# Course Structure and Syllabus of the Framework

## 1. Proposed Course Structure of 2-year PG Programme of RSIT

### 1.1. Course Structure for 2-year MCA Programme Academic Year 2025-2026

| 1st semester | | | | | | | |
|---|---|---|---|---|---|---|---|
| **S.N** | **Subject Code** | **Names of subjects** | **L** | **T** | **P** | **C** | **TCP** |
| **Programme Specific Core Courses** | | | | | | | |
| 1 | | Mathematical Foundation for Computer Science | 3 | 0 | 0 | 3 | 3 |
| 2 | | Advanced Data Structures and Algorithms | 4 | 0 | 2 | 5 | 6 |
| 3 | | Database Management and Warehousing | 4 | 0 | 2 | 5 | 6 |
| **Programme Specific Elective Courses** | | | | | | | |
| 4 | | PSE I | 4 | 0 | 2 | 4 | 5 |
| **MOOCS** | | | | | | | |
| 5 | | One 8-Week Course from SWAYAM /MOOCS as per the Department Directives | 0 | 0 | 0 | 2 | 2 |
| | | **TOTAL** | **15** | **0** | **6** | **19** | **22** |
| **2nd semester** | | | | | | | |
| **S.N** | **Subject Code** | **Names of subjects** | **L** | **T** | **P** | **C** | **TCP** |
| **Programme Specific Core Courses** | | | | | | | |
| 1 | | Web Technology | 3 | 0 | 2 | 4 | 5 |
| | | System Administration | 3 | 0 | 2 | 4 | 4 |
| 2 | | Internet Protocols and Network Design | 3 | 0 | 2 | 4 | 6 |
| **Programme Specific Elective Courses** | | | | | | | |
| 3 | | PSE II | 3 | 0 | 2 | 4 | 5 |
| 4 | | PSE II | 3 | 0 | 2 | 4 | 5 |
| **MOOCS** | | | | | | | |
| | | One 8-Week Course from SWAYAM /MOOCS as per the Department Directives | **0** | **0** | **0** | **2** | **2** |
| | | **TOTAL** | **15** | **0** | **10** | **22** | **27** |
| **Exit Option after 1st Year: PG Diploma in Computer Application.<br>Additional Credits to be acquired: 4 (Internship/Apprenticeship)** | | | | | | | |
| **3rd semester** | | | | | | | |
| **S.N** | **Subject Code** | **Names of subjects** | **L** | **T** | **P** | **C** | **TCP** |
| **Programme Specific Core Courses** | | | | | | | |
| 1 | | Network Security and Cryptography | 3 | 0 | 2 | 5 | 5 |
| 2 | | Software Project Management | 3 | 0 | 2 | 5 | 5 |
| **MOOCS** | | | | | | | |
| 3 | | One 8-Week Course from SWAYAM /MOOCS as per the Department Directives | 0 | **0** | **0** | **2** | **2** |
| **Programme Specific Elective Courses** | | | | | | | |
| 4 | | PSE III | 3 | 0 | 2 | 4 | 5 |
| **Project** | | | | | | | |
| 5 | | Dissertation-I | 0 | 0 | 16 | 8 | 16 |
| | | **TOTAL** | **9** | **0** | **22** | **24** | **33** |

| 4th semester | | | | | | | |
|---|---|---|---|---|---|---|---|
| **S.N** | **Subject Code** | **Names of subjects** | **L** | **T** | **P** | **C** | **TCP** |
| **MOOCS** | | | | | | | |
| | | One 8-Week Course from SWAYAM /MOOCS as per the Department Directives | **2** | **0** | **0** | **2** | **2** |
| **Summer Training/ Internship/Project** | | | | | | | |
| 1 | | Industrial Summer Training | 0 | 0 | 0 | 18 | 36 |
| | | **TOTAL** | **2** | **0** | **0** | **20** | **38** |

| PSE Tracks | Subject Name |
|---|---|
| **Track 1: Artificial Intelligence** | PSE 1: Foundations of AI |
| | PSE 2: Machine Learning & Deep Learning |
| | PSE 3: Natural Language Processing |
| | PSE 4: Computer Vision |
| **Track 2: Data Analytics** | PSE 1: Data Mining |
| | PSE 2: Statistical Computing |
| | PSE 3: Big Data Analytics |
| | PSE 4: Cloud Computing for Big Data |
| **Track 3: Image Processing/ Computer Vision** | PSE 1: Digital Image Processing |
| | PSE 2: Machine Learning & Deep Learning |
| | PSE 3: Machine Processing of Remotely Sensed Images |
| | PSE 4: Computer Vision |

## 2. Detailed Course Structure

### 1.2 Proposed Course Structure of 2-year PG Programme of RSIT for 2025-2026

| 1st semester | | | | | | | |
|---|---|---|---|---|---|---|---|
| **S.N** | **Subject Code** | **Names of subjects** | **L** | **T** | **P** | **C** | **TCP** |
| **Programme Specific Core Courses** | | | | | | | |
| 1 | | Advanced Data Structures and Algorithms | 4 | 0 | 2 | 5 | 6 |
| 2 | | Artificial Intelligence | 4 | 0 | 0 | 4 | 4 |
| 3 | | Introduction to Data Analytics | 4 | 0 | 2 | 5 | 6 |
| **Programme Specific Elective Courses (PSE)** | | | | | | | |
| 4 | | DSE 1 | 3 | 0 | 2 | 4 | 4 |
| **MOOCS** | | | | | | | |
| 5 | | One 8-Week Course from SWAYAM /MOOCS as per the Department Directives | 0 | **0** | **0** | **2** | **2** |
| | | **TOTAL** | **15** | **0** | **6** | **20** | **22** |
| **2nd semester** | | | | | | | |
| **S.N** | **Subject Code** | **Names of subjects** | **L** | **T** | **P** | **C** | **TCP** |
| **Programme Specific Core Courses** | | | | | | | |
| 1 | | System Programming | 4 | 0 | 2 | 5 | 6 |
| 2 | | Digital Image Processing | 4 | 0 | 2 | 5 | 6 |
| **Programme Specific Elective Courses (PSE)** | | | | | | | |
| 3 | | DSE 2 | 3 | 0 | 2 | 4 | 5 |
| 4 | | DSE 3 | 3 | 0 | 2 | 4 | 5 |
| **MOOCS** | | | | | | | |
| 5 | | One 8-Week Course from SWAYAM /MOOCS as per the Department Directives | 0 | **0** | **0** | **2** | **2** |
| | | **TOTAL** | **14** | **0** | **8** | **20** | **24** |
| **Exit Option after 1st Year: PG Diploma in Computer Application/ Information Technology/ Cohort Course Additional Credits to be acquired: 4 (Internship/Apprenticeship)** | | | | | | | |

| 2nd Year PG Course Structure for 2-Year PG with Course Work + Research Work | | | | | | | |
|---|---|---|---|---|---|---|---|
| **3rd semester** | | | | | | | |
| **S.N** | **Subject Code** | **Names of subjects** | **L** | **T** | **P** | **C** | **TCP** |
| **Programme Specific Core Courses** | | | | | | | |
| 1 | | Wireless Communication Network | 4 | 0 | 2 | 5 | 6 |
| **Programme Specific Elective Courses (PSE)** | | | | | | | |
| 2 | | DSE IV | 3 | 0 | 2 | 4 | 5 |
| **Summer Training/ Internship** | | | | | | | |
| 3 | | Summer Training/ Internship | 0 | 0 | 0 | 3 | 6 |
| **Project** | | | | | | | |
| 4 | | Dissertation-I | 0 | 0 | 0 | 8 | 16 |
| | | **TOTAL** | **7** | **0** | **4** | **20** | **33** |
| **4th semester** | | | | | | | |
| **S.N** | **Subject Code** | **Names of subjects** | **L** | **T** | **P** | **C** | **TCP** |
| **MOOCS** | | | | | | | |
| **1** | | One 8-Week Course from SWAYAM /MOOCS as per the Department Directives | **0** | **0** | **0** | **2** | **2** |
| **Project** | | | | | | | |
| 2 | | Dissertation-II | 0 | 0 | 36 | 18 | 36 |
| | | **TOTAL** | **0** | **0** | **36** | **20** | **38** |
| **2nd Year PG Course Structure for 2 Year PG with Research Work Only** | | | | | | | |
| **3rd semester** | | | | | | | |
| **S.N** | **Subject Code** | **Names of subjects** | **L** | **T** | **P** | **C** | **TCP** |
| **MOOCS** | | | | | | | |
| **1** | | One 8-Week Course from SWAYAM /MOOCS Related to Dissertation -I | **0** | **0** | **0** | **2** | **2** |
| **Project** | | | | | | | |
| 2 | | Dissertation-I | 0 | 0 | 36 | 18 | 36 |
| | | **TOTAL** | **0** | **0** | **36** | **20** | **38** |
| **4th semester** | | | | | | | |

| S.N | Subject Code | Names of subjects | L | T | P | C | TCP |
|---|---|---|---|---|---|---|---|
| **MOOCS** | | | | | | | |
| **1** | | One 8-Week Course from SWAYAM /MOOCS Related to Dissertation -I | **2** | **0** | **0** | **2** | **2** |
| **Project** | | | | | | | |
| 1 | | Dissertation-II | 0 | 0 | 36 | 18 | 36 |
| | | **TOTAL** | **0** | **0** | **36** | **20** | **38** |
| **2nd Year PG Course Structure for 2 Year PG with Course Work Only** | | | | | | | |
| **3rd semester** | | | | | | | |
| **S.N** | **Subject Code** | **Names of subjects** | **L** | **T** | **P** | **C** | **TCP** |
| **Programme Specific Core Courses** | | | | | | | |
| 1 | | Wireless Communication Networks | 3 | 0 | 2 | 4 | 5 |
| 2 | | Soft Computing | 3 | 0 | 2 | 4 | 5 |
| **Programme Specific Elective Courses (PSE)** | | | | | | | |
| 3 | | PSE IV | 3 | 0 | 2 | 4 | 5 |
| 4 | | PSE V | 3 | 0 | 2 | 4 | 5 |
| **MOOCS** | | | | | | | |
| 5 | | One 8-Week Course from SWAYAM /MOOCS Related to Dissertation -I | **2** | **0** | **0** | **2** | **2** |
| **Summer Training/ Internship** | | | | | | | |
| 6 | | Summer Training/ Internship | 0 | 0 | 0 | 2 | 4 |
| | | **TOTAL** | **12** | **0** | **8** | **20** | **26** |

| **4th semester** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **S.N** | **Subject Code** | **Names of subjects** | **L** | **T** | **P** | **C** | **TCP** |
| **Programme Specific Core Courses** | | | | | | | |
| 1 | | Software Project Management | 3 | 0 | 2 | 4 | 5 |
| 2 | | Data Mining | 3 | 0 | 2 | 4 | 5 |
| **Department-Specific Elective Courses (DSE)** | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | | Minor VI | 3 | 0 | 2 | 4 | 5 |
| 4 | | Minor VII | 3 | 0 | 2 | 4 | 5 |
| **MOOCS** | | | | | | | |
| 5 | | One 8-Week Course from SWAYAM /MOOCS Related to Dissertation -I | 0 | **0** | **0** | **2** | **2** |
| **Summer Training/ Internship/Project** | | | | | | | |
| 6 | | Summer Training/ Internship | 0 | 0 | 0 | 2 | 4 |
| | | **TOTAL** | **12** | **0** | **8** | **20** | **26** |

| SEMESTER | TOTAL CREDITS |
|---|---|
| **I** | **20** |
| **II** | **20** |
| **III** | **20** |
| **IV** | **20** |
| **TOTAL** | **80** |

| LIST OF DEPARTMENT-SPECIFIC ELECTIVES | | | |
|---|---|---|---|
| **Elective No** | **Sl. No** | **Subject Code** | **Name of the Elective** |
| **PSE I** | 1 | INT054D101 | Web Development |
| | 2 | INT054D102 | App Development |
| | 3 | INT054D103 | UI /UX Design |
| **PSE II** | 1 | INT054D201 | Machine Learning & Deep Learning |
| | 2 | INT054D202 | Statistical Computing |
| | 3 | INT054D203 | Pattern Recognition |
| **PSE III** | 1 | INT054D201 | **Natural Language Processing** |
| | 2 | INT054D202 | Big Data Analytics |
| | 3 | INT054D203 | **Machine Processing of Remotely Sensed Images** |
| **PSE IV** | 1 | INT054D304 | Computer Vision |
| | 2 | INT054D305 | Cloud Computing |
| | 3 | INT054D306 | Biomedical Image Processing |
| **PSE V** | 1 | INT054D301 | Internet of Things |
| | 2 | INT054D302 | Fuzzy Logic |
| | 3 | INT054D303 | Quantum Computing |
| **PSE VI** | 1 | INT054D401 | Robotics |
| | 2 | INT054D402 | Bioinformatics |
| | 3 | INT054D403 | Cyber Forensics |
| **PSE VII** | 1 | INT054D401 | Large Language Model |
| | 2 | INT054D402 | Introduction to Soft computing |
| | 3 | INT054D403 | Blockchain Technologies |

## 2.1 Course Structure of BCA

# BCA Course Structure for the Session 2023-2024

| 1st Semester | | | | |
|---|---|---|---|---|
| **Sl. No.** | **Subject Code** | **Names of subjects** | **Level of Course** | **Credit** |
| **Major** | | | | |
| 1 | CAP052M101 | Discrete Structures | 100 | 3 |
| 2 | CAP052M102 | Introduction to C Programming | 100 | 3 |
| **Minor** | | | | |
| 3 | CAP052N101 | Fundamentals of Web Design (Offered to Others) | 100 | 3 |
| **Interdisciplinary** | | | | |
| 4 | IKS992K101 | Introduction to Indian Knowledge System-I | 100 | 3 |
| **Ability Enhancement Courses (AEC)** | | | | |
| 5 | AEC982A101 | Communicative English and Behavioural Science-I | 100 | 2 |
| **Skill Enhancement Courses (SEC)** | | | | |
| 6 | CAP052S101 | Windows Programming using C# | 100 | 3 |
| **Value Addition Courses (VAC)** | | | | |
| 7 | VAC-1 | Basket Course (Office Automation -RSIT) (List Offered by University) | 100 | 3 |
| | | **TOTAL** | | **20** |
| **2nd Semester** | | | | |
| **Sl. No.** | **Subject Code** | **Names of subjects** | **Level of Course** | **Credit** |
| **Major** | | | | |
| 1 | CAP052M201 | Data Structures | 100 | 3 |
| 2 | CAP052M202 | Computer Architecture | 100 | 3 |
| **Minor** | | | | |
| 3 | INT052N201 | Server-Side Programming ((Offered to Others ) | 100 | 3 |
| **Interdisciplinary** | | | | |
| 4 | IKS992K201 | Introduction to Indian Knowledge System-II | 100 | 3 |
| **Ability Enhancement Courses (AEC)** | | | | |
| 5 | AEC982A201 | Communicative English and Behavioural Science-II | 100 | 2 |
| **Skill Enhancement Courses (SEC)** | | | | |
| 6 | CAP052S201 | Computer Hardware and Networking | 100 | 3 |

| Value Addition Courses (VAC) | | | | |
|---|---|---|---|---|
| 7 | VAC992V2409 | Basket Course (Cybersecurity - RSIT) (List Offered by University) | 100 | 3 |
| | | **TOTAL** | **17** | **20** |
| **3rd Semester** | | | | |
| **Sl. No.** | **Subject Code** | **Names of subjects** | **Level of Course** | **Credit** |
| **Major** | | | | |
| 1 | CAP052M301 | Java Programming | 200 | 4 |
| 2 | CAP052M302 | Database Management Systems | 200 | 4 |
| **Minor** | | | | |
| 3 | INT052N301 | Front End Development with React (Offered to Others) | 200 | 4 |
| **Interdisciplinary** | | | | |
| 4 | INT052I301 | Introduction to Python (Offered to all by RSIT) | 200 | 3 |
| **Ability Enhancement Courses (AEC)** | | | | |
| 5 | CEN982A301<br><br>BHS982A302 | Communicative English III Fundamentals of Business Communication<br><br>Behavioural Science III | 200 | 1+1 |
| **Skill Enhancement Courses (SEC)** | | | | |
| 6 | CAP052S301 | SEC-3 (System Administration) | 200 | 3 |
| | | **TOTAL** | | **20** |
| **4th Semester** | | | | |
| **Sl. No.** | **Subject Code** | **Names of subjects** | **Level of Course** | **Credit** |
| **Major** | | | | |
| 1 | CAP052M401 | Operating Systems | 200 | 4 |
| 2 | CAP052M402 | Data Communication Networks | 200 | 4 |
| 3 | INT052M402 | Indian Mathematics in Computer Science | 200 | 4 |
| **Minor** | | | | |
| 4 | CAP052N401 | Front End Development with Angular (to be offered for other) | 200 | 3 |
| 5 | CAP052N402 | Server-Side Programming with Node JS | 200 | 3 |
| **Ability Enhancement Courses (AEC)** | | | | |
| 6 | AEC982A101 | Communicative English and Behavioural Science-IV | 200 | 2 |
| | | **TOTAL** | 20 | **20** |

| 5th Semester | | | | |
|---|---|---|---|---|
| **Sl. No.** | **Subject Code** | **Names of subjects** | **Level of Course** | **Credit** |
| **Major** | | | | |
| 1 | CAP052M501 | Web Technology | 300 | 4 |
| 2 | CAP052M502 | Python Programming | 300 | 4 |
| 3 | CAP052M503/ CAP052M504 | Foundation of Artificial Intelligence/ Statistical Computing | 300 | 4 |
| **Minor** | | | | |
| 4 | CAP052N501 | Web Integration and Application | 300 | 4 |
| **Internship** | | | | |
| 5 | CAP052I501 | Summer Internship | 300 | 4 |
| | | **TOTAL** | | **20** |

| 6th Semester | | | | |
|---|---|---|---|---|
| **Sl. No.** | **Subject Code** | **Names of subjects** | **Level of Course** | **Credit** |
| **Major** | | | | |
| 1 | CAP052M601 | Software Engineering | 300 | 4 |
| 2 | CAP052M602 | Cryptography and Network Security | 300 | 4 |
| 3 | CAP052M603/ CAP052M604 | Introduction to Machine learning /Introduction to Data science | 300 | 4 |
| 4 | CAP052M605/ CAP052M606 | Introduction to Deep Learning /Introduction to Big Data Analytics | 300 | 4 |
| **Minor** | | | | |
| 5 | CAP052N601 | Secure Web Development | 300 | 4 |
| | | **TOTAL** | | **20** |

| 7th Semester | | | | |
|---|---|---|---|---|
| **Sl. No.** | **Subject Code** | **Names of subjects (Suggested)** | **Level of Course** | **Credit** |
| **Major** | | | | |
| 1 | C-401 | Cloud Computing | 400 | 4 |
| 2 | C-402 | Data Mining and Data Warehousing | 400 | 4 |
| 3 | C-403 | Introduction to Natural Language Processing | 400 | 4 |
| 4 | C-404 | Wireless Communication Network | 400 | 4 |
| **Minor** | | | | |
| 5 | M-401 | Cloud-Based Web Development | 400 | 4 |
| | | **TOTAL** | **20** | **20** |
| **8th Semester** | | | | |
| **Sl. No.** | **Subject Code** | **Names of subjects (Suggested)** | **Level of Course** | **Credit** |
| **Major** | | | | |
| 1 | RM-301 | Soft Computing | 400 | 4 |
| **Minor** | | | | |
| 2 | M-402 | Web Page Ranking and Optimization | 400 | 4 |
| **Dissertation** | | | | |
| 3 | | Dissertation | 400 | 12 |
| **Advanced Level Core Course instead of Dissertation** | | | | |
| 4 | C-407 | Cyber Space and Cyber Security | 400 | 4 |
| 5 | C-408 | Blockchain Technologies | 400 | 4 |
| 6 | C-409 | Quantum Computing | 400 | 4 |
| | | **TOTAL** | | **20** |