INSTRUCTOR – Radhouane Chouchane (Radwan Shushane)
EMAIL – chouchane_radhouane@columbusstate.edu (best way to reach me!)
HOMEPAGE: http://csc.columbusstate.edu/chouchane/
PHONE
Office phone: (706) 507-8175
School phone: (706) 507-8170
OFFICE HOURS AND LOCATION TWR 12:30-4:00pm; Other. Must use e-mail to schedule an appointment / CCT 430
MEETING TIME AND PLACE (This is an online course, taught through CougarVIEW. Go to http://colstate.view.usg.edu to access course material, complete assignments, take exams, and view announcements.)

COURSE INFORMATION

COURSE CRN NUMBER/TITLE CPSC 6142 – System Simulation (CRN 22353)
CREDIT HOURS/PREREQUISITES (3 credits). CPSC 6107 with a grade of "B" or better.

Course Description: System simulation is a problem solving interdisciplinary methodology for analysis and optimization of real systems or planned systems using computer models. The main course topics include input analysis, system model validation and verification, output analysis, and modeling of variety of systems. Simulation software for developing and analysis of computer simulation models will be introduced. Simulation models of real systems in manufacturing, logistics, communication, transportation, military, and health area will be studied.

REQUIRED TEXTBOOK AND MATERIALS


Arena. Available at https://www.arenasimulation.com/academic/students

SUPPLEMENTARY BOOKS AND MATERIALS

Materials available on the course web site through CougarVIEW
Cougarview materials (https://colstate.view.usg.edu/)

Links to Online resources on writing secure software - https://msdn.microsoft.com/en-us/library/ms182020(v=vs.100).aspx
Software and manuals found in the computer labs and on the Internet

LEARNING OUTCOMES

Course Objective: Upon completion of this course, students will be able to
Contrast systems and models by defining systems, models, simulation, simulators, and systems modeling
Simulate discrete events using different types of queueing and simulation models, as well as methods for capturing time and events. Additional System Modeling Techniques: UML and SysML
Analyze systems by combining the outcomes of Input Analysis, Output Analyses, and Correlation Analysis
Use standards and accepted practices to verify and validate models

Course Outcomes:
The students will be able to analyze and develop system models
- Strategies and Actions used to produce the outcome:
  - Use UML and SysML
  - Input, Output, Correlation Analysis
- ABET Criteria covered: A, B, C, and K
- Program Objectives covered: 2 and 3
- Assessment Methods: Lab Assignments and Exams.
The students will be able to simulate discrete events
- Strategies and Actions used to produce the outcome:
  - Simulate time and event
  - Stochastic processes
- ABET Criteria covered: A, B, C, and K
- Program Objectives covered: 2 and 3
- Assessment Methods: Lab Assignments and Exams.
The students will be able to verify and validate models
- Strategies and Actions used to produce the outcome:
  - Discrete and continuous distributions
  - Apply results and theorems from probability and statistics to the domain of system simulation
- ABET Criteria covered: A, B, C, and K
- Program Objectives covered: 2 and 3
- Assessment Methods: Lab Assignments and Exams.

COURSE ASSESSMENT

LEARNING ACTIVITIES

1. This course will be taught online. See http://online.columbusstate.edu/ for general information on taking an online course at CSU. I expect students to come prepared to class and maintain a well-organized record of their own notes. At the very least, students should have read the chapter upon which the current lecture is based. Participation in class is crucial and is part of the student’s final grade. Students should immediately approach the instructor with any clarification questions they may have.

2. Students are expected to take part in threaded discussions.

3. All students must have access to a networked computer to complete their assignments and regularly visit the course website for new assignments, reading materials and announcements.

4. Students will experiments with a number of software packages to reinforce their understanding of the material.
5. The ACM recommends the following: “As a general guideline, the amount of out-of-class work is approximately three times the in-class time. Thus, a unit that is listed as requiring 3 hours typically entails a total of 12 hours (3 in class and 9 outside).” Students will be expected to spend this time outside class reading the book, online materials and other materials; writing solutions to homework exercises and programming projects.

COURSE EVALUATION

<table>
<thead>
<tr>
<th>GRADED LEARNING ACTIVITIES</th>
<th>Percentage</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming Assignments – due on their respective due days <strong>before</strong> 11:59pm</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>For each assignment, students may be expected to solve problems with the help of an existing software package (such as <a href="https://www.arenasimulation.com/academic/students">https://www.arenasimulation.com/academic/students</a>). Assignments will focus on one or more of the learning objectives. Homework assignments are to be submitted via CougarVIEW. Assignments will normally be graded and returned within 7 days of their due date. Unless untimely submission of an assignment is due to a documented emergency reported to the instructor before the day on which the assignment is due, a penalty of 5% per day will be incurred for late assignments. Assignments submitted more than 3 days after their due date will be considered missed and will receive a grade of 0.</td>
<td>35</td>
<td></td>
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<tr>
<td>Midterm Test</td>
<td>20</td>
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<tr>
<td>The midterm will be open-books, open-notes. The midterm will require us to use the Arena software to help us solve simulation problems. I may also include multiple choice questions. Missed midterms will NOT be made up unless due to a documented emergency (like a doctor’s appointment).</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Comprehensive FINAL EXAM</td>
<td>35</td>
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<tr>
<td>The final will be timed, open-books, open-notes. The final will require us to use the Arena software to help us solve simulation problems. I may also include multiple choice questions. Missed finals will NOT be made up unless due to a documented emergency (like a doctor’s appointment).</td>
<td>35</td>
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</tr>
<tr>
<td>Discussions Every two weeks or so, a discussion topic will be posted by the instructor. A minimum of two high-quality timely contributions to the online discussion group will be required for each discussion topic. A high-quality, timely contribution to the online discussion group is one that addresses one of the issues raised by the discussion topic, or one raised by another student during the time period for the topic. Contributions such as “I agree” are not considered high-quality and will not get credit. Students are expected to interact in a professional and courteous manner. No non-topic-related issues are to be brought up on the board. No vulgarities, personal attacks, or offensive language of any sort will be allowed.</td>
<td>10</td>
<td></td>
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<tr>
<td>TOTAL</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Percentage Range</td>
<td>Final Grade</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
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<td>-------------</td>
</tr>
<tr>
<td>90-100%</td>
<td>A</td>
<td>fulfills or exceeds all of the assigned content requirements. Knowledge of the subject is accurate throughout. Exhibits convincing range and quality of knowledge, having done appropriate research, if applicable.</td>
</tr>
<tr>
<td>80-89%</td>
<td>B</td>
<td>fulfills all of the important assigned content requirements. Knowledge of the subject is accurate throughout except in minor details. Seems informed on the subject, having done appropriate research, if applicable.</td>
</tr>
<tr>
<td>70-79%</td>
<td>C</td>
<td>fulfills most of the important assigned content requirements. Knowledge of the subject is generally accurate, though flawed. Exhibits limited range or quality of knowledge, having done limited appropriate research, if applicable.</td>
</tr>
<tr>
<td>60-69%</td>
<td>D</td>
<td>fulfills some of the important assigned content requirements. Knowledge of the subject is generally accurate, though flawed. Exhibits limited range or quality of knowledge, having done minimal appropriate research, if applicable.</td>
</tr>
<tr>
<td>59% and below</td>
<td>F</td>
<td>fails to address the important requirements of the course. Knowledge of the subject is generally inaccurate and/or lacks range or quality.</td>
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</table>

**ADMINISTRATIVE POLICIES AND ACADEMIC RESOURCES**

**ADA AND 504 STATEMENT**

If you have a documented disability as described by the Americans with Disabilities Act (ADA) and the Rehabilitation Act of 1973, Section 504, you may be eligible to receive accommodations to assist in programmatic and/or physical accessibility. We recommend that you contact the Center for Accommodation and Access located in Schuster Student Success Center, Room 221, 706-507-8755 as soon as possible. The Center for Accommodation and Access can assist you in formulating a reasonable accommodation plan and in providing support. Course requirements will not be waived but accommodations may be able to assist you to meet the requirements. Technical support may also be available to meet your specific need.

**ACADEMIC INTEGRITY**

All students are expected to recognize and uphold standards of intellectual and academic integrity. 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 comply with the provisions of Section III, "Student Responsibilities," of the Columbus State University Student Handbook. This specifically includes the sections on "Academic Irregularity," and "Conduct Irregularity." In particular, the Columbus State University Student Handbook states:
“No student shall give or receive assistance in the preparation of any assignment, essay, laboratory report, or examination to be submitted as a requirement for any academic course in such a way that the submitted work can no longer be considered the personal effort of the student submitting the work.”

Examples of Academic Dishonesty include but are not limited to: Plagiarism (see definition below), giving or receiving unauthorized assistance on exams, quizzes, class assignments or projects, unauthorized collaboration, multiple submissions (in whole or part) of work that has been previously submitted for credit.

Plagiarism is any attempt to represent the work or ideas of someone else as your own. This includes purchasing or obtaining papers from any person and turning them in as your own. It also includes the use of paraphrases or quotes from a published source without properly citing the source. All written assignments may be submitted for textual similarity review to Turnitin.com for the detection of plagiarism.

Any work turned in for individual credit must be entirely the work of the student submitting the work. All work must be your own. You may share ideas but submitting identical assignments (for example) will be considered cheating. You may discuss the material in the course and help one another with debugging, however, I expect any work you hand in for a grade to be your own. A simple way to avoid inadvertent plagiarism is to talk about the assignments, but don’t read each other’s work or write solutions together. Keep scratch paper and old versions of assignments until after the assignment has been graded and returned to you. If you have any questions about this, please see me immediately.

For assignments, access to notes, textbook, books and other publications is allowed. Stealing, giving or receiving any code, diagrams, drawings, text or designs from another person (CSU or non-CSU) is not allowed. Having access to another person’s work on the system or giving access to your work to another person is not allowed. It is your responsibility to keep your work confidential.

No cheating in any form will be tolerated. Please be aware that anyone caught cheating or plagiarizing in this class will receive a “0” for the assignment/exam and may receive an F for the course.

STUDENT COMPLAINT PROCESS

Information and resources for student complaints and academic appeals are located at the following link on the Columbus State University website http://aa.columbusstate.edu/appeals/.

COURSE ATTENDANCE POLICY

Class attendance is the responsibility of the student, and it is the student’s responsibility to independently cover any materials missed. Class attendance and participation will be used in determining grades. At my discretion, I may drop you from the course for more than two (2) consecutive absences (i.e., no logins to the class’ CougarVIEW website for more than two weeks). Missed days on the class’ CougarVIEW website caused by participation in documented, formal, University-sponsored events will not count as absences provided you notify me of such anticipated absences in advance and as soon as possible.

You are responsible for all class work missed, regardless of the reason for the absence(s). Late assignments will be graded as described in the Graded Learning Activities section. If you are absent on the day an exam is due, it is your responsibility to make alternate arrangements. No makeup exams will be given, unless due to a documented emergency (like a doctor’s appointment) so please make sure to complete all of your tests on time. Refer to the CSU Catalog (https://academics.columbusstate.edu/catalogs/current/militaryandveteransbenefits/attendancewithdrawal.php ) for more information on class attendance and withdrawal.
Electronic Devices and Academic Integrity: All cell phones and pagers must be turned off prior to entering the classroom or lab. The use of any electronic device during a proctored test or quiz is prohibited. This includes cell phones, handheld calculators, iPhones, Android phones, PalmPilots, Blackberrys, PocketPCs, and laptops. Any use of such a device during a proctored test or quiz will be considered a breach of academic integrity.

TECHNICAL RESOURCES
HARDWARE REQUIREMENTS
How do I know if my computer will work with D2L?

SOFTWARE REQUIREMENTS
An office suite such as Microsoft Office or Open Office
To open PDF files you might need Acrobat Reader
Browser Plugins (Pdf files, QuickTime files, Mp4 files) can be usually be obtained at the browsers website.
Google Chrome
Firefox
Safari
Internet Explorer (Caution: IE is often problematic for D2L-CougarVIEW)

If you need technical support or need assistance configuring your computer, you can refer to the link located in the "Support Resources" widget located on your "My Home" and your "Course Home" pages. If you cannot solve your problem after reviewing the knowledge base help pages, you can call help center 24-7 and talk to a Help Center agent. The number is 1-855-772-0423.

Course Material Downloads
Available in CougarVIEW.

OTHER
How to Access the Course
You can access the course through CougarView at: http://colstate.view.usg.edu/
At this page, select the "Log on to" CougarView link to activate the CougarView logon dialog box, which will ask for your CougarView username and password. Your CougarView username and password are the same as your Cougarnet username and password:
Username: lastname_firstname
Password: XXXX
Default password is your birthday in the format of DDMMYY.
If you try the above and CougarView will not let you in, please use the "Comments/Problems" link on the CougarView home page to request help. If you are still having problems gaining access a day or so after the class begins, please e-mail me immediately.

Once you've entered CougarView, you will see a list of courses you have access to. The CPSC 6142 course is listed as "System Simulation". You may also see new calendar postings, and new mail messages. Clicking on the name of the course will take you to the course's home page. If you do not see the "System Simulation" course in the list, please e-mail me immediately.
Once you have clicked on the course's name and accessed the particular course itself, you will find a home page with links to other sections and tools, and a menu on the left-hand side. Feel free to explore the areas in the course.

**Course Website**

It is your responsibility to frequently look at the course’s CougarVIEW website to keep your knowledge of class activities current. I may occasionally forget to announce details in class, but they may have already been posted in CougarView. If so, you will still be held responsible for them. For example, assignment due dates, corrections of errors, announcements, exam dates, changes to policies, and so on. Students are responsible for keeping pace with the progress of the course. Should any concerns about the course’s contents be addressed, students should immediately consult with the instructor by email or during office hours. In addition to regularly reading from the text book, students must visit the course’s website at least once a day for recent updates and announcements. Students must regularly check both their CSU and their CougarVIEW email accounts for messages from the instructor. Announcements made on CougarVIEW, and that are at least 24 hours old, will be assumed to have been read by their recipient(s).

“I didn’t know” is not excuse for not submitting an assignment in time or for not having read an email/announcement from the instructor.

**Getting help**

Student assistants in the public Computer Center labs / Library can help you with basic computer-related problems such as logging on to the network, saving your work, etc., but they are not obligated to help you with your assignments. There are several tutors in the School of Computer Science lab (CCT450) who can help you with the assignments. Their schedule is posted in the Computer Science School. You can always contact me by e-mail, or by appointment, to discuss class material. Email is always the best, fastest way to reach me.

**Student Responsibilities**

As a student in this course, you are responsible to:

- manage your time and maintain the discipline required to meet the course requirements,
- complete all readings,
- complete all assignments,
- complete all exams, and
- read any e-mail sent by the instructor and respond accordingly.

**Instructor Responsibilities**

As your instructor in this course, I am responsible to:

- lead the class discussion and answer students’ questions,
- actively participate in discussions when necessary,
- respond to students questions and concerns,
- grade assignments and exams, and post scores within one week of the end of the week in which they are submitted, and
- read any e-mail sent by you and respond accordingly within 24 hours.
**Student Portfolio**

Students are encouraged to keep and maintain a portfolio of all of their work (assignments, projects, etc.) throughout their academic program. It is recommended that you keep a copy on your personal H: drive at CSU and back it up regularly on your own portable media or in the cloud.

**Course Schedule**

<table>
<thead>
<tr>
<th>WEEK</th>
<th>DATE</th>
<th>TOPIC</th>
<th>READING/ASSIGNMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan. 22-26</td>
<td>What is Simulation</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Jan29-Feb.2</td>
<td>Fundamental Simulation Concepts</td>
<td></td>
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<tr>
<td>3</td>
<td>Feb. 5 -9</td>
<td>A Guided Tour Through Arena</td>
<td></td>
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<tr>
<td>4</td>
<td>Feb. 12 -16</td>
<td>Modeling Basic Operations and Input</td>
<td>Lab1 (Tentative)</td>
</tr>
<tr>
<td>5</td>
<td>Feb. 19 -23</td>
<td>Modeling Detailed Operations</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Feb26-Mar2</td>
<td>Statistical Analysis of Output from Terminating Simulations</td>
<td>Lab2 (Tentative)</td>
</tr>
<tr>
<td>7</td>
<td>Mar. 5-9</td>
<td>Review for Midterm</td>
<td>Midterm (TBA)</td>
</tr>
<tr>
<td>8</td>
<td>Mar. 12-16</td>
<td>Intermediate Modeling and Steady-State Analysis</td>
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<tr>
<td>9</td>
<td>Mar. 19-23</td>
<td>Spring Break. No classes.</td>
<td></td>
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<tr>
<td>10</td>
<td>Mar. 26-30</td>
<td>Entity Transfer</td>
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<tr>
<td>11</td>
<td>Apr. 2-6</td>
<td>Verification and Validation</td>
<td>Lab3 (Tentative)</td>
</tr>
<tr>
<td>12</td>
<td>Apr. 9-13</td>
<td>Arena Integration and Customization</td>
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<tr>
<td>13</td>
<td>Apr. 16-20</td>
<td>Continuous and Combined</td>
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<tr>
<td>14</td>
<td>Apr. 23-27</td>
<td>Further Statistical Studies</td>
<td>Lab4 (Tentative)</td>
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<tr>
<td>15</td>
<td>Apr30-May 4</td>
<td>Supplement Topics B and C</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Jan. 22-26</td>
<td>Review for Final Exam</td>
<td>Final Exam (TBA)</td>
</tr>
</tbody>
</table>

**ABET Criteria:**

**Students in CS/IT will have a(n)**

A. ability to apply knowledge of computing and mathematics appropriate to the discipline;
B. ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;
C. ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs;
D. ability to function effectively on teams to accomplish a common goal;
E. understanding of professional, ethical, legal, security, and social issues and responsibilities;
F. ability to communicate effectively with a range of audiences;
G. ability to analyze the local and global impact of computing on individuals, organizations and society;
H. recognition of the need for, and an ability to engage in, continuing professional development;
I. ability to use current techniques, skills, and tools necessary for computing practice.
J. ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;
K. ability to apply design and development principles in the construction of software systems of varying complexity.

**CS Program Objectives:**

Our graduates will have achieved:

1) A broad general education assuring an adequate foundation in science and mathematics relevant to computing.
2) A solid understanding of concepts fundamental to the discipline of computer science.
3) Good analytic, design, and implementation skills required to formulate and solve computing problems.
4) The ability to function and communicate effectively as ethically and socially responsible computer science professionals.
ACM Code of Ethics and Professional Conduct

THE CODE represents ACM’s commitment to promoting the highest professional and ethical standards, and makes it incumbent on all ACM Members to:

- Contribute to society and human well-being.
- Avoid harm to others.
- Be honest and trustworthy.
- Be fair and take action not to discriminate.
- Honor property rights including copyrights and patent.
- Give proper credit for intellectual property.
- Respect the privacy of others.
- Honor confidentiality.

And as computing professionals, every ACM Member is also expected to:

- Strive to achieve the highest quality, effectiveness and dignity in both the process and products of professional work.
- Acquire and maintain professional competence.
- Know and respect existing laws pertaining to professional work.
- Accept and provide appropriate professional review.
- Give comprehensive and thorough evaluations of computer systems and their impacts, including analysis of possible risks.
- Honor contracts, agreements, and assigned responsibilities.
- Improve public understanding of computing and its consequences.
- Access computing and communication resources only when authorized to do so.

This flyer shows an abridged version of the ACM Code of Ethics. The complete version can be viewed at: www.acm.org/constitution/code.