



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

| COURSE PLAN – PART I   |   |                          |            |
|--|---|--------------------------|------------|
| Name of the programme and specialization   | M.Tech Computer Science and Engineering         |                          |            |
| Course Title   | Advanced Programming Laboratory                 |                          |            |
| Course Code  | CS607   | No. of Credits           | 2          |
| Course Code of Pre-requisite subject(s)  |   |                          |            |
| Session  | July 2021                                       | Section (if, applicable) | -          |
| Name of Faculty  | Dr. R. Mohan                                    | Department               | CSE        |
| Official Email   | rmohan@nitt.edu                                 | Telephone No.            | 9442421326 |
| Name of Course Coordinator(s) (if, applicable)   | Dr. Sayantan S Nath                             |                          |            |
| Official E-mail  | sayantan@nitt.edu                               | Telephone No.            | 9477033935 |
| Course Type (please tick appropriately)  | Laboratory Course                               |                          |            |
| <b>Syllabus (approved in Senate)</b>   |   |                          |            |
| <ul style="list-style-type: none"> <li>Exercises using Linux tools – Grep, awk, tr</li> <li>Exercises using system calls</li> <li>Exercises in Python</li> <li>Exercises in C++/ Java</li> </ul> <p><b>Textbooks:</b></p> <ul style="list-style-type: none"> <li>Arnold Robbins, Nelson H. F. Beebe, Classic Shell Scripting, O'Reilly Media 2005</li> <li>H. Schildt Java: The Complete Reference, Eighth Edition, McGraw-Hill Education (India) Pvt. Limited, 2011.</li> <li>H. Schildt C++: The Complete Reference, Fourth Edition, McGraw-Hill Education (India) Pvt Limited, 2003.</li> <li>Mark Lutz Learning Python, 3rd Edition, O'Reilly Media, 2007</li> </ul> |   |                          |            |
| <b>COURSE OBJECTIVES</b>   |   |                          |            |
| <ul style="list-style-type: none"> <li>To explore the features of object-oriented programming.</li> <li>To focus programming rather on programming language.</li> <li>To understand the OS internals.</li> </ul>   |   |                          |            |
| <b>MAPPING OF COs with Pos</b>   |   |                          |            |
| Course Outcomes  | Programme Outcomes (PO)<br>(Enter Numbers only) |                          |            |
| <ul style="list-style-type: none"> <li>Develop shell scripts for various applications.</li> </ul>  | 1, 3, 6   |                          |            |



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|  |         |
|--|---------|
| <ul style="list-style-type: none"> <li>Gain knowledge about OS internals.</li> </ul>                                   | 1, 2, 5 |
| <ul style="list-style-type: none"> <li>Understand Object oriented concepts and developing software modules.</li> </ul> | 1, 2, 4 |

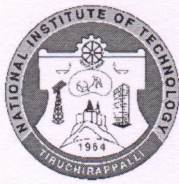
**COURSE PLAN – PART II**

**COURSE OVERVIEW**

The objective of the course is to teach students advanced problemsolving through programming. It aims to train students in realizing computer algorithms with efficient Linux, Python, C++ and Java programs.

**COURSE TEACHING AND LEARNING ACTIVITIES**

| Sl. No. | Week/Contact Hours | Topic   | Mode of Delivery                             |
|---------|--------------------|---|--|
| 1       | 1 Week             | 1. Write shell scripts to demonstrate various string operations such as finding length of a given string, substring extraction, substring removal, substring replacement and index.<br>2. Write a shell script to search an element from an array using binary searching. | Problem Solving / Demo and Hands-On Practice |
| 2       | 1 Week             | Depict the usage of friend functions in C++ with a program.   | Problem Solving / Demo and Hands-On Practice |
| 3       | 1 Week             | Demonstrate the concept of Multiple Inheritance in C++.   | Problem Solving / Demo and Hands-On Practice |
| 4       | 1 Week             | Write a Program to implement the following Polymorphism concepts in C++:<br>(i) Operator Overloading<br>(ii) Function Overriding  | Problem Solving / Demo and Hands-On Practice |
| 5       | 1 Week             | Write a JAVA Program to implement at least five Collections Framework in JAVA.  | Problem Solving / Demo and Hands-On Practice |
| 6       | 1 Week             | Write a program in JAVA to implement the following Design Patterns with different examples:<br>(i) Façade Design Pattern<br>(ii) Chain of Responsibility Design Pattern<br>(iii) Flyweight Design Pattern   | Problem Solving / Demo and Hands-On Practice |



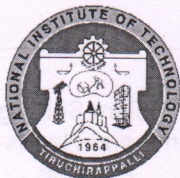
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|----|--------|--|--|
| 7  | 1 Week | Develop a JAVA Program to implement the following standard algorithms in Pattern Searching<br>a) Knuth Morris Pratt (KMP) Algorithm<br>b) Robin Karp Algorithm         | Problem Solving / Demo and Hands-On Practice |
| 8  | 1 Week | 1. Design an application that demonstrates the concept of deadlock between threads in JAVA<br>2. Develop a JAVA program to demonstrate the Dining Philosophers Problem | Problem Solving / Demo and Hands-On Practice |
| 9  | 1 Week | Develop a JAVA program to demonstrate the concept of Socket Programming.   | Problem Solving / Demo and Hands-On Practice |
| 10 | 1 Week | Write a program in Python to Demonstrate the usage of Regular Expression for text pre-processing tasks.  | Problem Solving / Demo and Hands-On Practice |
| 11 | 1 Week | Demonstrate the concept of Linear Regression for a simple prediction scenario in Python using at least 2 features.   | Problem Solving / Demo and Hands-On Practice |
| 12 | 1 Week | Develop a Python program to find the SHA-1 message digest of a file.   | Problem Solving / Demo and Hands-On Practice |

**COURSE ASSESSMENT METHODS** (shall range from 4 to 6)

| S.No. | Mode of Assessment                                    | Week/Date                | Duration | % Weightage |
|-------|---|--------------------------|----------|-------------|
| 1     | Regular Lab Class Assessments ( Min. Assessments: 10) | Regular Lab class        |          | 30          |
| 2     | Model Exam I  | 08.10.2021 to 09.10.2021 | 90 Min   | 20          |
| 3     | Model Exam II   | 08.11.2021 to 09.11.2021 | 90 Min   | 20          |
| 4     | Compensation Assessment*                              | 01.12.2021 to 03.12.2021 | 90 Min   | 20          |
| 5     | Semester Lab Exam                                     | As per Academic Schedule | 120 Min  | 30          |

\*mandatory; refer to guidelines on page 5

**COURSE EXIT SURVEY** (mention the ways in which the feedback about the course shall be assessed)



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Feedbacks are collected before final examination through MIS or any other standard format followed by the institute.

### **COURSE POLICY** (including compensation assessment to be specified)

One compensation assessment will be conducted for absentees in Model exam

### **MODE OF CORRESPONDENCE** (email/ phone etc)

Email : rmohan@nitt.edu

### **ATTENDANCE POLICY**(A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

### **ACADEMIC DISHONESTY & PLAGIARISM**

- Carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The above policy against academic dishonesty shall be applicable for all the programmes.

### **ADDITIONAL INFORMATION, IF ANY**

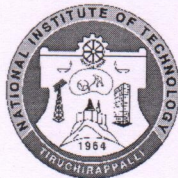
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### **FOR APPROVAL**

Dr. R. Mohan  
Course Faculty

Dr. N. Ramasubramanian  
CC-Chairperson

Dr. Rajeswari Sridhar  
HOD



**Guidelines**

- a) The number of assessments for any theory course shall range from 4 to 6.
- b) Every course shall have a final assessment on the entire syllabus with at least 30% weightage.
- c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.
- d) The passing minimum shall be as per the regulations.

| B.Tech. Admitted in                               |      |   |      | P.G. |
|---|------|---|------|------|
| 2018  | 2017 | 2016  | 2015 |      |
| 35% or (Class average/2)<br>whichever is greater. |      | (Peak/3) or (Class Average/2)<br>whichever is lower |      | 40%  |

- e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.
- f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.
- g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.