Rowan College at Burlington County

Science, Technology, Engineering, and Mathematics Division

Course Title: Advanced Programming Workshop III

Course Code: CSE 224 – 100

Class Time: Mon/Wed 6:00 – 7:50

Location: TEC 306

Prerequisites: CSE 112 or CSE 135 or CIS 139

Credits: 2

Contact Hours: 1/2/0

Instructor: Chris Simber **email:** csimber@rcbc.edu **Phone:** x 2090

Office: TEC – 211G **Office hours**: M/W 11:00 – 12:00, T/TH 3:00 – 4:00
Others by appointment

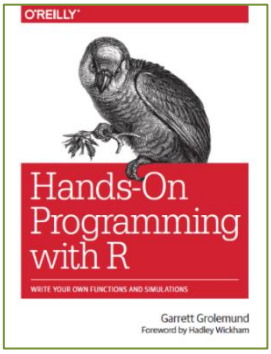
SECTION 1:

Course Description: This is an advanced course in programming languages, integrated development environments (IDE's), application programming interfaces (API's), software packages, libraries, data analytics, and programming technologies. The workshop nature of the course requires hands-on solutions in a high-level language, including requirements definition & decomposition, IPO development, and algorithm design, development, and implementation.

Web-enhanced: This is a web-enhanced course and will utilize **Blackboard** as a repository for course materials.

Required Text: Hands-On Programming with R,
Garrett Grolemund, O'Reilly, ISBN: 978 1 449 35901 0

OER Creative Commons: https://rstudio-education.github.io/hopr/



Required Materials: Access to a computer capable of running the R-Studio IDE. The IDE and/or the project files can be stored on a flash drive for convenience. College computers have R-Studio installed.

General Education Outcomes:

- Written and Oral Communication: Communication
  - Students will logically and persuasively support their points of view or findings
- Technology Competency or Information Literacy: Technology
  - Students will demonstrate the skills required to find, evaluate, and apply information to solve a problem

Course Learning Outcomes: Upon completion of this course, students will be able to:

- Perform abstract and requirements decomposition, and develop a complex software solution in the R programming language utilizing an Integrated Development Environment (IDE) to write and test programs.
- Develop data analysis programs in the R programming language utilizing packages and data analysis techniques, procedures, and tools.
- Design and implement data plots and charts, using code libraries and advanced language features in programs to perform specific tasks
- Design and write programs using advanced concepts and operations in a collaborative environment.
- Analyze medium to high complexity operations and effectively break down problems into sub-problems utilizing logical thinking and engineering ethics to develop efficient algorithms and the programmed solutions.

Core Course Content:

- Abstract Decomposition and Requirements Definition
- Input, Processing, and Output (IPO) generation for data analysis
- Algorithm Design and Development
- Integrated Development Environments
- Advanced Programming, data analysis, and data reduction
- Language specific functions, operations, and data analysis packages
- Functions, R-Notation, and Charting and Plotting data

SECTION 2:

Course and Classroom Policies:

Expectations: Students are expected to attend class sessions, be prepared, complete assignments and submit them on or before the due date, and to conduct themselves in a professional manner in class sessions and discussion forums.

Class Attendance when a course is not meeting face-to-face is determined as logging into Blackboard and RCBC email on a daily basis to review announcements and course materials.

Required email: Students are assigned an email account by the college (*name@mymail.rcbc.edu*), and are to use this account to correspond with the instructor, and submit assignments.

Criteria for Grade Determination:

Grading: Grades will be based on meeting the requirements of the programming projects.

Projects: there are four (4) programming projects for the course that will be completed and submitted using the project templates provided.

The workshop nature of the course requires research and experimentation with the language to design and develop the solutions. Collaboration is encouraged.

Late submissions will receive a **penalty of three (3) points per day** after the first day, and will **not** be accepted **more than one (1) week late**.

Assessment Methods:

Project #1 – Virtual Dice	15%
Project #2 – Dealing Card Deck	15%
Project #3 – Shuffle and Deal	15%
Project #4 – Hearts and Blackjack	15%
Project #5 – Ending Play	15%
Case Study	25%
Total	100%

Letter Grades

A	= 90 - 100
B+	= 85 - 89
B	= 80 - 84
C+	= 75 - 79
C	= 70 – 74
D	= 60 - 69
F	= Below 60

Course Outline/Schedule (tentative):

Week	Application/Chapter	
1	Introduction to the Course	
	The R Programming language – The Very Basics (Chapter 2)	
2	The Very Basics (Chapter 2)	
	The RStudio IDE	
3	R Packages (Chapter 3)	
	Project #1 requirements	Project #1
4	Loading and Saving Data in R	
	Project #2 requirements	Project #2
5	R Objects (Chapter 5)	
6	R Notations (Chapter 6)	
	Project #3 requirements	Project #3
7	Modifying Values (Chapter 7)	

8	Environments (Chapter 8)	
	Project #4 requirements	Project #4
9	Programs (Chapter 9)	
10	S3, Functions, Methods, and Classes (Chapter 10)	
11	Loops and Probability (Chapter 11)	
	Project #5 requirements	Project #5
12	Speed and Vectorized Code (Chapter 12)	
13	Case Study Workshop	
14	Case Study Workshop	
15	Case Study Completion	Case Study

* Course Outline is subject to change

SECTION 3:

College Policies: In order for students to know their rights and responsibilities, all students are expected to review and adhere to all regulations and policies as listed in the College Catalog and Handbook. The current college catalog and student handbook are important documents for understanding your rights and responsibilities as a student in the RCBC classroom. Please read your catalog and handbook as they supplement this syllabus, and can be accessed at rcbc.edu/publications. Important policies and regulations include, but are not limited, to the following:

- College Attendance Policy
- Grading Standards
  - Withdraw (W) and Incomplete Grades (I)
  - Withdrawal date for this semester – Academic Calendar
- Student Code of Conduct
  - Academic Dishonesty/Plagiarism and Civility
- Use of Communication and Information Technology

Weather Closure: In the event that the College is closed due to weather, students should access the course Blackboard shell for announcements and course material.

- **Academic Integrity Code**
- ***Plagiarism*** – Plagiarism includes copying or paraphrasing another's words, ideas, or facts without crediting the source; submitting a paper written by someone else, either in whole or in part, as one's own work; or submitting work previously submitted for another course or instructor. Plagiarism on any assignment will result in failure for that assignment and may result in further disciplinary action, including but not limited to failure for the course. Please refer to the Student Handbook for additional information regarding plagiarism and College regulations.

- ***Texting, Cell phones, and Laptops*** – should be turned off in class or the ringer must be turned to silent. No texting is allowed in class during instruction time.

- ***Internet and Other Computer Use*** – all students are required to abide by established RCBC computer and Internet use procedures and regulations. Willful damage to or misuse of RCBC computers and/or software will be considered a violation of the RCBC Student Code of Conduct. Criminal prosecution may also result. This applies to IPODS, games or electronics of any kind, instant messenger, and social media.

Student Conduct Code - We shall abide by the expectations outlined in the Student Handbook (page 106-112). RCBC students are accountable according to the standards established in this policy. http://www.rcbc.edu/conduct

Tutoring - RCBC offers free tutoring for all currently enrolled students. For more information regarding the Tutoring Center, please call extension 1495 at (609) 894-9311 or visit the Tutoring Center website at: **http://www.rcbc.edu/tutoring**

Academic Advisement – RCBC provides Academic advising and free referral services to all students through the office of Academic Advising. Call extension 7337 at (856) 222-9311 or visit the website at: http://www.rcbc.edu/advising

Library Resources – The RCBC Library provides access to the information resources you need to succeed in your studies, including books, journals and databases. Library Information Specialists provide support in finding and utilizing these resources. Library services are available at the Mount Laurel campus Student Success Center and online at http://www.rcbc.edu/library. Online services include IM Chat, text, and phone support during regular hours and access to a wide variety of journals and databases 24/7/365 from both on and off campus. Library hours are posted in the libraries and on the library website.

Office of Student Support and Disability Services: RCBC welcomes students with disabilities into the college's educational programs. Access to accommodations and support services for students with learning and other disabilities is facilitated by staff in the Office of Student Support (OSS). To receive accommodations, a student must contact the OSS, self-identify as having a disability, provide appropriate documentation, and participate in an intake appointment. If the documentation supports the request for reasonable accommodations, the OSS will provide the student with an Accommodation Plan to give to instructors. For additional information, please contact the Office of Student Support at 609-894-9311, ext. 1208, disabilityservices@rcbc.edu, or http://www.rcbc.edu/studentsupport.

Educational Technology Statement: Rowan College at Burlington County (RCBC) advocates the use of technology to enhance instruction. Students should assume that classroom and online technology will be used throughout their coursework at RCBC, as it will most certainly be used in their future education and careers. The College provides on-campus facilities for the convenience of the RCBC community. Various college departments, including the Office of Information

Technology and the Office of Distance Education, provide technology training and assistance to faculty and students.

Student Success Services: RCBC offers a variety of free services for its students including those listed below. Descriptions of these services, as well as many others, can be found in the College Catalog and Handbook and on the RCBC website at rcbc.edu/publications.

- Academic Advisement (rcbc.edu/advising)
- Career Services (rcbc.edu/careers)
- Educational Opportunity Fund (EOF) (rcbc.edu/eof)
- Financial Aid (rcbc.edu/financialaid)
- International Students Office (rcbc.edu/international)
- Library/Integrated Learning Resource Center (ILRC) (rcbc.edu/library)
- Office of Veteran Services (rcbc.edu/vets)
- Student Support Counseling (rcbc.edu/cpit)
- Tutoring Center (rcbc.edu/tutoring)
- Test Center (rcbc.edu/testcenter)
- Transfer Services (rcbc.edu/transfer)