Central Connecticut State University  
Department of Mathematical Sciences  

STAT 476/576 Biostatistics Spring 2021  
Section 02 ONLINE  

PREREQUISITE  
STAT 201 or STAT 216, or equivalent (C- or higher).  

CATALOG DESCRIPTION  
Introduction to statistical models applied in the health sciences, with a focus on the estimation and interpretation of odds ratios, risk ratios and hazard ratios. Topics may include contingency tables, binary and ordinal logistic regression, Poisson regression, log-binomial regression, generalized linear models, survival analysis, cox proportional hazards and failure time models; use of computer software such as R.  

COURSE DESCRIPTION  
This is for students who are interested in how statistical analyses can be used to answer research questions in health sciences. Our focus will be on some of the most widely used statistical methods that are available, how to mathematically represent the phenomenon we are interested in studying, and how data analysis can be used to answer some of our questions.  

GOALS  
One of the primary goals in this course is to get you familiar with how to interpret and conduct quantitative research. We will introduce comparative measures such as odds ratios, risk ratios, and hazard ratios and methods to estimate them. Other topics may be added based on student interest and background. This course can help prepare you to conduct your own quantitative research, and to become better prepared to understand research done by others.  

INSTRUCTOR  
Dr. Gurbakhshash Singh  
Office: Marcus White 107 (MW107)  
Phone: (860) 832-2834  
E-mail: gsingh@ccsu.edu  
My office hours for the Spring 2021 semester are:  
Monday 10:00am-11:00am & 3:00pm – 4:00pm (WebEx)  
Tuesday/Thursday 1:00pm – 3:00pm (WebEx)
RECOMMENDED TEXT


Note – additional materials will be available.

**GRADES**

Grades will be based strictly on the following criteria:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Two Examinations</td>
<td>20%</td>
</tr>
<tr>
<td>Homework Assignments</td>
<td>40%</td>
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<tr>
<td>Final Project</td>
<td>20%</td>
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The letter Grades are determined as follows:

- **A** 93+
- **A–** 90 – 92
- **B+** 87 – 89
- **B** 83 – 86
- **B–** 80 – 82
- **C+** 77 – 79
- **C** 73 – 76
- **C–** 70 – 72
- **D+** 67 – 69
- **D** 63 – 66
- **D–** 60 – 62
- **F** 0 – 59

In order to be fair to all students, extra-credit work will not be accepted at any time for any reason. **As a general course policy there are no make-ups allowed for missed or late work (this also includes what some refer to as “excused” absences).**

Lecture videos will be available weekly on Tuesday and Thursday after 1:00pm on Blackboard in the “Lecture Videos” tab. The videos contain lecture content on Biostatistics and tutorials on R/RStudio. The videos are available throughout the semester.

Homework assignment will be given regularly on Blackboard in the “Homework Assignment” tab. You must submit prior to the deadline listed. All homework and exams are open book and open notes. Assistance is not allowed on any exams or homework. Anyone violating this will face academic misconduct procedures. If you miss a submission deadline, you will receive the grade of 0 for that assignment or exam.

The Final Project is an open exploration by the student to either implement methods discussed or methods that build from course material. Students will write a short research proposal in April and will complete the project by May.

If you are a student with a documented disability, and would like to request academic accommodations, you are encouraged to contact Student Disability Services (SDS) at 860-832-1952, or email: disabilityservices@ccsu.edu. Please visit the SDS Website at [http://www.ccsu.edu/sds/](http://www.ccsu.edu/sds/) to download an Intake form and documentation requirements. Once approved, SDS suggests that students discuss their approved accommodations with their professors, as well as any other additional medical emergency needs. Temporary impairments may also qualify for accommodations. Please note that accommodations are not retroactive and must be requested each semester.

Note the last day to withdraw without instructor permission is Monday April 19, 2021.
COMPUTING AND DATA ANALYSIS

Statistical computing and data analysis are an integral part of statistical inference. We will be using R and RStudio throughout the course. Instructions for downloading R and RStudio can be found on Blackboard in the “Installing R/RStudio” section. You can expect there to be some amount of homework that will require you to use this software.

TENTATIVE LIST OF COURSE TOPICS

- Review
- General aspects of fitting regression models
- Introduction to odds ratios and risk ratios
- Models for estimating odds ratios and risk ratios
- Implications of models for estimating odds ratios and risk ratios
- Introduction to hazard ratios and survival analysis
- Models for estimating hazard ratios

STATEMENT ON DISCRIMINATION, HARRASSMENT, AND MISCONDUCT

Central Connecticut State University strives to maintain our campus as a place of work and study for faculty, staff, and students that is free of all forms of prohibited discrimination and harassment based upon age; ancestry, color; gender identity and expression; intellectual disability; learning disability; mental disorder; physical disability; marital status, national origin; race; religious creed; sex, (including pregnancy, transgender status, sexual harassment and sexual assault); sexual orientation; or any other status protected by federal or state laws. Any student who has concerns about should contact the Office of Equity & Inclusion (OEI) at 860-832-1652, Student Affairs at 860-832-1601, or their faculty member. The OEI is located on the main floor of Davidson Hall, room 119.

Central Connecticut State University (CCSU) will not tolerate sexual misconduct against students, staff, faculty, or visitors in any form, including but not limited to: sexual assault, sexual exploitation, sexual harassment or stalking, as defined in CCSU policies. For additional information, please consult the CCSU policy at https://www.ccsu.edu/diversity/policies/index.html. All faculty members and staff have a duty to report incidents of sexual harassment including sexual misconduct, intimate partner violence and stalking to Pamela Whitley, Title IX Officer, Office of Equity & Inclusion, Davidson Hall, 119.

To file a report, contact: Equity & Inclusion (860-832-1652), Student Conduct (860-832-1667) or Student Affairs (860-832-1601). For criminal complaints, contact the University Police (860-832-2375).

For support and advocacy, contact: Office of Victim Advocacy at 860-832-3795 or jflanagan@ccsu.edu; Student Wellness Services at 860-832-1945 (confidential); Women’s Center at 860-832-1655; the local YWCA’s Sexual Assault Crisis Services Hotline at 860-223-1787 (confidential) and Prudence Crandall Center for Domestic Violence (confidential) at 888-774-2900 (24-hour hotline).
ACADEMIC MISCONDUCT

At Central Connecticut State University we value personal integrity as fundamental to our interactions with each other. We believe that one of the purposes of a University education is for students to learn to think critically, to develop evaluative skills, and to express their own opinions and voices. We place special weight on academic honesty in all of our intellectual pursuits because it is a value that is fundamental to academic life and scholarly practice. All members of the University community are obligated to uphold high standards of academic honesty in their scholarship and learning. Therefore, we expect students to take personal responsibility for their intellectual work and to respect and acknowledge the ideas of others. Academic honesty means doing one's own work and giving proper credit to the work and ideas of others. It is the responsibility of each student to become familiar with what constitutes academic dishonesty and plagiarism and to avoid all forms of cheating and plagiarism.

What is Academic Misconduct?

According to the Student Code of Conduct and Statement of Judicial Procedures, academic misconduct “includes, but is not limited to, providing or receiving assistance from another, in a manner not authorized by the instructor, in the creation of work to be submitted for academic evaluation (including papers, projects and examinations).”

“Plagiarism is defined as presenting, as one’s own, the ideas or words of another person, for academic evaluation, without proper acknowledgment. Plagiarism includes, but is not limited to: (i) copying sentences, phrases, paragraphs, tables, figures, or data directly or in slightly modified form from a book, article, or other academic source without using quotation marks or giving proper acknowledgment to the original author or source; (ii) copying information from Internet Web sites and submitting it as one’s own work; (iii) buying papers for the purpose of turning them in as one’s own work; and (iv) selling or lending papers to another person for submission by that other person, for academic evaluation, as his or her own work.”

Examples of Academic Misconduct

Exams
- Copying from another person's paper or receiving unauthorized aid from another person during an examination;
- Use of unauthorized materials or devices during an examination or any other form of academic evaluation and grading; e.g., use of signals, notes, books, or calculators during an examination when the instructor has not approved their use;
- Knowingly allowing another person to copy from one’s paper during an examination;

Improper Behavior
- Use of another person as a substitute in any form of academic evaluation or acting as a substitute for another person in any form of academic evaluation. e.g., a student cannot have another person take an examination for him/her;
- Acquisition or distribution of improperly acquired examinations; e.g., stealing examinations before the test period or taking a copy of an examination from a testing room without the permission of the instructor; (Examinations which have been distributed by an instructor are legitimate study tools);
- Submission of another's material as one’s own for academic evaluation;
- Preparation of work for another student to submit for academic evaluation;
Unauthorized collaboration in the preparation of materials to be submitted for academic evaluation; e.g., working with another student on an assignment when the instructor has not authorized working together;

Submission of the same work, or substantially similar work, in more than one course without prior consent of the evaluating instructor(s);

Disruption in classroom, lab, or research and study areas; any conduct or actions that grossly or persistently interferes with the academic process. (See the CSU, Rights and Responsibilities, "Proscribed Conduct," No. 7, CCSU Student Handbook.)

**Falsification or Misuse of Academic Information**

- Falsification or misrepresentation of one’s own academic record or that of anyone else; e.g., altering a transcript for admission, hacking into the University's computer system and changing a grade, having another student take an examination in one’s place, signing someone else's name to an attendance sheet.
- Unauthorized use of information in University computer records or the computer files of other students (see Computer Use Policy);
- Using unauthorized materials or fabricated data in an academic exercise; e.g., falsifying data in a research paper or laboratory activity; conducting research on human or animal subjects without review by the appropriate panel or supervisor.

**Plagiarism**

- Copying sentences, phrases, paragraphs, tables, figures or data directly or in slightly modified form from a book, article, or other academic source without using quotation marks or giving proper acknowledgment to the original author or source.
- Copying information from internet websites and submitting it as one's own work;
- Buying papers for the purpose of turning them in as one's own work;
- Selling or lending of papers for the purpose of violating academic honesty policies (this may also be an academic crime, see Connecticut General Statutes, §53-392a.)