not find yourself in this situation.

I will be accepting work via Blackboard and in class this term depending on the assignment. Read the assignments carefully to understand how to submit them. Please be sure to put your name on the assignment even if submitted electronically. No name = no credit. For file names use the convention Last Name, First Name, Assignment – example is HoldenerJamesHW1. Spaces, dashes, and underscores are optional. If a particular assignment cannot be turned in via blackboard because of its format please contact me.

Students are expected to conduct themselves in a manner that is conducive to learning, as directed by the instructor. Any student who negatively impacts the opportunity for other students to learn will be warned – if disruptive behavior continues, the student will be removed from the course.

**Communications**

Registered students will be given access to a section of the [Blackboard Learning System](http://mason.gmu.edu) for this course. Blackboard will be used as the primary mechanism (outside of lectures) to disseminate course information, including announcements, lecture slides, assignments, and grades.

Communication with the instructor on issues relating to the individual student should be conducted using GMU email, telephone, or in person. Do not use a public forum for these communications. GMU Mail is the preferred method – for urgent messages, you should also attempt to contact myself via telephone. Federal privacy law and GMU policy require that any communication with a student related in any way to a student’s status be conducted using secure GMU systems – if you use email to communicate with the instructor you **MUST** send messages from your GMU email account.

All course material are published on Blackboard in Adobe Portable Document Format (PDF) or in a format for which a free reader is available. This allows users of most computing platforms to view and print these files. Microsoft Word (or a compatible word processing application) is required for preparing assignments – it is available on computers in the Mason open labs.

**Privacy**

Instructors respect and protect the privacy of information related to individual students. As describe above, issues relating to an individual student will be discussed via email, telephone, or in person. I will not discuss issues relating to an individual student with other students (or anyone without a need to know) without prior permission of the student.
Graded work other than exams will be returned to individual students directly by the instructor. Under no circumstances will a student’s graded work be returned to another student.

**Disability Accommodations**

The Office of Disability Services (ODS) works with disabled students to arrange for appropriate accommodations to ensure equal access to university services. Any student with a disability of any kind is strongly encouraged to register with ODS as soon as possible and take advantage of the services offered.

Accommodations for disabled students must be made in advance – ODS cannot assist students retroactively, and at least one week’s notice is required for special accommodations related to exams. Any student who needs accommodation should contact the instructor during the first week of the semester so the sufficient time is allowed to make arrangements.

**Honor Code**

All members of the Mason community are expected to uphold the principles of scholarly ethics. Similarly, graduating students are bound by the ethical requirements of the professional communities they join. On admission to Mason, students agree to comply with the requirements of the GMU Honor System and code (www.gmu.edu/catalog/apolicies). The Honor Code will be strictly enforced in this course. Honor Code cases are heard by a panel consisting of students – students who meet the requirements are encouraged to nominate themselves to serve on the Honor Committee. Any use of the words or ideas of another person, without explicit attribution that clearly identifies the material used and its source in an appropriate manner, is plagiarism and will not be tolerated. There is a mandated “zero tolerance” policy for plagiarism. I reserve the right to use all manual or automated means (including, but not limited to such services as Safe Assign and MOSS – Measure of Software Similarity) to detect plagiarism in any work submitted by students for this course. For this course, the following requirements are germane:

- All work that is to be submitted for a grade must be prepared by the individual student. Students are expressly prohibited from sharing any graded work for this course in any manner with anyone other than the instructor and teaching assistant assign to this course.
- All work must be newly created by the individual student for this course for this semester. Any usage of work developed for another course, or for this course in a prior semester, is strictly prohibited without prior approval from the instructor.
- Posting or sharing course content using any non-electronic or electronic medium constitutes copyright infringement and is strictly prohibited without prior approval from the instructor.

Students may, and are encouraged to, seek assistance from others for content assistance only that is not related to any graded work. Peer advisors may not assist a student with the completion of graded work.

**Campus Services:**

A number of services are available to students, and you are encouraged to make use of them as you may need:

**Writing Center**
A114 Robinson Hall; (703) 993-1200; http://writingcenter.gmu.edu

**Office of Disability Services:**
If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS. http://ods.gmu.edu and be arranged before any accommodation is needed.

**Counseling and Psychological Services (CAPS):**
(703) 993-2380; http://caps.gmu.edu
University Policy: The University Catalog, http://catalog.gmu.edu, is the central resource for university policies affecting student, faculty, and staff conduct in university academic affairs. Other policies are available at http://universitypolicy.gmu.edu/. All members of the university community are responsible for knowing and following established policies.