KIET GROUP OF INSTITUTIONS, DELHI-NCR, GHAZIABAD
DEPARTMENT OF COMPUTER APPLICATIONS

COURSE OUTCOMES AND MAPPING WITH PO, 2019-20

COURSE OUTCOMES:

MCA-I Semester

RCA-101
Computer Concepts & Principles of Programming
CO1: The concept of programming language, designing of solution to a problem using flowchart & algorithm.
CO2: The concept of Arrays, modular programming, Looping, Condition Checking, Records & their implementation.
CO3: The functional units of computer, its operations, the number system used in computer and their conversions.
CO4: The concept of operating system and various computing models.
CO5: The OOP concept like Abstraction, Encapsulation, Inheritance, Polymorphism, Static and Dynamic scope and concept of Recursion.

RCA-102
Accounting & Financial Management
CO1: To provide a comprehensive treatment of accounting principles, techniques and practices.
CO2: To get the students acquainted with fundamental concepts and processes of accounting so that they are able to appreciate the nature of item presented in the annual accounts of an organization.
CO3: To have basic understanding of significant tools and techniques of financial analysis useful in the interpretation of financial statements.
CO4: To have basic understanding of Fund flow statement and Cash flow statement for financial analysis.

RCA-103
Discrete Mathematics
CO1: Use logical notation to define and reason about fundamental mathematical concepts such as sets, relations and functions.
CO2: Understand basic concepts of partial ordered relations, lattices and their properties.
CO3: Have an understanding of the fundamental concepts used in digital electronics i.e. digital circuits, Boolean algebra and Karnaugh map.
CO4: Evaluate elementary mathematical arguments and identify fallacious reasoning. Produce convincing arguments; discriminate between valid and invalid arguments.
CO5: Calculate numbers of possible outcomes of elementary combinatorial processes such as permutations and combinations.

RCA-104
Computer Organization & Architecture
CO1: To understand the basic concepts of digital electronics i.e. number system including floating point representation and Booth multiplication algorithm, to combinational circuits and sequential circuits.
CO2: To understand the working of register transfer, computer bus system, Arithmetic Logic Unit (ALU) and memory organization.
CO3: To understand the design of control unit of a computer system including hardwired and micro-programmed control design.
CO4: To understand the organization of processor and input output devices.
CO5: To understand the concept of computer architecture, classification, pipelining and parallel processing with its challenges.

RCA-105
Professional Communication
CO1: Emphasize over learning effective office communication and removing barriers.
CO2: Be proficient in technical written communication with correct usage of grammar, vocabulary and sentence construction.
CO3: Be proficient in business writing skill: various types of letter, report, proposal and job application with resume.

CO4: Enrich ability in presentation and public speaking through the proper usage of paralinguistic features and body language.
CO5: Enrich ability to understand complex text through comprehension passage in form of philosophical essay and find value points from text.

RCA-151
Professional Communication Lab
CO1: Emphasize over learning effective communication and presentation orally through digital language lab.
CO2: Be proficient in writing skill: letter, report, proposal and review through digital language lab.
CO3: Surge articulation through soft skill training to meet out the challenges of corporate sector.
CO4: Enrich ability in presentation and public speaking through the practice of GD, Presentation, Extempore and role play.
CO5: Create and boost up confidence to confront the challenges of professional world focusing upon kinesics and paralinguistic features.

RCA-152
Programming Lab
CO1: The Use of various C data types, operators and their use, I/O operations.
CO2: The concept of iteration, decision making and its application in program design.
CO3: The concept of Arrays, modular programming, Structure, File handling and its implementation.

MCA II Semester

RCA201
Computer Based Numerical and Statistical Techniques
CO1: Represent floating point numbers and able to find the root of polynomial and transcendental equation by iterative methods with concept errors.
CO2: Solved linear equations by direct and iterative methods and interpolation formulae for approximation of polynomials.
CO3: Solved ordinary differential and integral equations using Simpson's, Boole's, Weddle's, Euler's, Runge-Kutta, etc.
CO4: Understand concept of regression analysis and curve fittings.
CO5: Understand concept of Time series, moving averages and testing of hypothesis by various tests of significance.

RCA-202
Data Structures
CO1: Understand the concepts of data structures and linear data structures like Arrays, Stacks and its applications.
CO2: Understand and implement linked list and queues.
CO3: Understand the concept of non-linear tree data structure and to be familiar with advanced data structures like AVL.
CO4: Learn about various searching and sorting algorithms.
CO5: Familiar with graph algorithms and file structures.

RCA-203
Introduction to Automata Theory & Languages
CO1: Apply a number of proof techniques in language design and understand the equivalence between Non-deterministic Finite State Automata and Deterministic Finite State Automata.
CO2: Understand the concept of regular grammar and expression and design various automata and their use in real applications.
CO3: Understand the equivalence between Context-Free Grammars and Non-deterministic Pushdown Automata.
CO4: Appreciate the power of the Turing Machine, as an abstract automaton, that describes computation, effectively and efficiently.
CO5: Develop a clear understanding of undecidability.

RCA 204
Innovation and Entrepreneurship
CO1: The ability to assess the need for innovation, initiate the process and run innovations in organizations.
CO2: Be able to develop and cultivate endurance
CO3: The ability to evaluate opportunities and understand recent developments
CO4: The ability to seize opportunities, organize and finance viable initiatives through to fruition.
CO5: Ability to analyse the different types of entrepreneurships.

RHU-001
Human Value and Professional Ethics
CO1: Need, Basic Guidelines, Content and Process for Value education.
CO2: Understanding Harmony in the Human Being - Harmony in Myself!
CO3: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship.
CO4: Understanding Harmony in the Nature and Existence - Whole existence as Co-existence.
CO5: Implications of the above Holistic Understanding of Harmony on Professional Ethics

RCA-251
CBNST Lab
CO1: Students will be able to understand about different methods to solve algebraic and transcendental equations and interpolation methods.
CO2: Students will be able to understand numerical technique for applying in engineering and Statistical problem.
CO3: Students will be able to present and discuss results of output generated by hand or from software packages preferably in C Programming language.

RCA-252
Data Structure Lab
CO1: Implement static and dynamic linear data structures.
CO2: Implement non linear data structures.
CO3: Understand and implement various sorting and searching algorithms.

MCA-III Semester

RCA-301
Operating Systems
CO1: The basics of computer system and overview of operating system along with its functions.
CO2: The processes, their states, threads, Multicore and Multithreading.
CO3: The CPU scheduling algorithms, Inter process communications, process synchronization and deadlocks.
CO4: Various memory management techniques with case study on Windows and Linux.
CO5: Various I/O management and file system.

RCA-302
Web Technology
CO1: To understand internet and web designing concepts.
CO2: To create web pages using HTML, CSS and by using various designing frameworks and libraries.
CO3: To build dynamic web pages using client side scripting language JavaScript and to write XML document.
CO4: To build interactive web application using PHP.
CO5: To construct and manipulate database of web application using PHP and MySQL.

RCA-303
Design & Analysis of Algorithms
CO1: Able to analyze worst-case and average case running times of various sorting algorithms using asymptotic analysis.
CO2: Able to implement various advance data structures like red black tree, binomial heap, Fibonacci heap etc.
CO3: Able to solve real life problem using problem solving techniques i.e. divide- conquer and greedy method,
CO4: Able to solve real life problem using problem solving techniques i.e. dynamic programming, backtracking, branch –bounds.
CO5: Able to understand various new problems of research and mathematical computation using advanced problem solving techniques i.e. approximation and randomization.

RCA-304
Computer Based Optimization Techniques
CO1: Various types of inventory models and their application.
CO2: Solution of linear programming problems using different methods.
CO3: Integer linear programming problem, transportation problems and assignment models with various applications.
CO4: Concept of non-linear programming problem, K-T conditions of optimality.
CO5: Queuing models and their classification with application and limitations for its applications.

RCA 305
Cyber security
CO1: Understand information system and its development in regard of security threats.
CO2: Understand application security and required counter measures
CO3: Practical aspects in respect of secure application development and security maintenance.
CO4: Understand role of policies while dealing with information security and the role of governing acts in terms of safeguarding our intellectual properties.

RCA-A01
Introduction to Programming and Computer Organization
CO1: Use logical notation to define and reason about fundamental mathematical concepts such as sets, relations and functions.
CO2: Have an understanding of the fundamental concepts used in digital electronics i.e. number system, digital circuits, Boolean algebra nd gate minimization techniques.
CO3: Have an understanding of instruction sets, computer arithmetic, CPU structure and pipelining hazards.
CO4: Ability to design flowchart and algorithmic solution to problems and gather the extensive knowledge in C programming.

RCA-351
Operating Systems Lab
CO1: The commands of UNIX and Linux operating systems.
CO2: Learn about shell programming and writing various shell scripts.
CO3: Implement various CPU scheduling algorithms and Page replacement algorithms.

RCA-352
Design and Analysis Algorithm Lab
CO1: Able to Implement and analyse different searching algorithms by showing their performance using graph.
CO2: Able to Implement and analyse different sorting algorithms by showing their performance using graph
CO3: Study of advance topic like NP-Complete theory and Bitonic sorting network

MCA-IV Semester

RCA-401
Database Management System
CO1: Understanding introductory database concepts like DBMS architecture, data models and file system.
CO2: Understanding relation model, constraints over relations and relation algebras.
CO3: Understand conceptual; data model (E-R model), conversion of E-R model to relational model, functional dependencies and its application in normalization.
CO4: Understand use of SQL and the concepts like, constraints, trigger, views etc.
CO5: Understand the concept of various indexing techniques, query execution, transaction management, concurrency control and distributed database.

RCA-402
Computer Network
CO1: Students will be able to describe standard communication model such as TCP/IP, ISO-OSI model, functionality/working of various network topologies along with communicating devices and different type of communication media used in data communication.
CO2: Students will be able to apply knowledge of different flow control techniques along with error detection and correction to detect and solve error single bit during data transmission.
CO3: Students will be able to classify various IP addressing techniques along with network routing protocols and algorithms.

CO4: Students will be able to understand various transport layer protocols and their design considerations along with congestion control.
CO5: Students will be able to understand applications-layer protocols such as HTTP, FTP, Telnet, SMTP etc. and their interaction with underlying services along with familiarization with cryptography and network security.

RCA- 403
Artificial intelligence
CO1: Identify potential areas of AI applications and understand different ways to implement them.
CO2: Implement and understand about various searching and development strategies to support the creation of AI behavior in game theory.
CO3: Understand about knowledge and its representation on certain phenomena of the real world to recognize the logical reasoning steps in a mathematical proof in natural language.
CO4: Present different types machine learning algorithms and extracting knowledge models from data.
CO5:Gain knowledge about state-of-the-art algorithms used in pattern recognition area and able to apply in practical real world problems.

RCA- 404
Compiler Design
CO1: Able to explore various kind of finite and non finite automata with language, grammar and regular expression to identify tokens with understanding of different phases of compiler design.
CO2: Able to know, how tokens rcognized during lexical analysis phase and improve understanding of compiler construction tool i.e. LEX.
CO3: Able to Identify the analysis phase, similarities and differences among various parsing techniques and grammar transformation techniques and able to Implement major parsing techniques ranging from the recursive decent methods to the computationally more intensive LR techniques that have been used in parser generator.
CO4: Able to translate common programming language constructs into intermediate code and identify the effectiveness of optimization and effectively generate machine codes.
CO5: Able to apply the several algorithms for collecting and optimizing the information using data flow analysis.

RCA-E11
Design & Development of Applications
CO1: Understand Android architecture, installation and configuration of Android Studio, Intents and Activities, Testing and Debugging of Mobile App.
CO2: Learn use of built-in layouts, GUI components and Testing UI.
CO3: Learn Android Internet Connection, Notifications and managing Background Tasks.
CO4: Understand basics of SQLite Database, Data Sharing, Content Resolvers and Content Providers.
CO5: Learn publishing App on play store, Google Services, Firebase, Google Cloud Messaging.

RCA A02:
Fundamental of Data Structure, Numerical & Computational Theory
CO1: To be able to utilize knowledge of basic data structure i.e array, linked-list and tree with concept of sorting and searching
CO2: To be able to understand time series and hypothesis of testing with curve fitting and regression analysis
CO3: To be able to explore various kind of finite and non finite automata with language, grammar and touring machine

RCA-451
Mini Project Lab
CO1: To analyse and describe the project.
CO2: To formulate clear work plan and procedures.
CO3: To design the software by various designing techniques.
CO4: To implement a project by using various programming language.
CO5: To design report and able to present their work.

RCA-452
Database Management System Lab
CO1: Use the SQL commands such as DDL, DML, TCL and DCL in Oracle
CO2: Design E-R model using CASE tools.

CO3: Write PL/SQL code using Oracle.

MCA-V Semester

RCA-501
Computer Graphics & Animation
CO1: To understand the concepts of computer graphics and implementation of image creation and filling algorithms.
CO2: To understand the concept of viewing and implement clipping algorithms & transformations.
CO3: To understand the concept of projection and theory related to visible surface detection.
CO4: To implement Bezier curves and study concepts related to illumination models.
CO5: To understand fundamentals of animation and its techniques.

RCA-502
Software Engineering
CO1: To understand Software Engineering Concepts and various SDLC models
CO2: To prepare Software Requirement Specification (SRS), use of Modelling tools and get knowledge of quality standards
CO3: To understand design concepts and engineering approach to software development
CO4: To gain knowledge for testing of software
CO5: Learning of different software project management activities

RCA-E31
Cloud Computing
CO1: Subject will provide an insight to the concepts and principles, history, issues and benefits of different clouds as well as awareness of open source clouds.
CO2: To enable students exploring some important cloud computing driven commercial systems such as GoogleApps, Microsoft Azure and Amazon Web Services, IBM and other businesses cloud applications.
CO3: To impart knowledge about cloud computing and its application in business, education, company and in personal life.
CO4: To familiarize students with the concept of application security and the concept of virtualization in cloud computing.
CO5: To Identify security and privacy issues in cloud computing and to recognize security threat exposure within a cloud computing infrastructure

RCA-E45
Big Data
CO1: Explain the Big Data Fundamentals, including the evolution & characteristics of Big Data, and various business domain for Big Data & its challenges.
CO2: Apply non-relational databases (NoSQL), the techniques for storing and processing large volumes of structured and unstructured data, as well as streaming data
CO3: Learn Hadoop Ecosystem and make sense of how to function with Hadoop Distributed File System (HDFS) for limit and resource organization
CO4: Understand Hadoop MapReduce framework and the working of MapReduce on data stored in HDFS. Also learn about YARN concepts in MapReduce.
CO5: Learn high-level query language like HIVE, Pig and use of Big Data Analytics tools.

RCA-E24
Software Testing
CO1: To study fundamental concepts in software testing, how to plan a test project, design test cases, conduct testing operations, generate a testing report, SRS documentation and verification.
CO2: Understand the importance of functional testing & its types
CO3: To gain knowledge about Regression Testing
CO4: To understand automated testing concepts and use of automation tools for testing.
CO5: To learn the concept of object-oriented testing.

RCA-551
Computer Graphics & Animation Lab
CO1: To implement algorithms related to creation of 2 dimensional objects.

CO2: To implement algorithms related to object transformations and filling.
CO3: To implement clipping algorithms and designing animations by using Flash.

RCA-552
Project Based on Software Engineering
CO1: Learn about different software development process models and software engineering principles and develop an ability to apply them to software design of real-life problems.
CO2: Plan, analyze, design and implement a software project using programming languages like Java, Python, R etc.
CO3: To design report and able to present work with their team.

MCA-VI Semester

RCA-611
Colloquium
CO1: To survey the current affairs in IT industry.
CO2: Able to represent the survey in form of presentation.
CO3: To enhance self-learning capabilities.

RCA-612
Industrial Project
CO1: To understand and implement the concepts of software life cycle models.
CO2: To identify the resources required for a project, to produce a work plan and resource schedule.
CO3: To evaluate and access the current technologies or modern tools related to software development.
CO4: To design, test, implement and document the project as per industry requirement.
CO5: Adapt to the changing demands in the workplace and able to perform increasingly complex tasks, as well as tasks outside a field of expertise.

MAPPING WITH PO:

MCA-I Semester

RCA-101
Computer Concepts & Principles of Programming

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	–	–	–	–	–	–	–	–	–	–
CO2	2	2	–	–	–	–	2	–	–	–	–	–
CO3	2	–	–	–	–	–	–	–	–	–	–	–
CO4	2	–	2	–	–	–	–	–	–	–	–	–
CO5	2	–	–	–	1	–	2	–	–	1	–	–
PO Target	2	2.5	2	–	1	–	2	–	–	1	–	–

RCA-102
Accounting & Financial Management

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	–	–	1	–	1	–	3	–	–	1	1
CO2	1	2	–	1	1	1	–	3		–	1	1
CO3	2	2	–	2	1	1	–	3	2	–	1	1
CO4	2	2	–	2	1	1	–	3	2	–	1	1
PO Target	1.5	2	–	1.5	1	1	–	3	2	–	1	1

RCA-103
Discrete Mathematics

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	–	2	3	–	–	–	–	–	–	–
CO2	3	–	–	–	–	–	–	–	–	–	–	–
CO3	3	2	–	–	–	–	–	–	–	–	–	–
CO4	3	3	–	2	3	–	3	–	–	–	–	–
CO5	3	3	–	3	3	–	2	–	–	–	–	–
PO Target	3	2.7	–	2.3	3	–	2.5	–	–	–	–	–

RCA-104
Computer Organization & Architecture

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	–	–	–	–	–	–	–	1	–
CO2	3	2	1	–	–	–	–	–	–	–	–	–
CO3	3	2	–	–	–	–	–	–	–	–	–	–
CO4	3	2	–	–	–	–	–	–	–	–	–	–
CO5	2	–	–	–	–	–	–	–	–	–	–	–
PO Target	2.8	2.25	1	–	–	–	–	–	–	–	1	–

RCA-105
Professional Communication

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	–	–	–	–	–	3	–	3	–	3	–

CO2	–	–	–	–	–	–	3	–	3	–	3	–
CO3	–	–	–	–	–	–	3	–	3	–	3	–
CO4	–	–	–	–	–	–	3	–	3	–	3	–
CO5	–	–	–	–	–	–	2	–	2	–	3	–
PO Target	–	–	–	–	–	–	2.6	–	2.6	–	3	–

RCA-151
Professional Communication Lab

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	–	–	–	–	–	1	–	3	–	3	2
CO2	–	–	–	–	–	–	3	–	3	–	3	3
CO3	–	–	–	–	–	–	3	–	3	–	3	2
CO4	–	–	–	–	–	–	3	–	3	–	3	2
CO5	–	–	–	–	–	–	3	–	3	–	3	
PO Target	–	–	–	–	–	–	2.6	–	3	–	3	2.5

RCA-152
Programming Lab

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	2	–	–	–	–	–	–	–	–	1	1
CO2	–	3	–	–	–	–	2	–	–	–	2	1
CO3	–	3	–	–	–	–	2	–	–	–	2	1
PO Target	–	2.6	–	–	–	–	2	–	–	–	1.6	1

MCA-II Semester

RCA 201
CBNST

	PO 1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	–	–	2	–	–	–	–	–	–	–
CO2	3	3	–	–	2	–	–	–	–	–	–	–
CO3	3	3	–	–	2	–	–	–	–	–	–	–
CO4	3	3	2	–	2	–	–	–	–	–	–	–
CO5	3	3	3	3	2	–	–	–	–	–	–	–
PO Target	3	3	2.5	3	2	–	–	–	–	–	–	–

RCA 202
Data Structures

	PO 1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	–	2	–	–	2	–	–	–	1	–
CO2	3	3	–	2	–	–	2	–	–	–	1	–
CO3	3	3	–	3	–	–	2	–	–	–	3	–
CO4	3	3	–	3	–	–	2	–	–	–	2	–
CO5	3	3	–	3	–	–	2	–	–	–	3	–
PO Target	3	3	–	2.6	–	–	2	–	–	–	2	–

RCA 203
Introduction to Automata Theory & Languages

	PO 1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	–	–	3	–	–	–	–	–	–	–
CO2	3	3	–	–	3	–	–	–	–	–	–	–
CO3	3	3	–	–		–	–	–	–	–	–	–
CO4	3	3	–	2	3	–	2	–	–	–	–	–
CO5	3	3	–	–	–	–	–	–	–	–	–	–
PO Target	3	3	–	2	3	–	2	–	–	–	–	–

RCA 204
Innovation and Entrepreneurship

	PO 1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	2	1	–	–	–	2	–	–	–	3	3
CO2	–	2	3	–	–	–	3	–	–	–	3	3
CO3	–	2	2	–	–	–		–	–	–	3	3
CO4	–	–	–	–	–	–	2	–	–	–	3	3
CO5	–	2	2	–	–	–	2	–	–	–	3	3
PO Target	–	2	2	–	–	–	2.2	–	–	–	3	3

RHU 001
Human Value and Professional Ethics

	PO 1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	–	–	–	–	2	–	–	–	–	–	–
CO2	–	–	–	–	–	1	–	–	–	2	1	–
CO3	–	–	–	–	–	1	–	–	–	2	–	–
CO4	–	–	–	–	–	1	–	–	–	–	–	–
CO5	–	–	–	–	–	3	–	–	–	3	1	–
PO Target	–	–	–	–	–	1.6	–	–	–	2.3	1	–

RCA-251
CBNST
Lab

	PO 1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	–	–	2	–	–	–	–	–	–	–
CO2	3	3	–	–	2	–	–	–	–	–	–	–
CO3	3	3	1	1	2	–	–	–	–	–	–	–
PO Target	3	3	1	1	2	–	–	–	–	–	–	–

RCA-252
Data Structure
Lab

	PO 1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	–	2	–	–	2	–	–	–	1	–
CO2	3	3	–	2	–	–	2	–	–	–	3	–
CO3	3	3	–	1	–	–	1	–	–	–	2	–
PO Target	3	3	–	1.6	–	–	1.6	–	–	–	2	–

MCA-III Semester

RCA 301
Operating Systems

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	–	–	–	–	–	–	–	–	–	–
CO2	–	–	–	2	–	–	–	–	–	–	–	–
CO3	3	2	–	–	–	–	–	–	–	–	–	–
CO4	2	–	–	–	–	–	–	–	–	–	–	–
CO5	3	1	–	–	–	–	–	–	–	–	–	–
Target PO	**2.7**	**1.6**	–	**2**	–	–	–	–	–	–	–	–

RCA 302
Web technology

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	1	1	–	–	–	1	–	–	1	2	–
CO2	–	–	2	–	3	–	3	–	–	2	2	–
CO3	–	–	–	–	3	–	3	–	–	–	2	2
CO4	–	–	–	–	3	–	3	–	–	–	3	2
CO5	–	–	–	–	3	–	3	–	–	–	3	2
Target PO	–	**1**	**1.5**	–	**3**	–	**2.6**	–	–	**1.5**	**2.4**	**2**

RCA 303
Design & Analysis of Algorithms

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	–	–	–	2	–	–	–	–	–
CO2	3	3	2	2	–	–		–	–	–	–	–
CO3	2	2	2	2	3	–	2	–	–	–	–	–
CO4	2	3	2	3	3	–	2	–	–	–	–	–
CO5	3	3	3	3	3	–	3	–	–	–	–	–
Target PO	**2.6**	**2.8**	**2.2**	**2.5**	**3**	–	**2.25**	–	–	–	–	–

RCA 304
Computer Based Optimization Techniques

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3		3	–	3	3	3	–	3	1
CO2	3	3	2	3	3	–	–	1	–	–	3	–
CO3	3	3	3	2	3	–	–	–	–	–	2	1
CO4	2	2	2	3	2	–	1	1	–	–	–	–
CO5	3	2	3	3	3	–	2	3	2	–	2	3
Target PO	**2.8**	**2.4**	**2.6**	**2.75**	**2.8**	–	**2**	**2**	**2.5**	–	**2.5**	**1.66667**

RCA 305
Cyber security

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	–	2	–	–	–	3	–	–	–	2	–
CO2	–	–	2	3	2	–	3	–	–	2	2	–
CO3	–	–	3	3	2	–	3	–	–	2	3	2
CO4	–	–	3	–	–	3	2	–	–	2	2	–
Target PO	–	–	**2.5**	**3**	**2**	**3**	**2.75**	–	–	**2**	**2.25**	**2**

RCA-351
Operating
Systems Lab

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	–	–	–	–	–	–	–	–	–	–	–
CO2	3	–	–	–	1	–	–	–	–	–	–	–
CO3	3	2	–	–	–	–	–	–	–	–	–	–
Target PO	**3**	**2**	–	–	**1**	–	–	–	–	–	–	–

RCA-352
Design and Analysis
Algorithm Lab

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	–	–	–	–	2	–	3	–	2	–
CO2	3	3	–	–	–	–	2	–	3	–	2	–
CO3	3	3	–	–	2	–	2	–	3	–	2	–
Target PO	**3**	**3**	–	–	**2**	–	**2**	–	**3**	–	**2**	–

RCA-A01
Introduction to Programming and Computer
Organization

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	–	–	2	–	–	2	–	–	–	–	–
CO2	2	–	–	–	–	–	–	–	–	–	–	–
CO3	2	–	–	–	–	–	–	–	–	–	–	–
CO4	2	3	–	–	3	–	2	–	–	–	–	1
Target PO	**2.25**	**3**	–	**2**	**3**	–	**2**	–	–	–	–	**1**

MCA-IV Semester

RCA- 401
Database Management System

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	–	–	–		–	–	–	–	–	–	–
CO2	2	3	–	–		–	2	–	–	–	–	–
CO3	–	3	–	–	2	–	2	–	2	–	–	–
CO4	–	2	–	–		–	3	–	–	–	–	–
CO5	–	–	–	–		–		–	–	–	–	–
Target PO	**2**	**2.6**	–	–	**2**	–	**2.3**	–	**2**	–	–	–

RCA- 402
Computer Networks

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	1	–	–	–	–	–	–	–	–	–	–
CO2	3	1	–	2	2	–	–	–	–	–	–	–
CO3	2	2	–	2	1	–	–	–	2	–	–	–
CO4	–	1	–	2	–	–	–	–	–	–	–	–
CO5	–	–	–	–	–	1	–	–	–	–	–	–
Target PO	**2.5**	**1.25**	–	**2**	**1.5**	**1**	–	–	**2**	–	–	–

RCA- 403
Artificial intelligence

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	1	–	–	–	–	–	–	–	–	–	–
CO2	2	3	2	–	–	–	–	–	–	–	–	–
CO3	3	–	–	–	–	2	–	–	–	–	–	–
CO4	–	3	1	3	2	–	–	–	–	–	–	–
CO5	–	3	3	3	3	–	–	–	–	–	–	–
Target PO	**2.5**	**2.5**	**2**	**3**	**2.5**	**2**	–	–	–	–	–	–

RCA- 404
Compiler Design

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	–	1	2	–	1	–	–	–	–	–
CO2	2	3	–	2	2	–	1	–	–	–	–	–
CO3	3	3	–	1	2	–	1	–	–	–	–	–
CO4	2	2	–	1	1	–	1	–	–	–	–	–
CO5	2	2	–	2	2	–	1	–	–	–	–	–
Target PO	**2.4**	**2.6**	–	**1.4**	**1.8**	–	**1**	–	–	–	–	–

RCA-E11
Design & Development of Applications

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	–	–	–	1	–	1	–	–	–	2	–
CO2	–	1	2	–	2	–	2	–	–	–	2	–
CO3	–	–	–	1	2	–	2	–	–	2	2	–
CO4	–	–	2	1	2	–	2	–	–	2	2	–
CO5	–	–	2	1	3	–	2	–	–	2	2	–
Target PO	–	**1**	**2**	**1**	**2**	–	**1.8**	–	–	**2**	**2**	–

RCA
A02:
Fundamental of Data Structure ,Numerical &
Computational Theory

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	3	–	–	1	–	2	–	–	–	–	–
CO2	3	1	–	–	2	–	–	–	–	–	–	–
CO3	3	2	–	–	3	–	–	–	–	–	–	–
Target PO	**2.3**	**2**	–	–	**2**	–	**2**	–	–	–	–	–

RCA-451
Mini Project
Lab

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	1	1	–	–	1	1	–	–	1	–
CO2	2	3	3	1	1	–	1	2	–	–	1	–
CO3	1	2	2	1	1	1	1	2	–	1	2	–
CO4	–	1	2	–	3	–	–	–	–	1	1	–
CO5	–	–	–	–	–	–	–	–	3	–		–
Target PO	**1.6**	**2.25**	**2**	**1**	**1.6**	**1**	**1**	**1.6**	**3**	**1**	**1.25**	–

RCA-452
Database Management System
Lab

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	2	–	–	–	–	2	–	–	–	–	–
CO2	–	3	–	–	2	–	2	–	1	–	–	–
CO3	–	2	–	–	–	–	2	–	–	–	–	–
Target PO	–	**2.3**	–	–	**2**	–	**2**	–	**1**	–	–	–

MCA-V Semester

RCA-501
Computer Graphics & Animation

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	1	–	1	–	–	–	–	–
CO2	3	3	1	1	1	–	1	–	–	–	–	–
CO3	3	3	2	2	1	–	1	–	–	–	–	–
CO4	3	3	1	2	2	–	1	–	–	–	–	1
CO5	1	1			1	–	1	–	–	–	–	2
Target PO	**2.6**	**2.6**	**1.25**	**1.5**	**1.2**	–	**1**	–	–	–	–	**1.5**

RCA-502
Software Engineering

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	–	3	1	1	–	–	–	–	–	–	1
CO2	–	–	–	2	2	2	1	–	3	–	–	–
CO3	–	3	3	2	2	2	2	–	3	–	–	–
CO4	–	2	–	3	3	2	2	–	3	–	–	1
CO5	–	–	–	3	2	2	3	3	2	3	3	–
Target PO	–	**2.5**	**3**	**2.2**	**2**	**2**	**2**	**3**	**2.75**	**3**	**3**	**1**

RCA-E31
Cloud Computing

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	–	–	–	1	2	2	–	–	–	–	3
CO2	–	–	–	–	3	2	3	–	–	–	–	3
CO3	–	–	2	–	3	2	3	–	–	–	–	3
CO4	–	–	2	–	2	2	3	–	–	1	–	–
CO5	–	–	–	–	3	3	1	–	–	2	–	–
Target PO	–	–	**2**	–	**2.4**	**2.2**	**2.4**	–	–	**1.5**	–	**3**

RCA-E24
Software Testing

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	2	–	–	1	2	2	–	3	2	2	–
CO2	–	–	–	–	3	–	2	–	3	–	2	–
CO3	–	–	–	–	3	–		–	1	–	2	–
CO4	–	–	–	–	3	–	3	–	3	–	2	–
CO5	–	–	–	–	3	–	1	–	1	–	2	–
Target PO	–	**2**	–	–	**2.6**	**2**	**2**	–	**2.2**	**2**	**2**	–

RCA-E45
Big Data

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	–	–	2	1	–	–	1	–	–	–	–
CO2	3	2	2	2	2	2	–	–	–	–	2	–
CO3	2	2	3	3	3	–	–	3	–	–	2	–
CO4	2	3	3	3	3	–	–	2	–	–	2	–
CO5	1		3	3	3	–	–	–	2	–	2	–
Target PO	**2.2**	**2.3**	**2.75**	**2.6**	**2.4**	**2**	–	**2**	**2**	–	**2**	–

RCA-551
Computer Graphics &
Animation Lab

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	–	2	–	2	–	–	–	1	–
CO2	3	2	1	–	2	–	2	–	–	–	1	–
CO3	3	2	1	3	3	–	3	–	–	–	3	2
Target PO	**3**	**2**	**1**	**3**	**2.3**	–	**2.3**	–	–	–	**1.6**	**2**

RCA-552
Project Based on Software Engineering

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	–	2	3	2	–	–	2	–	–	–	2	–
CO2	–	3	3	–	3	–	2	–	–	–	2	–
CO3	–	–	–	–	–	–	1	–	3	–	3	–
Target PO	–	**2.5**	**3**	**2**	**3**	–	**1.6**	–	**3**	–	**2.3**	–

MCA-VI Semester

RCA-611
Colloquium

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	–	3	–	3	3	–	2	–	3	–
CO2	–	2	–	–	2	2	3	–	3	–	3	–
CO3	3	2	–	3	–	–	2	–	3	–	2	–
Target PO	**3**	**2.3**	–	**3**	**2**	**2.5**	**2.6**	–	**2.6**	–	**2.6**	–

RCA-612
Industrial Project

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	–	–	3	–	–	2	1	–	2	–
CO2	3	2	2	3	2	–	2	–	–	–	1	–
CO3	3	3	2	–	3	2	–	–	–	–	2	–
CO4	3	–	3	–	3	–	–	–	3	–	3	–
CO5	1	2	1	1	1	2	3	–	1	1	1	–
Target PO	**2.6**	**2.5**	**2**	**2**	**2.4**	**2**	**2.5**	**2**	**1.6**	**1**	**1.8**	–