I. **Course Description**
Provides broad introduction to computer science. Discusses architecture and function of computer hardware, including networks and operating systems, data and instruction representation and data organization. Covers software, algorithms, programming languages and software engineering. Discusses artificial intelligence and theory of computation. Includes a hand-on component. Lecture 4 hours. Total 4 hours per week. 4 credit hours.

II. **Introduction**
This is a classroom course designed specifically for those students whose learning styles are best served by providing instructional opportunities in the traditional classroom setting.

**Prerequisites**
Computer Science is considered an intermediate level computer skill so you will need some skills before attempting this course. Students are expected to have completed several courses utilizing computers at the high school level before attempting this course. You should be proficient at the high school level in following pre-requisite skills before starting this course:

- **Keyboarding** at 30 words per minute or faster
- **Math and logic skills** or high school level Algebra I course.
- **File and folder basics** such as creating, copying, deleting and moving folders, and creating, copying, deleting, moving and finding files in the appropriate folder.
- **Windows operating system** basics such as booting up the system, starting an application, exiting an application and using the Windows help system.
- **Windows management basics** such as maximizing, minimizing, resizing, tiling and closing windows on the screen.
- **Word processing basics** such as opening, editing, saving, changing and printing existing documents and creating new documents with Word.
- **Presentation basics** such as opening, editing, saving, changing and printing existing presentations and creating new presentations with PowerPoint.
- **Web browser basics** such as using a browser to search and find specific web sites or topics with Internet Explorer, Opera, Safari, Chrome or FireFox.
- **Email skills** such as sending, reading, adding attachments, deleting and responding to messages.

V. **Instructional Materials**

- Thumb/flash drive or USB hard drive
- Notebook to take notes, Folder with pockets to organize handouts and programs
 Course Web page - http://www.nr.edu/csc200

Software
- You will need Microsoft Word or Mac Pages in order to complete most of your lecture assignments. Word is available in most labs on campus. You may also use PowerPoint and Excel to complete some assignments.
- The RobotC software is available in the Mall Lab 109 for the lab assignments. You will not need this software on your personal computer.

NRCC assumes no liability for virus, loss of data, or damage to software or computer when a student downloads software for classes.

III. Student Learning Outcomes

This course is based on the Computing Curricula Project -- a joint undertaking of the Computer Society of the Institute for Electrical and Electronic Engineers (IEEE-CS) and the Association for Computing Machinery (ACM) to develop curricular guidelines for undergraduate programs in computing. Students will be provided the opportunity to develop knowledge and skills in the following areas

- RobotC Robotics will be an important component of this course to apply your computer science knowledge. You will:
  - Use planning techniques to create a solution and algorithm to solve the problem
  - Build the robotic elements using Legos
  - Design and code the program to solve the problem using your planned solution
  - Run and test your solution using the RobotC program
  - Document your analysis, design and program logic for your program
  - Work as a team to analyze, design and implement program solutions

- This course also covers the following CS0 and CS1 topic guidelines.
  - **Computer Science:** Demonstrate an understanding of computer science and IT concepts as a foundation for taking higher level Computer Science and IT courses.
  - **Computer Systems:** Demonstrate an understanding of the basics of computing systems by describing computer system layers, hardware, software, computer users and programmers, and the history of computer generations. Explain basic concepts of information technology and applications.
  - **Number Systems:** Calculate using binary, octal, decimal and hexadecimal number systems and explain the importance to computing of bases that are powers of 2.
  - **Data Representation:** Understand and explain how data is represented, stored and managed on a computer including analog, digital, text, numbers, images, videos, and colors.
  - **Gates and Circuits:** Combine basic gates into circuits, determine circuit equivalence and describe the characteristics of the generations of integrated circuits.
  - **Computing Components:** List the components and their function, and describe the fetch-decode-execute cycle in a von Neumann machine.
  - **Problem Solving, Algorithm Design and Pseudocode:** Use pseudocode to express an algorithm. Distinguish between following an algorithm and developing one. Distinguish among selection sort, insertion sort, Quicksort, bubble sort for sorting data.
o **Programming Languages:** Describe the fundamental constructs of programming languages. Explain how procedure-oriented, visual (event-driven), object-oriented and internet languages differ.

o **Abstract Data Types and Subprograms:** Describe the fundamental constructs of abstract data types such as stacks, queues, lists, trees, binary search trees, and graphs, and know when to use each. Explain the concept of subprograms and parameters and distinguish between value and reference parameters.

o **Object-Oriented Design and High-Level Programming Languages:** Use object-oriented terminology and define the key terms.

o **Artificial Intelligence:** Explain the Turing Test. Explain the processing of an expert system. Distinguish between types of problems that humans do best and those that computers do best.

o **Simulation, Graphics, Gaming and Other Applications:** Distinguish between continuous and discrete event simulation. Give examples of complex systems and how models are used to understand them. Describe the important issues in graphics image generation.

o **Computer Security:** Describe issues related to security, privacy and ethics in Information Technology.

### IV. Instructional Methods

The course will consist of discussions, demonstrations, exercises, hands-on exercises, programming exercises, case studies, projects, assignments and exams.

### V. Instructional Materials

This section is shown on page 2 to facilitate classroom handouts.

### VI. Course Content

See [www.nr.edu/csc200](http://www.nr.edu/csc200) for assignment details and due dates for the different sections.

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Lab</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Chapter 13 Artificial Intelligence</td>
<td>Lab A Lego Teams</td>
</tr>
<tr>
<td>2</td>
<td>Chapter 14 Simulation, Graphics, Gaming and Other Applications</td>
<td>Lab B Build Robot</td>
</tr>
<tr>
<td>3</td>
<td>Chapter 17 Computer Security</td>
<td>Lab 1 Moving Straight/ Forward</td>
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<tr>
<td>4</td>
<td>Chapter 5 Computing Components</td>
<td>Lab 2 Turning</td>
</tr>
<tr>
<td>5</td>
<td>Exam 1 Chapters 13, 14, 17 and 5</td>
<td>Lab 3 Move Until Touch – Touch Sensor</td>
</tr>
<tr>
<td>6</td>
<td>Chapter 1 The Big Picture</td>
<td>Lab 4 Move Until Near – Ultrasonic Sensor</td>
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<tr>
<td>7</td>
<td>Chapter 6 Low Level Programming Languages and Pseudocode</td>
<td>Lab 6 Move Until Color - Color Sensor</td>
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<tr>
<td>8</td>
<td>Chapter 7 Problem Solving and Algorithms</td>
<td>Lab 7 Loops</td>
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<tr>
<td>9</td>
<td>Chapter 8 Abstract Data Types and Subprograms</td>
<td>Lab 8 Switches / If Else</td>
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<tr>
<td>10</td>
<td>Exam 2 Chapters 1 and 6-8</td>
<td>Lab 9 Switch Loops / Repeated Decisions</td>
</tr>
<tr>
<td>11</td>
<td>Chapter 9 Object Oriented Design and High Level Languages</td>
<td>Lab 10 Line Follower / Tracking</td>
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</table>
VII. **Evaluation**
You will earn a 0 grade for any late assignment, lab or exam. You can use a virtual pass for one week’s worth of assignments if you have an emergency. You cannot use the virtual pass for exams.

Students are expected to take all exams at the scheduled dates. No make-up exams will be given after the scheduled exam dates. You must inform your professor in advance if an emergency prevents you from attending a scheduled exam to avoid a 0 grade.

Exercises, assignments and exams will be used to evaluate this class according to the following point schedule.
**Grading:** Exam 1 = 20%, Exam 2 = 20%, Final Exam = 20%, Lecture Assignments = 20% and Labs = 20%

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>90-100%</td>
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<tr>
<td>B</td>
<td>80 – 89.9%</td>
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<tr>
<td>C</td>
<td>70 – 79.9%</td>
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<tr>
<td>D</td>
<td>60 – 69.9%</td>
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<tr>
<td>F</td>
<td>&lt;= 59.9%</td>
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</table>

VIII. **Attendance**
Regular attendance at classes is required. When absence from a class becomes necessary, it is the responsibility of the student to inform the instructor prior to the absence whenever possible. The student is responsible for the subsequent completion of all study missed during an absence. Any instruction missed and not subsequently completed will necessarily affect the grade of the student regardless of the reason for the absence.

IX. **Cheating Plagiarism Policy**
A grade of zero will be awarded to any writing assignments, labs or tests that show cheating or plagiarism. To plagiarize is “To use and pass off as one’s own the ideas or writings of another.” (Definition adapted from the American Heritage Dictionary.) Remember that plagiarism includes lifting words or ideas from Internet sites, as well as copying from print sources. You will also be subject to academic disciplinary actions such as suspension or expulsion.

X. **Withdrawal Policy**

**Student Initiated Withdrawal Policy**
A student may drop or withdraw from a class without academic penalty during the first 60 percent of a session. For purposes of enrollment reporting, the following procedures apply:
a. If a student withdraws from a class prior to the termination of the add/drop period for the session, the student will be removed from the class roll and no grade will be awarded.

b. After the add/drop period, but prior to completion of 60 percent of a session, a student who withdraws from a class will be assigned a grade of “W.” A grade of “W” implies that the student was making satisfactory progress in the class at the time of withdrawal, that the withdrawal was officially made before the deadline published in the college calendar, or that the student was administratively transferred to a different program.

c. After that time, if a student withdraws from a class, a grade of “F” or “U” will be assigned. Exceptions to this policy may be made under documented mitigating circumstances if the student was passing the course at the last date of attendance.

A retroactive grade of “W” may be awarded only if the student would have been eligible under the previously stated policy to receive a “W” on the last date of class attendance. The last date of attendance for a distance education course will be the last date that work was submitted.

Late withdrawal appeals will be reviewed and a decision made by the Director of Student Services.

**No-Show Policy**

A student must either attend face-to-face courses or demonstrate participation in distance learning courses by the last date to drop for a refund. A student who does not meet this deadline will be reported to the Admissions and Records Office and will be withdrawn as a no-show student. No refund will be applicable, and the student will not be allowed to attend/participate in the class or submit assignments. Failure to attend or participate in a course will adversely impact a student’s financial aid award.

**Instructor Initiated Withdrawal**

A student who adds a class or registers after the first day of class is counted absent from all class meetings missed. Each instructor is responsible for keeping a record of student attendance (face-to-face classes) or performance/participation (DE classes) in each class throughout the semester.

When a student’s absences equal twice the number of weekly meetings of a class (equivalent amount of time for summer session), the student may be dropped for unsatisfactory attendance in the class by the instructor.

Since attendance is not a valid measurement for Distance Education (DE) courses, a student may be withdrawn due to non-performance. A student should refer to his/her DE course plan for the instructor’s policy.

In accordance with the No-Show Policy, a student who has not attended class or requested/accessed distance learning materials by the last day to drop the class and receive a refund must be withdrawn by the instructor during the following week. No refund will be applicable.
When an instructor withdraws a student for unsatisfactory attendance (face-to-face class) or non-performance (DE class), the last date of attendance/participation will be documented. Withdrawal must be completed within five days of a student’s meeting the withdrawal criteria. A grade of “W” will be recorded during the first sixty percent (60%) period of a course. A student withdrawn after the sixty percent (60%) period will receive a grade of “F” or “U” except under documented mitigating circumstances when a letter of appeal has been submitted by the student. A copy of this documentation must be placed in the student’s academic file.

The student will be notified of the withdrawal by the Admissions and Records Office. An appeal of reinstatement into the class may be approved only by the instructor.

XI. Disability and Diversity Statements

If you are a student with a documented disability who will require accommodation in this course, please register with the Disability Services Office located in the Counseling Center for assistance in developing a plan to address your academic needs.

The NRCC community values the pluralistic nature of our society. We recognize diversity including, but not limited to, race, ethnicity, religion, culture, social class, age, gender, sexual orientation and physical or mental capability. We respect the variety of ideas, experiences and practices that such diversity entails. It is our commitment to ensure equal opportunity and to sustain a climate of civility for all who work or study at NRCC or who otherwise participate in the life of the college.

XII. Student Services Resources

The Accountability in Student Learning Program (ASLP) Team connects students to the resources they need in order to meet their educational goals. Connection Specialists and Career Coaches intentionally engage students who may be in need of academic advising, tutoring, or help in overcoming obstacles to academic success such as lack of books, computers or Internet access at home. NRCC and the ASLP program cannot solve every problem; however, they CAN connect you to various community resources that are available. The ASLP Team also creates opportunities for students with similar backgrounds, goals and/or challenges to come together to support each other. If you are in need of academic assistance or other types of support – or if you have an idea for supporting student success and you don’t know where to go – let us know. To contact the ASLP office for any reason, including to find out who your connection specialist is, email aslp@nr.edu or call (540)674-3677 or drop by Godbey 53 (in Dublin) or room 103 at the Mall Site.

Evacuation Procedure: Please note the evacuation route posted at the classroom doorway. Two routes are marked in case one route might be blocked.