

# Syllabus Index

Name of the Major: **Mathematics**

## Semester 1

| Course Code      | Title of the Course                      | Type of the Course<br>DSC, MDC, SEC etc. | Credit | Hours/<br>Week | Hour Distribution /week |   |   |   |
|------------------|--|--|--------|----------------|-------------------------|---|---|---|
|                  |  |  |        |                | L                       | T | P | O |
| MG1DS<br>CMAT100 | Ground Roots of Mathematics              | DSC A                                    | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG1MD<br>CMAT100 | Mathematics for Competitive Examinations | MDC                                      | 3      | 4              | 2                       | 0 | 2 | 0 |

## Semester 2

| Course Code      | Title of the Course      | Type of the Course<br>DSC, MDC, SEC etc. | Credit | Hours /<br>Week | Hour Distribution /week |   |   |   |
|------------------|--------------------------|--|--------|-----------------|-------------------------|---|---|---|
|                  |                          |  |        |                 | L                       | T | P | O |
| MG2DSC<br>MAT100 | A Gateway to Mathematics | DSC A                                    | 4      | 5               | 3                       | 0 | 2 | 0 |
| MG2MD<br>CMAT100 | Applicable Mathematics   | MDC                                      | 3      | 4               | 2                       | 0 | 2 | 0 |

### Semester 3

| Course Code          | Title of the Course  | Type of the Course<br>DSC, MDC, SEC etc. | Credit | Hours/<br>Week | Hour Distribution /week |   |   |   |
|----------------------|--|--|--------|----------------|-------------------------|---|---|---|
|                      |  |  |        |                | L                       | T | P | O |
| MG3DS<br>CMAT20<br>0 | Perspectives of Mathematics  | DSC A                                    | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG3DS<br>CMAT20<br>1 | Building Blocks for Higher Mathematics   | DSC A                                    | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG3DS<br>EMAT20<br>0 | An Invitation to Actuarial Mathematics   | DSE*                                     | 4      | 4              | 4                       | 0 | 0 | 0 |
| MG3DS<br>EMAT20<br>1 | Game Theory and Project Management   |  | 4      | 4              | 4                       | 0 | 0 | 0 |
| MG3DS<br>EMAT20<br>2 | Numerical Methods  |  | 4      | 4              | 4                       | 0 | 0 | 0 |
| MG3DS<br>CMAT20<br>2 | Essential Mathematics for Science ( for BSc (Physics, Chemistry, Geology, Statistics)] | DSC B                                    | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG3DS<br>CMAT20<br>3 | Mathematics for Electronics (for B.Sc. Electronics)                                    | DSC B                                    | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG3DS<br>CMAT20<br>4 | Mathematics for Business and Economics (for B. A. Economics and B. Com.)               | DSC B                                    | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG3DS<br>CMAT20<br>5 | Essential Mathematics for Computing (for B. Sc. Computer Science)                      | DSC B                                    | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG3MD<br>CMAT20<br>0 | Mathematics of Nature and Art  | MDC                                      | 3      | 3              | 3                       | 0 | 0 | 0 |

|                      |  |            |          |          |          |          |          |          |
|----------------------|--|------------|----------|----------|----------|----------|----------|----------|
| MG3VA<br>CMAT20<br>0 | <b>Mastering Problem<br/>Solving through Vedic<br/>Mathematics</b> | <b>VAC</b> | <b>3</b> | <b>3</b> | <b>3</b> | <b>0</b> | <b>0</b> | <b>0</b> |
|----------------------|--|------------|----------|----------|----------|----------|----------|----------|

\* Opt any one from DSE



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## Semester 4

| Course Code      | Title of the Course  | Type of the Course<br>DSC, MDC, SEC etc. | Credit | Hours/<br>Week | Hour Distribution /week |   |   |   |
|------------------|--|--|--------|----------------|-------------------------|---|---|---|
|                  |  |  |        |                | L                       | T | P | O |
| MG4DS<br>CMAT200 | Matrix Algebra and Number Theory   | DSC A                                    | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG4DS<br>CMAT201 | Fundamentals of Analysis   | DSC A                                    | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG4DS<br>EMAT200 | Mathematical Modelling   | DSE*                                     | 4      | 4              | 4                       | 0 | 0 | 0 |
| MG4DS<br>EMAT201 | Transforms and Fourier Series  |  | 4      | 4              | 4                       | 0 | 0 | 0 |
| MG4DS<br>EMAT202 | Operations Research  |  | 4      | 4              | 4                       | 0 | 0 | 0 |
| MG4DS<br>CMAT202 | Essential Mathematics for Science ( for BSc Physics, Chemistry, Geology, Statistics) | DSC C                                    | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG4DS<br>CMAT203 | Mathematics for Electronics (for B.Sc. Electronics)                                  | DSC C                                    | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG4DS<br>CMAT204 | Mathematics for Business and Economics (for B. A. Economics and B. Com.)             | DSC C                                    | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG4DS<br>CMAT205 | Essential Mathematics for Computing (for B. Sc. Computer Science)                    | DSC C                                    | 4      | 5              | 3                       | 0 | 2 | 0 |

|                  |   |            |          |          |          |          |          |          |
|------------------|---|------------|----------|----------|----------|----------|----------|----------|
| MG4VA<br>CMAT200 | <b>Business Mathematics</b>                 | <b>VAC</b> | <b>3</b> | <b>3</b> | <b>3</b> | <b>0</b> | <b>0</b> | <b>0</b> |
| MG4SE<br>CMAT200 | <b>Document Preparation<br/>using LaTeX</b> | <b>SEC</b> | <b>3</b> | <b>3</b> | <b>3</b> | <b>0</b> | <b>0</b> | <b>0</b> |
| MG4INT<br>MAT200 | <b>Internship</b>                           | <b>INT</b> |          |          |          |          |          |          |

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## Semester 5

| Course Code          | Title of the Course                                       | Type of the Course<br>DSC, MDC, SEC etc. | Credit | Hours/<br>Week | Hour Distribution /week |   |   |   |
|----------------------|---|--|--------|----------------|-------------------------|---|---|---|
|                      |   |  |        |                | L                       | T | P | O |
| MG5DS<br>CMAT30<br>0 | A First Course in<br>Complex Analysis                     | DSC A                                    | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG5DS<br>CMAT30<br>1 | Limits and Convergence                                    | DSC A                                    | 4      | 4              | 4                       | 0 | 0 | 0 |
| MG5DS<br>CMAT30<br>2 | Fundamentals of Groups<br>and Rings                       | DSC A                                    | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG5DS<br>EMAT30<br>0 | Differential Equations<br>and Applications                | DSE                                      | 4      | 4              | 4                       | 0 | 0 | 0 |
| MG5DS<br>EMAT30<br>1 | Mathematical Musings<br>beyond Classroom                  | DSE*                                     | 4      | 4              | 4                       | 0 | 0 | 0 |
| MG5DS<br>EMAT30<br>2 | An Invitation to Fuzzy<br>Mathematics                     |  | 4      | 4              | 4                       | 0 | 0 | 0 |
| MG5DS<br>EMAT30<br>3 | Exploring the Harmony<br>of Automata                      |  | 4      | 4              | 4                       | 0 | 0 | 0 |
| MG5SE<br>CMAT30<br>0 | Introduction to Python<br>for Mathematical<br>Computation | SEC                                      | 3      | 3              | 3                       | 0 | 0 | 0 |

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## Semester 6

| Course Code      | Title of the Course                                   | Type of the Course<br>DSC, MDC, SEC etc. | Credit | Hours/<br>Week | Hour Distribution /week |   |   |   |
|------------------|---|--|--------|----------------|-------------------------|---|---|---|
|                  |   |  |        |                | L                       | T | P | O |
| MG6DS<br>CMAT300 | Mathematical Analysis                                 | DSC A                                    | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG6DS<br>CMAT301 | Fundamentals of Linear Algebra                        | DSC A                                    | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG6DS<br>EMAT300 | Application of Calculus and Linear Algebra in Finance | DSE                                      | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG6DS<br>EMAT301 | Investment Science                                    | DSE*                                     | 4      | 4              | 4                       | 0 | 0 | 0 |
| MG6DS<br>EMAT302 | Combinatorics   |  | 4      | 4              | 4                       | 0 | 0 | 0 |
| MG6DS<br>EMAT303 | Fundamentals of Fluid Dynamics                        |  | 4      | 4              | 4                       | 0 | 0 | 0 |
| MG6DS<br>EMAT304 | Scilab for Calculations and Visual Presentations      |  | 4      | 4              | 4                       | 0 | 0 | 0 |
| MG6VA<br>CMAT300 | Mathematical Computation and Visualization with R     | VAC                                      | 3      | 3              | 3                       | 0 | 0 | 0 |
| MG6SE<br>CMAT300 | Computations and Graphics using Sage Math             | SEC                                      | 3      | 3              | 3                       | 0 | 0 | 0 |

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## Semester 7

| Course Code          | Title of the Course                        | Type of the Course<br>DSC, MDC, SEC etc. | Credit   | Hours/<br>Week | Hour Distribution /week |          |          |          |
|----------------------|--|--|----------|----------------|-------------------------|----------|----------|----------|
|                      |  |  |          |                | L                       | T        | P        | O        |
| MG7DC<br>CMAT40<br>0 | <b>Advanced Linear Algebra</b>             | <b>DCC</b>                               | <b>4</b> | <b>5</b>       | <b>3</b>                | <b>0</b> | <b>2</b> | <b>0</b> |
| MG7DC<br>CMAT40<br>1 | <b>Theory of Complex Functions</b>         | <b>DCC</b>                               | <b>4</b> | <b>4</b>       | <b>4</b>                | <b>0</b> | <b>0</b> | <b>0</b> |
| MG7DC<br>CMAT40<br>2 | <b>Introduction to Metric Spaces</b>       | <b>DCC</b>                               | <b>4</b> | <b>4</b>       | <b>4</b>                | <b>0</b> | <b>0</b> | <b>0</b> |
| MG7DC<br>EMAT40<br>0 | <b>Advanced Theory of Groups and Rings</b> | <b>DCE</b>                               | <b>4</b> | <b>4</b>       | <b>4</b>                | <b>0</b> | <b>0</b> | <b>0</b> |
| MG7DC<br>EMAT40<br>1 | <b>Real Analysis</b>                       | <b>DCE</b>                               | <b>4</b> | <b>4</b>       | <b>4</b>                | <b>0</b> | <b>0</b> | <b>0</b> |
| MG7DC<br>EMAT40<br>2 | <b>Graph Theory</b>                        | <b>DCE</b>                               | <b>4</b> | <b>4</b>       | <b>4</b>                | <b>0</b> | <b>0</b> | <b>0</b> |

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## Semester 8

| Course Code      | Title of the Course            | Type of the Course<br>DSC, MDC, SEC etc. | Credit | Hours/<br>Week | Hour Distribution /week |   |   |   |
|------------------|--------------------------------|--|--------|----------------|-------------------------|---|---|---|
|                  |                                |  |        |                | L                       | T | P | O |
| MG8DC<br>CMAT400 | Functional Analysis            | DCC                                      | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG8DC<br>CMAT401 | Measure Theory and Integration | DCC                                      | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG8DC<br>EMAT400 | Basic Topology                 | DCE                                      | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG8DC<br>EMAT401 | Field Theory                   | DCE                                      | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG8DC<br>EMAT402 | Optimization Techniques        | DCE                                      | 4      | 5              | 3                       | 0 | 2 | 0 |
| MG8PRJ<br>MAT400 | Project<br>(Research /Honours) |  | 12     |                |                         |   |   |   |

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**L — Lecture, T — Tutorial, P — Practical/Practicum , O — Others**