

# Curriculum of B.Tech in Mathematics and Computing

## IIIT Raichur

| <b>Semester 1 (16 credits)</b> |                                  |                          |               |
|--------------------------------|----------------------------------|--------------------------|---------------|
| <i>Code</i>                    | <i>Course</i>                    | <i>Type of course</i>    | <i>Credit</i> |
| MA101                          | Mathematics I                    | MA Basic Sciences        | 3             |
| ID110                          | Introduction to programming      | Basic Engineering Skills | 3             |
| ID120                          | Digital Fabrication              | Departmental Core        | 2             |
| ID130                          | Digital Logic Design             | Departmental Core        | 1             |
| ID131                          | Digital systems Design           | Basic Engineering Skills | 1             |
| LAXxx                          | LA /CA Elective                  | LA elective course       | 2             |
| ID141                          | Introduction to AI and DS        | Basic Engineering course | 2             |
| CS101                          | Introduction to Computer science | Departmental Core course | 2             |
|                                | <b>Total</b>                     |                          | <b>16</b>     |

| <b>Semester 2 (16 credits)</b> |   |                          |               |
|--------------------------------|---|--------------------------|---------------|
| <i>Code</i>                    | <i>Course</i>                                 | <i>Type of course</i>    | <i>Credit</i> |
| MA102                          | Mathematics-II                                | MA Basic Sciences        | 3             |
| CS211                          | Introduction to Computational Sciences        | Basic Engineering course | 1             |
| EE121                          | Hardware Description Language                 | Departmental Core        | 2             |
| CS121                          | Discrete Mathematics                          | Departmental Core        | 3             |
| CS122                          | Introduction to Object Oriented Programming   | Departmental Core        | 4             |
| ID151                          | Independent Project                           | Basic Engineering Skills | 1             |
| ID161                          | Professional Communication skills and writing | Liberal Arts             | 2             |
|                                | <b>Total</b>                                  |                          | <b>16</b>     |

| <b>Semester 3 (17 credits)</b> |  |                          |               |
|--------------------------------|--|--------------------------|---------------|
| <i>Code</i>                    | <i>Course</i>                                  | <i>Type of course</i>    | <i>Credit</i> |
| CSxxx                          | Formal Languages and Automata Theory           | Departmental Core        | 3             |
| CS201                          | Data Structures and Applications               | Basic Engineering Skills | 4             |
| MCxxx                          | Group and Ring Theory                          | Departmental Core        | 3             |
| MCxxx                          | Introduction to Probability and Random Process | Departmental Core        | 3             |
| MA204                          | Number Theory                                  | Departmental Core        | 3             |
| CS231                          | Introduction to Python Programming             | Basic Engineering Skills | 1             |
|                                | <b>Total</b>                                   |                          | <b>17</b>     |

| <b>Semester 4 (18 credits)</b> |                                     |                       |               |
|--------------------------------|-------------------------------------|-----------------------|---------------|
| <i>Code</i>                    | <i>Course</i>                       | <i>Type of course</i> | <i>Credit</i> |
| MCxxx                          | Cryptography and its Applications   | Departmental Core     | 3             |
| CS261                          | Database Management Systems         | Departmental Core     | 3             |
| MCxxx                          | Real Analysis and Metric Spaces     | Departmental Core     | 3             |
| CS202                          | Design and Analysis of Algorithms   | Departmental Core     | 3             |
| MCxxx                          | Linear Algebra and its Applications | Departmental Core     | 3             |
| MCxxx                          | Introduction to Applied Statistics  | Basic Science         | 3             |
|                                | <b>Total</b>                        |                       | <b>18</b>     |

| <b>Semester 5 (18 credits)</b> |   |                          |               |
|--------------------------------|---|--------------------------|---------------|
| <i>Code</i>                    | <i>Course</i>                           | <i>Type of course</i>    | <i>Credit</i> |
| MCxxx                          | Linear Systems and Signal Processing    | Basic Engineering Skills | 3             |
| CSxxx                          | Operating Systems I                     | Basic Engineering Skills | 1             |
| MCxxx                          | Combinatorics                           | Departmental Core        | 3             |
| MCxxx                          | Numerical Analysis and Complex Variable | Departmental Core        | 3             |
| XXxxx                          | Free Elective 1                         | Free Elective            | 3             |
| MCxxx                          | Departmental Elective 1                 | MC Elective              | 3             |
| CSxxx                          | Introduction to Compilers               | Basic Engineering Skills | 2             |
|                                | <b>Total</b>                            |                          | <b>18</b>     |

| <b>Semester 6 (17 credits)</b> |  |                                     |               |
|--------------------------------|--|-------------------------------------|---------------|
| <i>Code</i>                    | <i>Course</i>                            | <i>Type of course</i>               | <i>Credit</i> |
| MAxxx                          | Numerical Linear Algebra                 | MA Core Course                      | 3             |
| MCxxx                          | Departmental Elective 2                  | MC Elective                         | 3             |
| XXxxx                          | Engineering Elective 1                   | Engineering Elective                | 3             |
| XXxxx                          | Free Elective 2                          | Free Elective                       | 3             |
| LAxxx                          | LA/CA Elective                           | Liberal Arts Elective/Creative Arts | 2             |
| MCxxx                          | Optimization                             | Departmental Core                   | 3             |
|                                | <i>Project optional (3 or 6 credits)</i> |                                     | <i>Credit</i> |
| MCxxx                          | Credited Research Project - I            |                                     | 3             |
| MCxxx                          | Industry Project                         |                                     | 6             |

| <b>Semester 7 (15 credits)</b> |                                     |                       |               |
|--------------------------------|-------------------------------------|-----------------------|---------------|
| <i>Code</i>                    | <i>Course</i>                       | <i>Type of course</i> | <i>Credit</i> |
| MCxxx                          | Functional Analysis                 | Departmental Core     | 3             |
| MAxxx                          | Financial Engineering Mathematics   | Departmental Core     | 3             |
| MCxxx                          | Departmental Elective 3             | MC Elective           | 3             |
| MAxxx                          | MA Elective                         | MA Elective           | 3             |
| XXxxx                          | Free Elective 3                     | Free Elective         | 3             |
|                                | <i>Project optional (3 credits)</i> |                       | <i>Credit</i> |
| MCxxx                          | Credited Research Project - II      |                       | 3             |

| <b>Semester 8 (9 credits)</b> |               |                               |               |
|-------------------------------|---------------|-------------------------------|---------------|
| <i>Code</i>                   | <i>Course</i> | <i>Type of course</i>         | <i>Credit</i> |
| MCxxx                         | Major Project | Departmental/Industry Project | 9             |
|                               |               |                               |               |
|                               |               |                               |               |
|                               |               |                               |               |
|                               |               |                               |               |
|                               |               |                               |               |

**B.Tech Mathematics and Computing curriculum credits distribution:**

| <b>Semester</b> | <b>Departmental Core + Electives</b> | <b>LA/CA Electives</b> | <b>Basic Science &amp; Basic Engineering Skills</b> | <b>Free Electives</b> | <b>Total credits</b> |
|-----------------|--------------------------------------|------------------------|---|-----------------------|----------------------|
| 1               | 5                                    | 2                      | 9   | 0                     | 16                   |
| 2               | 9                                    | 2                      | 5   | 0                     | 16                   |
| 3               | 12                                   | 0                      | 5   | 0                     | 17                   |
| 4               | 15                                   | 0                      | 3   | 0                     | 18                   |
| 5               | 9                                    | 0                      | 6   | 3                     | 18                   |
| 6               | 9                                    | 2                      | 3   | 3                     | 17                   |
| 7               | 12                                   | 0                      | 0   | 3                     | 15                   |
| 8               | 9                                    | 0                      | 0   | 0                     | 9                    |
| <b>Total</b>    | <b>80</b>                            | <b>6</b>               | <b>31</b>   | <b>9</b>              | <b>126</b>           |

| <b>Split-up of 126 credits</b>                           | <b>Credits range</b> | <b>Credits</b> |
|--|----------------------|----------------|
| Approx. 20-25% Basic Sciences & Basic Engineering Skills | 25 - 31              | 31             |
| Approx. 62-65% Departmental subjects                     | 79 - 82              | 80             |
| Approx. 5-7% Liberal/Creative Arts                       | 6 - 9                | 6              |
| Approx. 7% Free electives                                | 9-12                 | 9              |
|  |                      | <b>126</b>     |