

605.204 Computer Organization - Summer 2017

Syllabus

Instructor Contact

Philip Snyder

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Philip Snyder prefers that students contact him via email. Please be sure to include course number in the subject line. Mr. Snyder will make every effort to respond to your inquiry within 24 hours. If an issue is urgent, the student is to indicate "urgent" within the subject line of the email and Mr. Snyder will respond as soon as is practical.

Office Hours via Adobe Connect

This course will use Adobe Connect to facilitate weekly, synchronous office hours chat session. Students are not required to participate in Office Hours, however, you may find them very beneficial for receiving more timely answers to questions related to the course content and assignments.

Office Hours will be scheduled on Mondays, and the time will be 8:30pm to 10:00pm Eastern US Time

The instructor will set up office hours links within the course discussion forum. Students will click on that link to access Adobe Connect and participate in the office hours. Students may post any questions they would like to have answered during the live office hour sessions to the "Office Hours Discussion" thread by noon the day before the scheduled discussion. Recorded office hour sessions will be posted to the Office Hours discussion forum for any students who were unable to participate in the "live" sessions or for students who like to view to them again.

For more information regarding Adobe Connect, please see the Adobe Connect Information page located in Help & Support.

Course Description

This course examines how a computer operates at the machine level. Students will develop an understanding of the hardware/software interface by studying the design and operation of computing system components. In addition, students will program at the assembly language level to understand internal system functionality. Finally, students will become familiar with the machine representations of programs and data as well as the influence of the underlying hardware system on the design of systems software such as operating systems, compilers, assemblers, and linkers and loaders.

Of the topics that are presented, some are given only at a high level which is to whet your appetite for more information which you will find in the later courses of your plan of study.

Prerequisites

This course does not have any prerequisites.

Course Goals

To identify and describe in detail the components of modern computer hardware and the way that the components are combined with the elements of system software to produce an efficient processing system.

Course Objectives

By the end of the course, students should be able to:

- Explain how computers operate at the machine level.
- Identify the various internal representations of instructions and data used by the MIPS computers.
- Summarize internal computer system functionality.
- Prepare MIPS assembly language programs that illuminate internal system functionality.
- Describe the design and operation of computing system software such as operating systems, compilers, assemblers, and linker loaders.
- Explain the influence of the underlying hardware system on the design of systems software.
- Discuss issues affecting modern system software.

Course Structure

The course content is divided into modules. Course Modules can be accessed by clicking Course Content on the left menu. A module will have several sections including the overview, content, readings, discussions, and assignments. Students are encouraged to preview all sections of the module before starting. Most modules run for a period of seven (7) days, exceptions are noted on the Course Outline page. Students should regularly check the Calendar and Announcements for assignment due dates.

Textbook

Required

Patterson, D. A., Hennessy, J. L. (2014). *Computer Organization and Design*. (Rev. 5th ed.), Waltham, MA: Morgan Kaufmann

ISBN-13: 978-0-12-407726-3

Textbook information for this course is available online through the appropriate bookstore website: For online courses, search the MBS website at <http://ep.jhu.edu/bookstore>.

This is the MIPS edition of the textbook. Other editions exist and may not be used.

Required Software

SPIM Simulator

You will need access to a recent version of the SPIM simulator (QtSPIM). Students can access the software from the web site referenced in the textbook. The simulator assembles and executes programs written in the MIPS assembly language.

Technical Requirements

Students should refer to Help & Support for a general listing of all the course technical requirements.

Student Coursework Requirements

It is expected that each class will take approximately 5–8 hours per week to complete. Here is an approximate breakdown: reading the assigned sections of the texts (approximately 2–3 hours per week) as well as some outside reading, listening to the audio annotated slide presentations (approximately 1–2 hours per week), and writing assignments (approximately 2–3 hours per week).

This course will consist of four basic student requirements:

1. **Preparation and Participation (Class Discussions)** (15% of Final Grade Calculation)

Each student is responsible for carefully reading all assigned material and being prepared for discussion. The majority of readings are from the course text. Additional reading may be assigned to supplement text readings.

The module discussion questions will be available on Wednesday (Day 1). Students must post a response to the question no later than Saturday (Day 4). At least one response to another student's post is required by Tuesday (Day 7). Posting at least one response to the each of the discussion questions and one response to the follow-up discussion is part one of your grade for class discussions (i.e., Timeliness).

Four fifths of the Discussion grade is based on your first participation due Saturday evenings. The remaining fifth is based on your response to the other students due Tuesdays.

Discussion questions will not be posted every week, and there will be no discussion questions assigned during programming project modules, nor the final exam module.

Part two of your grade for class discussion is your interaction (i.e., responding to classmate postings with thoughtful responses) with at least one classmate (i.e., Critical Thinking). Just posting your response to a discussion question is not sufficient; I want you to interact with your classmates. Be detailed in your postings and in your responses to your classmates' postings. Feel free to agree or disagree with your classmates. Please ensure that your postings are civil and constructive.

Philip Snyder will monitor class discussions and will respond to some of the discussions as discussions are posted. In some instances, Mr. Snyder will summarize the overall discussions and post the summary for the class.

Evaluation of preparation and participation is based on contribution to discussions.

Preparation and participation is evaluated by the following grading elements:

1. Timeliness (25%)
2. Critical Thinking (75%)

Preparation and participation is graded as follows:

100–90 = A—Timeliness [regularly participates; all required postings; early in discussion; throughout the discussion]; Critical Thinking [rich in content; full of thoughts, insight, and analysis].

89–80 = B—Timeliness [frequently participates; all required postings; some not in time for others to read and respond]; Critical Thinking [substantial information; thought, insight, and analysis has taken place].

79–70 = C—Timeliness [infrequently participates; all required postings; most at the last minute without allowing for response time]; Critical Thinking [generally competent; information is thin and commonplace].

<70 = F—Timeliness [rarely participates; some, or all required postings missing]; Critical Thinking [rudimentary and superficial; no analysis or insight is displayed].

2. **Assignments** (35% of Final Grade Calculation)

In preparing your written assignments, please put the class assignment number and your name on each assignment, even though it will also be submitted electronically. The question need not be repeated before answering. The purpose of the assignment is to give the students the opportunity to demonstrate and apply their understanding of the course concepts.

All assignments are due according to the dates in the Calendar.

Late submissions will be reduced by 5 % of the grade point total for each week late (exceptions only by coordination with the instructor).

If, after submitting a written assignment a student is not satisfied with the grade received, the student is encouraged to redo the assignment and resubmit it. If the resubmission results in a better grade, that grade will be substituted for the previous grade. Please note: Just repeating the instructor's provided solution, will not improve the grade.

Qualitative assignments are evaluated by the following grading elements:

1. Each part of question is answered (10%)
2. Writing quality and technical accuracy (65%) (Writing is expected to meet or exceed accepted graduate-level English and scholarship standards. That is, all assignments will be graded on grammar and style as well as content.)
3. Rationale for answer is provided (20%)

4. Examples are included to illustrate rationale (5%) (If a student does not have direct experience related to a particular question, then the student is to provide analogies versus examples.)

Qualitative Assignments are graded as follows:

100–90 = A—All parts of question are addressed; Writing Quality/ Rationale/ Examples/ Outside References [rich in content; full of thought, insight, and analysis].

89–80 = B—All parts of the question are addressed; Writing Quality/ Rationale/ Examples/ Outside References [substantial information; thought, insight, and analysis has taken place].

79–70=C—Majority of parts of the question are addressed; Writing Quality/ Rationale/ Examples/ Outside References [generally competent; information is thin and commonplace].

<70=F—Some parts of the question are addressed; Writing Quality/ Rationale/ Examples/ Outside References [rudimentary and superficial; no analysis or insight displayed].

Quantitative assignments are evaluated by the following grading elements:

1. Each part of question is answered (10%)
2. Assumptions are clearly stated (5%)
3. Intermediate derivations and calculations are provided (15%)
4. Answer is technically correct and is clearly indicated (65%)
5. Answer precision and units are appropriate (5%)

Quantitative Assignments are graded as follows:

100–90 = A—All parts of question are addressed; All assumptions are clearly stated; All intermediate derivations and calculations are provided; Answer is technically correct and is clearly indicated; Answer precision and units are appropriate.

89–80 = B—All parts of question are addressed; All assumptions are clearly stated; Some intermediate derivations and calculations are provided; Answer is technically correct and is indicated; Answer precision and units are appropriate.

79–70=C—Most parts of question are addressed; Assumptions are partially stated; Few intermediate derivations and calculations are provided; Answer is not technically correct but is indicated; Answer precision and units are indicated but inappropriate.

<70=F—Some parts of the question are addressed; Assumptions are not stated; Intermediate derivations and calculations are not provided; The answer is incorrect or missing; The answer precision and units are inappropriate or missing.

3. **Class (Individual) Projects** (30% of Final Grade Calculation)

Three programming projects will be assigned several weeks into the course.

The programming project is evaluated by the following grading elements:

1. The completed program produces the correct expected result as described in the Programming Project Requirements document. (90%)

2. Quality of the completed program in terms of readability, maintainability, and style as described in the Programming Project Requirements document. (10%)

Late submissions will be reduced by 5 % of the grade point total for each week late

Projects are graded as follows:

100–90 = A—All parts of question are addressed; All assumptions are clearly stated; All intermediate derivations and calculations are provided; Answer is technically correct and is clearly indicated; Answer precision and units are appropriate.

89–80 = B—All parts of question are addressed; All assumptions are clearly stated; Some intermediate derivations and calculations are provided; Answer is technically correct and is indicated; Answer precision and units are appropriate.

79–70 = C—Most parts of question are addressed; Assumptions are partially stated; Few intermediate derivations and calculations are provided; Answer is not technically correct but is indicated; Answer precision and units are indicated but inappropriate.

<70 = F—Some parts of the question are addressed; Assumptions are not stated; Intermediate derivations and calculations are not provided; The answer is incorrect or missing; The answer precision and units are inappropriate or missing.

4. **Final Exam** (20% of Final Grade Calculation)

The final exam will be available in the last week. Students will have six days to complete the exams and they will be due by 11PM exactly six days from their release. Late submissions will not be accepted. Students may use the course text to complete the exams.

The exams are evaluated by the following grading elements:

1. Each part of question is answered (10%)
2. Writing quality and technical accuracy (70%) (Writing is expected to meet or exceed accepted graduate-level English and scholarship standards. That is, all assignments will be graded on grammar and style as well as content.)
3. Rationale for answer is provided (15%)
4. Examples are included to illustrate rationale (5%) (If a student does not have direct experience related to a particular question, then the student is to provide analogies versus examples.)

Exams are graded as follows:

100–90 = A—All parts of question are addressed; Writing Quality/ Rationale/ Examples/ Outside References [rich in content; full of thought, insight, and analysis].

89–80 = B—All parts of the question are addressed; Writing Quality/ Rationale/ Examples/ Outside References [substantial information; thought, insight, and analysis has taken place].

79–70 = C—Majority of parts of the question are addressed; Writing Quality/ Rationale/ Examples/ Outside References [generally competent; information is thin and commonplace].

<70 = F—Some parts of the question are addressed; Writing Quality/ Rationale/ Examples/ Outside References [rudimentary and superficial; no analysis or insight displayed].

Grading

Student assignments are due according to the dates in the Calendar. Philip Snyder will post grades within one week after assignment due dates, or sooner as practical.

I generally do not directly grade spelling and grammar. However, egregious violations of the rules of the English language will be noted. Consistently poor performance in either spelling or grammar is taken as an indication of poor written communication ability that may detract from your grade.

A grade of A indicates achievement of consistent excellence and distinction throughout the course—that is, conspicuous excellence in all aspects of assignments and discussion in every week.

A grade of B indicates work that meets all course requirements on a level appropriate for graduate academic work. These criteria apply to both undergraduates and graduate students taking the course.

JHU-EP uses a +/- grading system. Final grades are based on the following scale

Letter Grade	Final Average
A+	100-98
A	97-94
A-	93-90
B+	89-87
B	86-83
B-	82-80
C	79-70
F	< 70

Final grades will be determined by the following weighting:

Item	% of Grade
Preparation and Participation (Class Discussions)	15%
Assignments	35%
Programming Projects	30%
Final Exam	20%

Support Resources

Students should refer to Help & Support on the left menu for a listing of all the student services and support available to them.

Policies and Guidelines

The classes are designed to be highly interactive where questions and discussion on the material is encouraged. There is also a required online discussion portion as described above.

Collaborations and discussions between students are key ingredients to success in a graduate course. You are encouraged to discuss the course material with each other as you sort through concepts that may be difficult to comprehend or controversial.

However, the line between collaboration and cheating needs to be carefully delineated. Whenever you turn in work with your name on it to be evaluated, graded and included in your record it must represent an individual effort by you alone. If you include direct quotes from any source in your discussions, written assignments, the final exam, or any other submission for which you will receive a grade you must provide attribution. Students using published material without reference, or copying the work of another individual will receive a warning at the first incident. Any further incidents will result in the student receiving a zero on the assignment and the matter will be referred to the Associate Dean. Contact us if you have any questions, no matter how slight, about this policy, or if you have questions about a particular assignment.

Academic Integrity

Academic Misconduct Policy

All students are required to read, know, and comply with the Johns Hopkins University Krieger School of Arts and Sciences (KSAS) / Whiting School of Engineering (WSE) Procedures for Handling Allegations of Misconduct by Full-Time and Part-Time Graduate Students available at: <https://ep.jhu.edu/wseacademicmisconductpolicy>

This policy prohibits academic misconduct, including but not limited to the following: cheating or facilitating cheating; plagiarism; reuse of assignments; unauthorized collaboration; alteration of graded assignments; and unfair competition. You may request a paper copy of this policy by contacting Mark Tuminello

Phone 410-516-2306

E-mail mtumine2@jhu.edu 

Policy on Disability Services

Johns Hopkins University (JHU) is committed to creating a welcoming and inclusive environment for students, faculty, staff and visitors with disabilities. The University does not discriminate on the basis of race, color, sex, religion, sexual orientation, national or ethnic origin, age, disability or veteran status in any student program or activity, or with regard to admission or employment. JHU works to ensure that students, employees and visitors with disabilities have equal access to university programs, facilities, technology and websites.

Under Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act (ADA) of 1990 and the ADA Amendments Act of 2008, a person is considered to have a disability if c (1) he or she has a physical or mental impairment that substantially limits one or more major life activities (such as hearing, seeing, speaking, breathing, performing manual tasks, walking, caring for oneself, learning, or concentrating); (2) has a record of having such an impairment; or (3) is regarded as having such an impairment class. The University provides reasonable and appropriate accommodations to students and employees with disabilities. In most cases, JHU will require documentation of the disability and the need for the specific requested accommodation.

The Disability Services program within the Office of Institutional Equity oversees the coordination of reasonable accommodations for students and employees with disabilities, and serves as the central point of contact for information on physical and programmatic access at the University. More information on this policy may be found at <http://web.jhu.edu/administration/jhuoie/disability/index.html> or by contacting (410) 516-8075.

Disability Services

Johns Hopkins Engineering for Professionals is committed to providing reasonable and appropriate accommodations to students with disabilities.

Students requiring accommodations are encouraged to contact Disability Services at least four weeks before the start of the academic term or as soon as possible. Although requests can be made at any time, students should understand that there may be a delay of up to two weeks for implementation depending on the nature of the accommodations requested.

Requesting Accommodation

New students must submit a [Student Request for Accommodation](#) form along with supporting documentation from a qualified diagnostician that:

- Identifies the type of disability
- Describes the current level of functioning in an academic setting
- Lists recommended accommodations

Questions about disability resources and requests for accommodation at Johns Hopkins Engineering for Professionals should be directed to:

Mark Tuminello

Disability Services Coordinator

Phone 410-516-2306

Fax 410-579-8049

E-mail mtumine2@jhu.edu or ep-disability-svcs@jhu.edu

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