



Dr. Prasad B. Rampure M.E., Ph.D
REGISTRAR

Phone: (0831) 2498131
 Fax: (0831) 2498134

REF: VTU/BGM/MATDIP/1055/2025-26/ 3217

DATE:

18 SEP 2026

NOTIFICATION

Subject: Assessment Structure-CIE of MATDIP courses – Reg.
Reference: Proceeding of the meeting held on 22.06.2026
 Proceeding of the meeting held on 15.07.2026
 2.2.1 proceeding of 189th EC meeting held on 02.06.2026
 Dean Faculty of Engineering approval dated 19.07.2026

With reference to the subject and references cited above, all concerned faculty members and students are hereby informed that the following assessment structure and guidelines shall be followed for the Non-Credit Mandatory Courses (NCMC)-1BMATDIP310/410.

Assessment Structure for 1BMATDIP310/410 [Non-Credit Mandatory Courses (NCMC)]

For the Non-Credit Mandatory Courses offered by the Department of Mathematics, the Continuous Internal Evaluation (CIE) shall be conducted in offline or online mode.

1. Offering of Courses 1BMATDIP301 and 1BMATDIP401 through Offline mode: offered by the Department of Mathematics, the Continuous Internal Evaluation (CIE) shall be conducted by the concerned Mathematics teacher of the department.

The CIE shall carry **100 marks** and may comprise one or more of the following components:

Internal test, Assignments, Quizzes, etc, academic activities, as decided by the concerned course teacher.

The distribution of marks among the various assessment components shall be decided by the concerned course teacher. The faculty member shall upload the CIE marks to the VTU web portal as and when notified by the University.

2. Offering of Courses 1BMATDIP301 and 1BMATDIP401 through Online Mode: The lecture sessions for courses 1BMATDIP301 and 1BMATDIP401 shall also be made available through the vtu.online.ac.in platform. (refer Annexure-I)

The following guidelines shall be followed for offering these courses in online mode:

- If all the students admitted to the third and fourth semesters of a college opt to pursue these courses in the online mode, the courses shall be offered entirely through the <https://elearning.vtu.ac.in>. In such cases, the Centre for Distance and Online Education, Mysuru, shall conduct the Continuous Internal Evaluation (CIE) for **100 marks** and submit the CIE marks to the University, with a copy to the concerned college.
 - Within a college or department, all students admitted to the concerned semester shall follow a uniform mode of instruction for these courses. A combination of online and offline modes within the same batch shall **not be permitted**.
 - Any college intending to offer these courses in the online mode shall submit the list of eligible students to the Registrar, Visvesvaraya Technological University (VTU), Belagavi, for prior approval. Students shall be permitted to enrol for the online courses through the <https://elearning.vtu.ac.in> platform only after approval is accorded by the University.
- 3. Passing Requirement:** A student shall be declared to have successfully completed the Non-Credit Mandatory Course provided the student secures a minimum of 40 marks out of 100 in the Continuous Internal Evaluation (CIE) conducted either in the offline mode or through the online mode, as applicable.

4. **Class Hours per week:** During the initial meetings of the BoS/subject experts, it was recommended that the mathematics course for Lateral Entry students be offered for 3 hours per week to adequately cover the required topics. However, in some uploaded schemes, the course is shown as 12 hours in total (1 hour per week). Please note that the prescribed teaching hours are **3 hours** per week to ensure proper coverage of the required mathematical topics. The correction has been incorporated in the UG 2025 Scheme template uploaded under the UG Scheme category on the VTU website.

Paul/15/09/26
REGISTRAR

To,

The principals of affiliated (Constituent, Non-autonomous and autonomous) engineering colleges under the ambit of the university.

The Chairpersons/Programme coordinator of university departments at Bengaluru, Belagavi, Kalaburgi, Mysuru and Talkal

Copy to.

1. To the Hon'ble Vice-Chancellor, through the Secretary to the VC, VTU Belagavi, for information
2. The Registrar (Evaluation), VTU Belagavi, for information and the needful.
3. The Director ITI SMU, VTU Belagavi, for information and to make arrangements to upload on the VTU web portal.
4. The Director CDOL, Regional Office, Mysuru for information and needful
5. The Special Officer, Registrar office VTU Belagavi for information.
6. The Special Officer QPDS section VTU Belagavi for the information and needful (with a copy to Mr.P. Manjunath)
7. Office copy.

Annexure-I

Accessing of e-contents for BMATDIP310 – Additional Mathematics - 1 and BMATDIP410 – Additional Mathematics - 2 courses

Method 1: Via VTU e-Learning Portal (recommended starting point)

1. Open a web browser and go to the VTU e-Learning portal: <https://elearning.vtu.ac.in>
2. On the homepage, look for the Quick links / header section or the e-Content Repository option (or a quickbar/menu item related to Mathematics or e-Content).
3. Click the link for e-Content Repository. This typically redirects to <https://econtent.vtu.ac.in>
4. On the e-Content Repository page: Use the search box and type BMATDIP310 or Additional Mathematics - 1 (or BMATDIP410 / Additional Mathematics - 2). Alternatively, browse under the Mathematics branch / category.
5. Select the relevant course. The video lectures / e-contents should appear as modules or playable videos. You can watch them online or download (right-click on the video player and choose "Save video as" if the option is available, usually in MP4 format).

Method 2: Direct access to e-Content Repository

1. Go directly to <https://econtent.vtu.ac.in>
2. Search for: BMATDIP310 or Additional Mathematics - 1, or BMATDIP410 or Additional Mathematics - 2 / Additional Mathematics.
3. You can also navigate via the mathematics branch/category listing.
4. Open the course and access the video contents

The Syllabus of 1BMATDIP310 and 1BMATDIP410 is made available

@

<https://vtu.ac.in/pdf/2025commsyll3to8/1BMATDIP310.pdf>

<https://vtu.ac.in/pdf/2025commsyll3to8/1BMATDIP410.pdf>

III Semester

Course Title:	Additional Mathematics -I (Common to all Branches)		
Course Code:	1BMATDIP310	CIE Marks	50
Course Type (Theory/ Practical/Integrated):	NCMC	MCQ online exam Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	3:0:0:0	Exam Hours	-
Total Hours of Pedagogy	42 hours Theory	Credits	00 (PP)

Course objectives (COS): The goal of the course **Additional Mathematics -I (Common to all Branches) 1BMATDIP310** is to

CO1: Provide the requisite and relevant background necessary to understand the other important engineering mathematics courses offered for Engineers and Scientists

CO2: Apply the knowledge of the co-ordinate system to analyze the polar co-ordinate system.

CO3: Familiarize the importance of calculus associated with one variable and multivariable for all branches of the engineering.

CO4: Analyze the importance of the integral calculus and their application to real-world problems.

CO5: Emphasize the knowledge of the vector calculus to all branches of engineering.

CO6: Develop the knowledge of Linear Algebra to solve the system of equations.

Module-1: Polar Curves and Curvature (8 hours)

Polar coordinates, Polar curves, angle between the radius vector and the tangent, angle between two curves. Pedal equations. Indeterminate forms: L'Hospital's rule ($\frac{\infty}{\infty}, \infty - \infty, 0^0, 1^\infty$).

(RBT Levels: L1, L2 and L3)

Module-2: Partial Differentiation (9 hours)

Introduction: Partial derivatives, total derivative - differentiation of composite functions, Jacobian and problems.

Taylor's and Maclaurin's series expansion for one variable (Statement only) - problems

(RBT Levels: L1, L2 and L3)

Module-3: Integral Calculus (9 hours)

Statement of reduction formulae for $\sin^n(x)$, $\cos^n(x)$ and $\sin^m(x)\cos^n(x)$ and illustrative problems. Evaluation of double integrals and triple integrals-Simple examples.

Applications: Area of the region.

(RBT Levels: L1, L2 and L3)

Module-4: Vector Calculus (8 hours)

Differentiation of vector functions: Velocity and acceleration of a particle moving on a space curve. Scalar and vector point functions. Gradient, Divergence and Curl, Solenoidal and irrotational vector fields-Problems.

(RBT Levels: L1, L2 and L3)

Module-5: Linear Algebra (8 hours)

Introduction to linear algebra:

Elementary row transformation of a matrix, Rank of a matrix. Consistency and Solution of system of linear equations - Gauss-elimination method, Gauss Siedel method. Eigenvalues and Eigenvectors (2×2).

(RBT Levels: L1, L2 and L3).

Suggested Learning**Resources Textbooks:**

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 44th Ed., 2021
2. Gilbert Strang, Linear Algebra and its Applications, Cengage Publications, 4th Ed., 2022.
3. Erwin Kreyszig . Advanced Engineering Mathematics, wiley

Reference Books:

1. H K Das and Rajaneesh Varma, Higher Engineering Mathematics, S. Chand.
2. B. V. Ramana, Higher Engineering Mathematics, McGraw Hill.
3. Mangey Ram, Mathematics in Engineering Sciences, CRC Press
4. N. P. Bali, Manish Goyal - A Textbook of Engineering Mathematics, Laxmi Publications
5. David Poole, Linear Algebra, Cengage Learning India Pvt Ltd.

Web links and e-Resources:

- NPTEL (National Programme on Technology Enhanced Learning) – Mathematics:
<https://nptel.ac.in/>.
- SWAYAM learning modules on Engineering mathematics .
- <https://www.coursera.org/> Mathematics for Engineering Specialization

Teaching-Learning Process (Innovative Delivery Methods):

The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching-learning process and facilitate the achievement of course outcomes.

Suggested Innovative Delivery Methods may include (but are not limited to):

- Flipped Classroom
- Problem-Based Learning (PBL)
- Case-Based Teaching
- ICT-Enabled Teaching.

Assessment Structure:

For courses offered by the Department of Mathematics, the **Continuous Internal Evaluation (CIE)** shall be conducted by the concerned course teacher. The CIE may comprise tests, assignments, quizzes, seminars, or other academic activities, as decided by the concerned teacher. The distribution of marks among these activities shall be determined by the course teacher. The total marks awarded for all CIE activities shall be **100 marks**.

The concerned teacher shall upload the CIE marks to the VTU web portal whenever notified by the University.

Online Mode of Offering for 1BMATDIP301 and 1BMATDIP401

The lecture sessions for 1BMATDIP301 and 1BMATDIP401 shall also be made available through the **vtu.online.ac.in** platform.

1. If all the students admitted to the 3rd and 4th semesters of a college opt to pursue these courses in online

mode, the entire course shall be offered online. In such cases, the Centre for Online Education, Mysuru shall conduct the **Continuous Internal Evaluation (CIE)** for **100 marks** and submit the CIE marks to the University, with a copy to the concerned college.

2. Within the **same college/department**, all admitted students shall follow a single mode of learning for these courses. A situation where a part of the students opts for the online mode and the remaining students opt for the offline mode **shall not be permitted**.
3. A college intending to offer these courses through the online mode shall submit the **list of eligible students** to the Registrar, Visvesvaraya Technological University (VTU), Belagavi, for approval. Only after obtaining the approval of the University shall the students be permitted to enrol for the online course through the vtu.online.ac.in platform.

Notwithstanding the above, a student is considered to have **passed the course**, provided the total of **CIE online** examination is at least 40 out of 100 marks.

IV Semester

Course Title:	Additional Mathematics -II (Common to all Branches)		
Course Code:	1BMATDIP410	CIE Marks	50
Course Type (Theory/Practical/Integrated)	NCMC	MCQ online exam Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	3:0:0:0	Exam Hours	-
Total Hours of Pedagogy	42 hours Theory	Credits	0

Course objectives: The goal of the course **Additional Mathematics -II (Common to all branches) 1BMATDIP410** is to

- CO-1:** Provide the requisite and relevant background necessary to understand the other important engineering mathematics courses offered for the Engineers and Scientists.
- CO-2:** Familiarize the importance of calculus associated with higher order differential equation with constant coefficients for all branches of the engineering.
- CO-3:** Apply the knowledge to find nonlinear differential equations and their respective solutions.
- CO-4:** Develop the knowledge of numerical methods to solve equations.
- CO-5:** Analyze the numerical methods by applying Ordinary Differential Equations.
- CO-6:** Understand and explain basic probability concepts.

Module-1: Ordinary Differential Equations (9 hours)

Higher order ODE's: Linear differential equations of second and higher order equations with constant coefficients. Homogeneous and non-homogeneous equations. Inverse differential operators e^{ax} , $\sin(bx+c)$, $\cos(bx+c)$ and polynomials. Solutions to the initial value problems. (RBT Levels: L1, L2 and L3)

Module-2: Non-linear differential equations (8 hours)

Non-linear differential equations: Introduction to general and singular solutions, solvable for p. Clairaut's equations, reducible to Clairaut's equations. (RBT Levels: L1, L2 and L3)

Module-3: Numerical methods-1 (9 hours)

Introduction to the numerical methods (All formulae without proof): Finite differences, Problems on Interpolation using Newton's forward and backward difference formulae, Newton's divided difference formula and Lagrange's interpolation formula.

Numerical integration: Problems on Trapezoidal, Simpson's $(1/3)^{rd}$ and Simpson's $(3/8)^{th}$ rules. (RBT Levels: L1, L2 and L3).

Module-4: Numerical Methods-2 (8 hours)

Solutions of algebraic and transcendental equations: Problems on Regula-Falsi and Newton-Raphson methods (only formulae).

Numerical Solution of Ordinary Differential Equations (ODE's): Numerical solution of ordinary differential equations of first order and first degree - Taylor's series method, Modified Euler's method, Runge-Kutta method of fourth order (No derivations) and problems.

(RBT Levels: L1, L2 and L3)

Module-5: Probability (8 hours)

Probability: Introduction. Sample space and events. Axioms of probability. Addition and multiplication theorems. Conditional probability – illustrative examples. Bayes's theorem examples.

(RBT Levels: L1, L2 and L3)

Suggested Learning Resources

Textbooks:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 44th Ed., 2021
2. M.K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Publishers, 8th Ed., 2022.

Reference Books:

1. H K Das and Rajaneesh Varma, Higher Engineering Mathematics, S. Chand.
2. B. V. Ramana Higher Engineering Mathematics, McGraw Hill.
3. Mangey Ram, Mathematics in Engineering Sciences, CRC Press
4. N. P. Bali, Manish Goyal - A Textbook of Engineering Mathematics, Laxmi Publications
5. Erwin Kreyszig. Advanced Engineering Mathematics, Wiley.

Web links and e-Resources:

- NPTEL (National Programme on Technology Enhanced Learning) – Mathematics:
<https://nptel.ac.in/>.
- SWAYAM learning modules on Engineering mathematics .
- <https://www.coursera.org/> Mathematics for Engineering Specialization.

Teaching-Learning Process (Innovative Delivery Methods):

The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching-learning process and facilitate the achievement of course outcomes.

Suggested Innovative Delivery Methods may include (but are not limited to):

- Flipped Classroom
- Problem-Based Learning (PBL)
- Case-Based Teaching
- ICT-Enabled Teaching.

Assessment Structure:

For courses offered by the Department of Mathematics, the **Continuous Internal Evaluation (CIE)** shall be conducted by the concerned course teacher. The CIE may comprise tests, assignments, quizzes, seminars, or other academic activities, as decided by the concerned teacher. The distribution of marks among these activities shall be determined by the course teacher. The total marks awarded for all CIE activities shall be **100 marks**.

The concerned teacher shall upload the CIE marks to the VTU web portal whenever notified by the University.

Online Mode of Offering for 1BMATDIP301 and 1BMATDIP401

The lecture sessions for 1BMATDIP301 and 1BMATDIP401 shall also be made available through the vtu.online.ac.in platform.

1. If all the students admitted to the 3rd and 4th semesters of a college opt to pursue these courses in online mode, the entire course shall be offered online. In such cases, the Centre for Online Education, Mysuru shall conduct the **Continuous Internal Evaluation (CIE)** for **100 marks** and submit the CIE marks to the

University, with a copy to the concerned college.

2. Within the **same college/department**, all admitted students shall follow a single mode of learning for these courses. A situation where a part of the students opts for the online mode and the remaining students opt for the offline mode **shall not be permitted**.
3. A college intending to offer these courses through the online mode shall submit the **list of eligible students** to the Registrar, Visvesvaraya Technological University (VTU), Belagavi, for approval. Only after obtaining the approval of the University shall the students be permitted to enrol for the online course through the vtu.online.ac.in platform.

Notwithstanding the above, a student is considered to have **passed the course**, provided the total of **CIE online** examination is at least 40 out of 100 marks.