# Sir M.Visvesvaraya Institute of Technology

Bengaluru - 562157

Approved by AICTE | Affiliated to VTU Belagavi | Accredited by NAAC

## Department of Mathematics

# Course File

Name of the Faculty : SHUBA R N

Academic Year : 2023-24

Name of the Subject with code : Mathematics-II for ECE Stream (BMATE201)

Semester and year II / 2024

Name of the faculty :

| SL No | Contents in Course File | Page Number |
|---|---|---|
| 1. | Department Vision, Mission, PEOs, PSOs, POs | |
| 2. | Subject Allotment order | |
| 3. | Course Information sheet | |
| 4. | Calendar of Events | |
| 5. | Time Table of the class and Individual Time Table of the faculty | |
| 6. | Student List | |
| 7. | Syllabus copy for the course | |
| 8. | Lesson Plan | |
| 9. | Evaluation Pattern for the course | |
| 10. | CO-PO-PSOs Mapping and justification | |
| 11. | CO-PO Attainment sheet of the previous year for the same course<br>Actions taken to improve the attainment and report MoM from DAAC(DEPT Academic Advisory Committee) | |
| 12. | Lab Course Plan with CO/PO/PSO Mapping for Lab(IPCC)<br>CO PO mapping print out sheet for Lab<br>CO-PO Justification for the correlation given 1,2,3 for Lab<br>CO-PO Attainment sheet for Lab<br>CO-PO Attainment sheet of the previous year for the same lab course<br>Continuous Improvement Evaluation (CIE) in Lab sheet. | |
| 13. | Gaps in the curriculum as identified during the introduction of new scheme | |
| 14. | Topics Beyond Syllabus to bridge the Gaps in the Curriculum | |
| 15. | Internal Test Question papers with CO –PO mapping and Blooms Taxonomy with scheme of evaluation. | |

| | | |
|---|---|---|
| 16. | Internal Marks | |
| 17. | List of slow learners and attendance sheet of the remedial classes conducted and impact analysis. | |
| 18. | List of fast learners and their achievements | |
| 19. | Tutorial sheets(If applicable) | |
| 20. | Course Material | |
| 21 | Pedagogical/Innovative Teaching | |
| 22. | Impact Analysis sheet of Assignment/Seminar/Workshop along with PO attainment | |
| 23. | Course end survey by the students. | |
| 24. | Student Feedback | |
| 25. | Result Analysis | |
| 26. | CO-PO Attainment sheet | |
| 27. | Additional Responsibilities if any ..... | |

Babe.R.N

**Signature of Staff**

**Signature of HOD**

**Sir M. Visvesvaraya Institute of Technology**

**Department of Mathematics**

# VISION

To achieve academic excellence in mathematics thus enabling students to have enhanced opportunities in the field of mathematics and engineering.

# MISSION

To provide the students with a strong mathematical foundation which meets the requirement in the field of industry, research and higher education

# Sir M. Visvesvaraya Institute of Technology

## Department of Mathematics

### Vision

- To be a centre of excellence in technical and management education concurrently focusing on disciplined and integrated development of personality through quality education, sports, cultural and co-curricular activities.
- To promote transformation of students into better human beings, responsible citizens and competent professionals to serve as a valuable resource for industry, work environment and society.

### Mission

- To impart quality technical education, provide state-of-art facilities, achieve high quality in teaching-learning & research and encourage extra & co-curricular activities.
- To stimulate in students a spirit of inquiry and desire to gain knowledge and skills to meet the changing needs that can enrich their lives.
- To provide opportunity and resources for developing skills for employability and entrepreneurship, nurturing leadership qualities, imbibing professional ethics and societal commitment.
- To create an ambiance and nurture conducive environment for dedicated and quality staff to upgrade their knowledge & skills and disseminate the same to students on a sustainable long term basis.
- To facilitate effective interaction with the industries, alumni and research institutions.

**Programme Educational Objective (PEO):**

1. **To provide a degree course suitable for students enabling them to apply the concepts of mathematics to students.**
2. **To prepare students for further study and in preparing successful career in industry and R&D organization.**
3. **To provide students with knowledge of mathematics and in preparing successful career in industry and R&D organization.**

# Program Outcomes

| Sl. No. | Description | POs |
|---|---|---|
| 1 | Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and computer science and business systems to the solution of complex engineering and societal problems. | PO1 |
| 2 | Problem analysis: Identify, formulate, review research literature, and analyze complex engineering and business problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. | PO2 |
| 3 | Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. | PO3 |
| 4 | Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. | PO4 |
| 5 | Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations | PO5 |
| 6 | The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering and business practices. | PO6 |
| 7 | Environment and sustainability: Understand the impact of the professional engineering solutions in business societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. | PO7 |
| 8 | Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering and business practices. | PO8 |
| 9 | Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. | PO9 |
| 10 | Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. | PO10 |
| 11 | Project management and finance: Demonstrate knowledge and understanding of the engineering, business and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. | PO11 |
| 12 | Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. | PO12 |

# SIR M VISVESVARAYA INSTITUTE OF TECHNOLOGY

## Department of Mathematics

## Subject Allotment-2023-24(EVEN SEMESTER)

**Name of the staff: SHUBA R N**

**Designation: Assistant Professor**

**Subject allotted**:

| SL. No. | Name of the subject with code | Semester | Theory/Lab |
|---|---|---|---|
| 1 | Mathematics-II for EEE stream (D sec) | II | Theory |
| 2 | Discrete Mathematical Structures | IV | Theory |

| SL. No. | Title | Subject code | Semester |
|---|---|---|---|
| 1 | Mathematics Lab<br>(using Python) | BMATS201<br>BMATE201 | II Sem I & K sec<br>II Sem E sec |

Shuba. R N

**Signature of the faculty**

**HOD**

# COURSE INFORMATION SHEET

<table>
<tr><td>Course Name / Code</td><td colspan="3">Mathematics-II for EEE stream(BMAT201)</td></tr>
<tr><td>Degree / Branch</td><td colspan="3">B.E/</td></tr>
<tr><td>Course Credit</td><td colspan="3">4</td></tr>
<tr><td>Course Category</td><td colspan="3">Core Subject/Professional Elective/ Open Elective / Laboratory Course</td></tr>
<tr><td rowspan="3">Course Teacher Contact Details</td><td rowspan="2">Course Teacher Name</td><td colspan="2">Contact Details</td></tr>
<tr><td>Mobile</td><td>E-mail</td></tr>
<tr><td>SHUBA R N</td><td>9620442126</td><td>subha_math@sirmvit.edu</td></tr>
<tr><td>Head of the Department</td><td colspan="3">Dr Sreelakshmi N</td></tr>
</table>

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ
("ವಿ ಟ ಯು ಅಧಿನಿಯಮ 1994"ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)
VISVESVARAYA TECHNOLOGICAL UNIVERSITY
(State University of Government of Karnataka Established as per the VTU Act, 1994)

Phone :0831-2498100 / 240546
Fax : 0831-2405467
Email : registrar@vtu.ac.in
Web : https://vtu.ac.in

(1)

Reference:VTU/BOS/AC2023-24(EVEN)/6251 12 FEB 2024

**NOTIFICATION**

**Subject:** Tentative Academic Calendar for II sem B.E./B.Tech/B.Plan/B.Des/B.Arch, IV sem B.Arch./B.Plan., and VI sem of B.Arch/B.Plan, regarding...

**Reference:** Hon'ble Vice-Chancellor's approval Dated: 08.02.2024

The tentative academic calendar concerned with EVEN semesters of undergraduate programs(II sem B.E./B.Tech/B.Plan/B.Des/B.Arch, IV sem B.Arch./B.Plan., and VI sem of B.Arch/B.Plan)is attached to this notification for reference to all the stakeholders concerned.

The principals of non-autonomous, constituent, and autonomous engineering colleges and chairpersons of university departments are hereby informed to bring the academic calendar to the attention of all concerned.

If any suggestions/clarification/corrections, email-**sbhalbhavi@vtu.ac.in**

Sd/-
REGISTRAR

**To,**

1. The Principals of all Non-autonomous/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

**Copy to.**

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information and needful.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director ITI SMU, VTU Belagavi for information and to make arrangements to upload the Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi.
9. Office copy

12/02/24
**REGISTRAR**
12/02/24



ಜ್ಞಾನ ಸಂಗಮ" ಬೆಳಗಾವಿ – 590 018, ಕರ್ನಾಟಕ "Jnana Sangama", Belagavi - 590 018, Karnataka, INDIA

# Academic Calendar for EVEN Semester of UG programs for the year 2023-24

| | II semester B.E./B.Tech | II semester B.Plan/B.Arch/ B.Des | II semester B.Sc(Hons) | IV semester B.Arch. | IV semester B.Plan | VI Semester B.Arch. | VI semester B. Plan |
|---|---|---|---|---|---|---|---|
| Commencement of the Semester | 06.03.2024 | 06.03.2024 | 04.03.2024 | 04.03.2024 | 04.03.2024 | 26.02.202 | 06.03.2024 |
| Internship / Students Induction Program | --- | --- | --- | --- | --- | --- | --- |
| Commencement of Classes | 06.03.2024 | 06.03.2024 | 06.03.2024 | 06.03.2024 | 06.03.2024 | 26.02.2024 | 06.03.2024 |
| Last Working day of theSemester | 29.06.2024 | 29.06.2024 | 29.06.2024 | 29.06.2024 | 29.06.2024 | 22.06.2024 | 29.06.2024 |
| Practical Examination | 01.07.2024 To 11.07.2024 | 01.07.2024 To 11.07.2024 | 01.07.2024 To 06.07.2024 | 01.07.2024 To 06.07.2024 | 01.07.2024 To 06.07.2024 | 25.07.2024 To 31.07.2024 | 01.07.2024 To 06.07.2024 |
| Theory Examinations | 15.07.2024 To 10.08.2024 | 15.07.2024 To 10.08.2024 | 08.07.2024 To 27.07.2024 | 08.07.2024 To 27.07.2024 | 08.07.2024 To 02.08.2024 | 08.07.2024 To 02.08.2024 | 08.07.2024 To 02.08.2024 |
| Internship/Practical Exam for Lateral Entry Students | --- | --- | --- | --- | 03.08.2024 To 31.08.2024 | --- | 03.08.2024 To 31.08.2024 |
| Internship Viva Voce/ Project viva | --- | --- | --- | --- | --- | --- | --- |
| Commencement of NEXT Semester | 19.08.2024 | 19.08.2024 | 19.08.2024 | 05.08.2024 | 02.09.2024 | 05.08.2024 | 02.09.2024 |

REGISTRAR
Visvesvaraya Technological University
BELAGAVI.

SIR M. VISVESVARAYA INSTITUTE OF TECHNOLOGY, BANGALORE

DEPARTMENT OF MATHEMATICS

TIME TABLE FOR EVEN SEMESTER 2023-2024

**FACULTY NAME: SHUBA R N** **DESIGNATION: ASSISTANT PROFESSOR**

| TIME ⟹ / DAY ⇩ | 9:00 AM TO 9:55 AM | 9:55 AM TO 10:50 AM | 10:50 AM TO 11:00 AM | 11:00 AM TO 11:55 AM | 11:55 AM TO 12:50 PM | 12:50 PM TO 1:35 PM | 1:35 PM TO 2:30 PM | 2:30 PM TO 3:25 P.M. | 3:25 PM TO 4:20 PM |
|---|---|---|---|---|---|---|---|---|---|
| MONDAY | | 2D | TEA BREAK | CS-C | | ⟵ E2 LAB ⟶ | | | |
| TUESDAY | | 2D | | CS-C | | | 2D | | |
| WEDNESDAY | | CS-C | | | | | | | |
| THURSDAY | | CS-C | | | | | 2D | | |
| FRIDAY | ⟵ K2 LAB ⟶ | | | | | | | | |
| SATURDAY | ⟵ I1 LAB ⟶ | | | | | | | | |

**DETAILS OF FACULTY HANDING CLASSES**

| SL. NO. | COURSE TITLE | COURSE CODE |
|---|---|---|
| 1 | MATHEMATICS FOR ECE STREAM -II | BMATE201 |
| 2 | MATHEMATICS LAB PYTHON[CSE] | BMATS201 |
| 3 | MATHEMATICS LAB PYTHON[EEE] | BMATE201 |
| 4 | DESCRETE MATHEMATICAL STRUCTURES | BCS405A |

PREPARED BY: UMA S
DESIGNATION: ASSOCIATE PROFESSOR
SIGNATURE:

APPROVED BY: Dr.UMA S K
DESIGNATION: PROFESSOR AND HOD
SIGNATURE:

Professor and Head
Department of Mathematics
Sir M Visvesvaraya Institute of Technology

# Sir M. Visvesvaraya Institute of Technology, Bengaluru-562 157

**Academic Year: 2023-24** **Time Table - Second Semester: With Effect From 06/03/2024**

| Sem / Sec : II / D | BRANCH: EEE | ROOM NO: B209 | Block Name: Basic Science |
|---|---|---|---|

| TIME → DAY ↓ | 09.00 AM to 09.55 AM | 09.55 AM to 10.50 AM | 10.50 AM to 11.00 AM | 11.00 AM to 11.55 AM | 11.55 AM to 12.40 PM | 12.40 PM to 01.35 PM | 01.35 PM to 02.30 PM | 02.30 PM to 03.25 PM | 03.25 PM to 04.20 PM |
|---|---|---|---|---|---|---|---|---|---|
| Monday | BBEE203 | BMATE201 | TEA BREAK | ESC-II | LUNCH BREAK | BPWSK206 | BPHYE202 | C PROG LAB BESCK204E | |
| Tuesday | BKSKK207/ BKBKK207 | BMATE201 | | BPHYE202 | | BIDTK258 | BMATE201 | LG | LG |
| Wednesday | ETC-II | PHY LAB-D1 MATH LAB-D2 (MCA106) | | | | ESC-II | FORUM/CLUB ACTIVITIES | | |
| Thursday | PHY LAB-D2 MATH LAB-D1 (M210) | | TEA BREAK | BPHYE202 | | ETC-II | BMATE201 | BBEE203 | LIB |
| Friday | ETC-II | BPHYE202 | | ESC-II | | BBEE203 | LG | LIB | LIB |

| Sl. N0. | Course | Course code | Course Title | Faculty Names | Department |
|---|---|---|---|---|---|
| 1. | ASC(IC) | BMATE201 | Mathematics for EEE stream -II | Ms. R.N. Shuba | Mathematics |
| 2. | ASC(IC) | BPHYE202 | Applied Physics for EEE stream | Dr. Jayashree L | Physics |
| 3. | ESC | BBEE203 | Elements of Electrical Engineering | Dr. Mahesh K | EEE |
| 4. | ESC-II | BESCK204X | Engineering Science Course- II | Refer to the attached table for details of faculty names and room numbers | |
| 5. | ETC-II | BETCK205X | Emerging Technology Course -II | | |
| 6. | AEC | BPWSK206 | Professional Writing Skills in English | Mr. Vishwas | Humanities |
| 7. | HSMS | BKSKK207/BKBKK207 | Samskrutika Kannada / Balake Kannada | Mr. Prashantha BB & Mr. Ramkumar S | Humanities |
| 8. | AEC/SDC | BIDTK258 | Innovation and Design Thinking | Dr. C.V. Mohan | EEE |

**Class Advisors:** Ms. Jayashree & Mr. Rajesh Kumar

| Time Table officer - TTO | | Chief Time Table Officer - CTO | Principal |
|---|---|---|---|
| Name | Dr. G.K. Prashanth | Mr. S.B. Halesh | Prof. S.G. Rakesh |
| Signature | Prashanth G K | | |

| Sir M. Visvesvaraya Institute of Technology | | | |
|---|---|---|---|
| Bengaluru-562157 | | | |
| Academic Coordination Cell | | | |
| Chemistry Cycle | | | |
| Section wise Student List (Computer Science Engg.) | | | |
| **Semester: II** | | **A.Y: 2023-24** | |
| **Branch:** | **CS** | **Section: K** | |
| **Room No. : B110** | | **W.E.F: 06-March-2024** | |
| **Class Advisors:** | | **Mrs. Purnimaa S. Dixit & Mrs. Divya** | |
| **S.No** | **USN** | **Student name** | **Student Sign / Remarks** |
| 1 | 1MV23CS128 | RUCHIKA S V | |
| 2 | 1MV23CS129 | S KEERTHANA | |
| 3 | 1MV23CS130 | S SAI VENKATA ASHISH SAGABALA | |
| 4 | 1MV23CS131 | S SIRISHA | |
| 5 | 1MV23CS132 | SAHANA | |
| 6 | 1MV23CS133 | SAIKUMAR PUJARI | |
| 7 | 1MV23CS134 | SAISAKET DHANNURE | |
| 8 | 1MV23CS135 | SAKETH ALEVOORAYA K | |
| 9 | 1MV23CS136 | SAKSHAM TIWARI | |
| 10 | 1MV23CS137 | SAMEER RAJ | |
| 11 | 1MV23CS138 | SAMYAK | |
| 12 | 1MV23CS139 | SANDEEP KUMAR | |
| 13 | 1MV23CS140 | SANKETH R | |
| 14 | 1MV23CS141 | SANSKAR PANDEY | |
| 15 | 1MV23CS142 | SATYAM KUMAR | |
| 16 | 1MV23CS143 | SEMBETI NRUSIMHA ARYA VARDHAN | |
| 17 | 1MV23CS144 | SHAIK SIBGATHULLA | |
| 18 | 1MV23CS145 | SHANKAR B KORI | |
| 19 | 1MV23CS146 | SHASHWAT NAMDEO | |
| 20 | 1MV23CS147 | SHASHWAT PANDEY | |
| 21 | 1MV23CS148 | SHASHWAT SHAURYA | |
| 22 | 1MV23CS149 | SHASHWAT SHUKLA | |
| 23 | 1MV23CS150 | SHREYAS DODDAMANI | |
| 24 | 1MV23CS151 | SHUBHASHREE BABURAYA NAYAK | |
| 25 | 1MV23CS152 | SHYAM RAJU N | |
| 26 | 1MV23CS153 | SINDHU ADIVEPPA WADARATTI | |
| 27 | 1MV23CS154 | SMITHA M | |
| 28 | 1MV23CS155 | SNEHA Y M | |
| 29 | 1MV23CS156 | SONIKA G K | |

| Branch: | CS | Section: K | |
|---|---|---|---|
| 30 | 1MV23CS157 | SRUSHTI MANOHAR HOSAMANI | |
| 31 | 1MV23CS158 | SUBHOJIT DEY | |
| 32 | 1MV23CS159 | SUHAS T | |
| 33 | 1MV23CS160 | SUJAY JN | |
| 34 | 1MV23CS161 | SUPARN NAYAK | |
| 35 | 1MV23CS162 | SUPRABHA C ADIGA | |
| 36 | 1MV23CS163 | SWAPNA K Y | |
| 37 | 1MV23CS164 | SWETANSHU A | A |
| 38 | 1MV23CS165 | TANMAY SHARMA A | |
| 39 | 1MV23CS166 | TEJASWINI N | |
| 40 | 1MV23CS167 | UJJWAL RAMAN A | |
| 41 | 1MV23CS168 | UJWAL KUMAR A | |
| 42 | 1MV23CS169 | UMME RUMAAN | |
| 43 | 1MV23CS170 | USHA RANI B M | |
| 44 | 1MV23CS171 | UTPAL KUMAR | |
| 45 | 1MV23CS172 | V B VARSHA BALASUBRAMANYA A | |
| 46 | 1MV23CS173 | VAIBHAV SINGH | |
| 47 | 1MV23CS174 | VAISHNAVI | |
| 48 | 1MV23CS175 | VALLAPUREDDY SHANMUKA | |
| 49 | 1MV23CS176 | VANDANA P B | |
| 50 | 1MV23CS177 | VARSHA H L | |
| 51 | 1MV23CS178 | VARSHA K N | |
| 52 | 1MV23CS179 | VIBHANSHI JAIN A | A |
| 53 | 1MV23CS180 | VIJAY V R | |
| 54 | 1MV23CS181 | VIKAS | |
| 55 | 1MV23CS182 | VIKRAM RAWAL A | |
| 56 | 1MV23CS183 | VINAYAK SARAF A | A |
| 57 | 1MV23CS184 | VINUTHA V | |
| 58 | 1MV23CS185 | VISESH BAJPAI A | A |
| 59 | 1MV23CS186 | VISHWANATH SHIVANANDA HUBBALLI | |
| 60 | 1MV23CS187 | YAMANOORAPPA RATHOD A | |
| 61 | 1MV23CS188 | YASHAS ALLAPPANAVAR | A |
| 62 | 1MV23CS189 | YASHASWI ANAND A | A |
| 63 | 1MV23CS190 | YASHWANTH A | |

**Academic Coordinator** **Principal**

| Sir M. Visvesvaraya Institute of Technology, Bangalore 562 157 | | | Academic Year 2023 - 2024 |
|---|---|---|---|
| Test: 2 | Date: 24 - 6 - 24 | Time: 10:00 a.m | Room No: E305 |
| Course / Branch: B.E / EE | Section: | Semester: II | Sub Code: BEMAT201 |
| Invigilator's Name: Suraj kumar B. P | | | |

| Sl. No. | USN | Student's Name | | Booklet's Number | Student's Signature | Marks Obtained |
|---|---|---|---|---|---|---|
| 1 | 1MV23EE001 | ACHAL CHOURASIYA | 14 | 41302 | | 23 |
| 2 | 1MV23EE002 | ADARSH KUMAR G M | 7 | 41301 | | 12 |
| 3 | 1MV23EE003 | ADITYA SURYA DEV N P | 14 | 41297 | | 24 |
| 4 | 1MV23EE004 | AKARSHIKA SRIVASTAVA | 10 | 41305 | | 17 |
| 5 | 1MV23EE005 | AMBIKA SHATAGAR | 14 | 41312 | | 23 |
| 6 | 1MV23EE006 | ANANYA SINGH | 13 | 41316 | | 22 |
| 7 | 1MV23EE007 | ANKIT KUMAR | 8 | 41313 | | 14 |
| 8 | 1MV23EE008 | ARYA M | | ABSENT | | |
| 9 | 1MV23EE009 | ARYA PRASAD S | 4 | 41306 | | 07 |
| 10 | 1MV23EE010 | ARYAN ANILRAO DESALE | 9 | 41315 | | 15 |
| 11 | 1MV23EE011 | ASTITWA SINGH | 10 | 41317 | | 17 |
| 12 | 1MV23EE012 | BAIREDDY KALYANI | 15 | 41314 | | 25 |
| 13 | 1MV23EE013 | BHARAT M HANASI | 14 | 41311 | | 23 |
| 14 | 1MV23EE014 | BHASKAR SINHA | 12 | 41293 | | 20 |
| 15 | 1MV23EE015 | CHANDAN J | 14 | 41318 | | 24 |
| 16 | 1MV23EE016 | CHEELAM VARUN REDDY | 11 | 41299 | | 19 |
| 17 | | | | | | |
| 18 | | | | | | |
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| 29 | | | | | | |
| 30 | | | | | | |

| No. of Booklets Issued: 16 | | No. of Unused Booklets Returned: 1 |
|---|---|---|
| No. of Students Present: 15 | | No. of Students Absent: 1 |
| Receiver's Name: RSI | Receiver's Signature | Invigilator's Signature |

| Sir M. Visvesvaraya Institute of Technology, Bangalore 562 157 | | | Academic Year 2023 - 2024 |
|---|---|---|---|
| Test: 02 | Date: 24/06/24 | Time: 10.00 - 11.00 AM | Room No: E309 |
| Course / Branch: B.E / EE | Section: D | Semester: II | Sub Code: BMATE201 |
| Invigilator's Name: Ishwee Rani | | | |

| Sl. No. | USN | Student's Name | Booklet's Number | Student's Signature | Marks Obtained | |
|---|---|---|---|---|---|---|
| 1 | 1MV23EE017 | DEEKSHITHA D G | 41262 | Deekshitha | 18 | 11 |
| 2 | 1MV23EE018 | DEEPIKA E | 41281 | Deepika.E | 25 | 15 |
| 3 | 1MV23EE019 | DIAMOND TIRTHANKAR RAJ | 41286 | Diamond. | 08 | 08 |
| 4 | 1MV23EE020 | DILEEP L | 41478 | Dileep L | 15 | 9 |
| 5 | 1MV23EE021 | FIZA KOUSAR | 41480 | Fiza. | 25 | 15 |
| 6 | 1MV23EE022 | G K SPOORTHI | 41261 | Spoorthi | 04 | 2 |
| 7 | 1MV23EE023 | GAYATRI | 41289 | Gayatri | 25 | 15 |
| 8 | 1MV23EE024 | GIRISH T P | 41274 | Girish T P | 13 | 8 |
| 9 | 1MV23EE025 | HEMANTH K D | 41479 | Hemanth | 16 | 10 |
| 10 | 1MV23EE026 | JEEVAN | 41268 | Jeevan | 16 | 10 |
| 11 | 1MV23EE027 | KEERTHANA B Y | 41290 | KeerthanaBY | 25 | 15 |
| 12 | 1MV23EE028 | LAKSHMI | 41269 | Lakshmi | 18 | 18 11 |
| 13 | 1MV23EE029 | LAKSHMI H GOWDA | 41263 | LakshmiHGowda | 23 | 14 |
| 14 | 1MV23EE030 | LAVANYA R | 41270 | | 17 | 10 |
| 15 | 1MV23EE031 | LIKHITH S R | 41264 | | 19 | 11 |
| 16 | 1MV23EE032 | MAANYA S | 41482 | Maanya S | 25 | 15 |
| 17 | 1MV23EE033 | MAHAMMAD ANEEF M | 41265 | Aneef. M | 12 | 7 |
| 18 | 1MV23EE034 | MANOHAR KUMAR | 41267 | Manohar. | 23 | 14. |
| 19 | | | | | | |
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| No. of Booklets Issued: 18 | No. of Unused Booklets Returned: 0 |
|---|---|
| No. of Students Present: 18 | No. of Students Absent: 0 |
| Receiver's Name: | Receiver's Signature / Invigilator's Signature |

**Sir M. Visvesvaraya Institute of Technology, Bangalore 562 157**

Academic Year: 2023 - 2024

Test: II | Date: 24/6/24 | Time: 10:00 - 11:00 | Room No: M010

Course / Branch: B.E / ~~CSE~~ | Section: D | Semester: II | Sub Code: BMATE201

Invigilator's Name: Savitha. P

| Sl. No. | USN | Student's Name | Booklet's Number | Student's Signature | Marks Obtained |
|---|---|---|---|---|---|
| 1 | 1MV23EE035 | MAYANK KUMAR | 60355 | Mayank | 16 |
| 2 | 1MV23EE036 | MUSTAFA BOHRA | 60356 | Mustafa | 25 |
| 3 | 1MV23EE037 | NAINIKA | 60357 | Nainika | 17 |
| 4 | 1MV23EE038 | NANDINI APAAR | 60358 | Nandini | 25 |
| 5 | 1MV23EE039 | NANDINI ARKACHARI | 60360 | Nandini | 23 |
| 6 | 1MV23EE040 | NANDITHA R | 60359 | Nanditha | 13 |
| 7 | 1MV23EE041 | NARSING | 60354 | [illegible] | 16 |
| 8 | 1MV23EE042 | NAVEEN KUMAR | 60353 | Naveen | 14 |
| 9 | 1MV23EE043 | NAVEEN R | 60351 | Naveen | 23 |
| 10 | 1MV23EE044 | NIMISHA TRIPATHI | 60352 | Nim | 22 |
| 11 | 1MV23EE045 | NIMISHITH GOWDA D P | 60350 | Nimi | 25 |
| 12 | 1MV23EE046 | NITESH KUMAR SAH | 60349 | Nitesh | 25 |
| 13 | 1MV23EE047 | NITISH KUMAR | 60342 | Nitish Kum | 0 |
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| No. of Booklets Issued: 13 | No. of Unused Booklets Returned: — |
| No. of Students Present: 13 | No. of Students Absent: — |
| Receiver's Name: Uma.S | Receiver's Signature: Suma |
| | Invigilator's Signature: S.P |

**Sir M. Visvesvaraya Institute of Technology, Bangalore 562 157**

| | | | |
|---|---|---|---|
| Test: 2 | Date: 24/6/24 | Time: 10:00-11:00 | Academic Year 2023 - 2024 |
| Course / Branch: B.E / EE | Section: D | Semester: II | Room No: BT202 |
| Invigilator's Name: Janani | | | Sub Code: BMATE201 |

| Sl. No. | USN | Student's Name | Booklet's Number | Student's Signature | Marks Obtained |
|---|---|---|---|---|---|
| 1 | 1MV23EE048 | OMKAR | 41454 | | 18 |
| 2 | 1MV23EE049 | PATEL ADITI HIRALAL | ABSENT | | |
| 3 | 1MV23EE050 | PIYUSH RATN | 41455 | | 25 |
| 4 | 1MV23EE051 | POOJA P | 41469 | | 11 |
| 5 | 1MV23EE052 | POOJA S N | 41464 | | 19 |
| 6 | 1MV23EE053 | PRAJWAL APPASAHEB SHINDHE | 41465 | | 24 |
| 7 | 1MV23EE054 | PRANAV BHARDWAJ | 41466 | | 13 |
| 8 | 1MV23EE055 | PRATHAM SHARMA | 41467 | | 24 |
| 9 | 1MV23EE056 | PRAVAAL RAJ MISHRA | 41463 | | 13 |
| 10 | 1MV23EE057 | PREKSHA MUNDRA | 41468 | | 22 |
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Moderation completed
01/07/24

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| No. of Booklets Issued: 10 | | No. of Unused Booklets Returned: 10 | |
| No. of Students Present: 9 | | No. of Students Absent: 1 | |
| Receiver's Name: Uma.S | Receiver's Signature: Suma | | Invigilator's Signature |

16-2-2023

**II Semester**

| Course Title: | **Mathematics-II for Electrical & Electronics Engineering Stream** | | |
|---|---|---|---|
| Course Code: | **BMATE201** | CIE Marks | 50 |
| Course Type (Theory/Practical/Integrated) | Integrated | SEE Marks | 50 |
| | | Total Marks | 100 |
| Teaching Hours/Week (L:T:P: S) | 2:2:2:0 | Exam Hours | 03 |
| Total Hours of Pedagogy | 40 hours Theory + 10 to12 Lab slots | Credits | 04 |

**Course objectives:**The goal of the course**Mathematics-II for Electrical & Electronics Engineering Stream(22MATE21)** is to

- **Familiarize** the importance of Vector calculus, Vector Space and Linear transformation for electronics and electrical engineering.
- **Have an insight** into solving ordinary differential equations by using Laplace transform techniques.
- **Develop** the knowledge of solving electronics and electrical engineering problems numerically.

**Teaching-Learning Process**
**Pedagogy (General Instructions):**
These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.

1. In addition to the traditional lecture method, different types of innovative teaching methods may be adopted so that the delivered lessons shall develop students' theoretical and applied mathematical skills.
2. State the need for Mathematics with Engineering Studies and Provide real-life examples.
3. Support and guide the students for self–study.
4. You will also be responsible for assigning homework, grading assignments and quizzes, and documenting students' progress.
5. Encourage the students to group learning to improve their creative and analytical skills.
6. Show short related video lectures in the following ways:
   - As an introduction to new topics (pre-lecture activity).
   - As a revision of topics (post-lecture activity).
   - As additional examples (post-lecture activity).
   - As an additional material of challenging topics (pre-and post-lecture activity).
   - As a model solution of some exercises (post-lecture activity).

**Module-1:Vector Calculus (8 hours)**

**Introduction to Vector Calculus in EC & EE engineering applications.**

**Vector Differentiation:** Scalar and vector fields. Gradient, directional derivative, curl and divergence - physical interpretation, solenoidal and irrotational vector fields. Problems.

**Vector Integration:** Line integrals, Surface integrals. Applications to work done by a force and flux. Statement of Green's theorem and Stoke's theorem. Problems.

**Self-Study:** Volume integral and Gauss divergence theorem.

**Applications:** Conservation of laws, Electrostatics, Analysis of streamlines and electric potentials.

**(RBT Levels: L1, L2 and L3)**

**Module-2:Vector Space and Linear Transformations(8 hours)**

**Importance of Vector Space and Linear Transformations in the field of EC & EE engineering applications.**

**Vector spaces:** Definition and examples, subspace, linear span, Linearly independent and dependent sets, Basis and dimension.

**Linear transformations**: Definition and examples, Algebra of transformations, Matrix of a linear transformation. Change of coordinates, Rank and nullity of a linear operator, Rank-Nullity theorem. Inner product spaces and orthogonality.

**Self-study:** Angles and Projections.Rotation, reflection, contraction and expansion.

**Applications:** Image processing, AI & ML, Graphs and networks, Computer graphics.

**(RBT Levels: L1, L2 and L3)**

**Module-3:Laplace Transform(8 hours)**

**Importance of Laplace Transform for EC & EE engineering applications.**

Existence and Uniqueness of Laplace transform (LT), transform of elementary functions, region of convergence. Properties–Linearity, Scaling, t-shift property, s-domain shift, differentiation in the s-domain, division by t, differentiation and integration in the time domain. LT of special functions-periodic functions (square wave, saw-tooth wave, triangular wave, full & half wave rectifier), Heaviside Unit step function, Unit impulse function.

**Inverse Laplace Transforms:**

Definition, properties, evaluation using different methods, convolution theorem (without proof), problems, and applications to solve ordinary differential equations.

**Self-Study:** Verification of convolution theorem.

**Applications:** Signals and systems, Control systems, LR, CR & LCR circuits.

**(RBT Levels: L1, L2 and L3)**

**Module-4:Numerical Methods -1(8 hours)**

**Importance of numerical methods for discrete data in the field of EC & EE engineering applications.**

Solution of algebraic and transcendental equations: Regula-Falsi method and Newton-Raphson method (only formulae). Problems.

Finite differences, Interpolation using Newton's forward and backward difference formulae, Newton's divided difference formula and Lagrange's interpolation formula (All formulae without proof). Problems.

**Numerical integration**: Trapezoidal, Simpson's $(1/3)^{rd}$ and $(3/8)^{th}$ rules(without proof). Problems.

**Self-Study:** Bisection method, Lagrange's inverse Interpolation, Weddle's rule.

**Applications:** Estimating the approximate roots, extremum values, area, volume, and surface area.
**(RBT Levels: L1, L2 and L3)**

**Module-5:Numerical Methods -2(8 hours)**

**Introduction to various numerical techniques for handling EC & EE applications.**
**Numerical Solution of Ordinary Differential Equations (ODEs):**
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 and Milne's predictor-corrector formula (No derivations of formulae). Problems.

**Self-Study:** Adam-Bashforth method.
**Applications:** Estimating the approximate solutions of ODE for electric circuits.
**(RBT Levels: L1, L2 and L3)**

**List of Laboratory experiments (2 hours/week per batch/ batch strength 15)**
**10 lab sessions + 1 repetition class + 1 Lab Assessment**

| | |
|---|---|
| **1** | Finding gradient, divergent, curl and their geometrical interpretation and Verification of Green's theorem |
| **2** | Computation of basis and dimension for a vector space and Graphical representation of linear transformation |
| **3** | Visualization in time and frequency domain of standard functions |
| **4** | Computing inverse Laplace transform of standard functions |
| **5** | Laplace transform of convolution of two functions |
| **6** | Solution of algebraic and transcendental equations by Regula-Falsi and Newton-Raphson method |
| **7** | Interpolation/Extrapolation using Newton's forward and backward difference formula |
| **8** | Computation of area under the curve using Trapezoidal, Simpson's $(1/3)^{rd}$ and $(3/8)^{th}$ rule |
| **9** | Solution of ODE of first order and first degree by Taylor's series and Modified Euler's method |
| **10** | Solution of ODE of first order and first degree by Runge-Kutta $4^{th}$ order and Milne's predictor-corrector method |

**Suggested software's:** Mathematica/MatLab/Python/Scilab

**Course outcome (Course Skill Set)**
At the end of the course the student will be able to:

| | |
|---|---|
| CO1 | Understand the applications of vector calculus refer to solenoidal, irrotational vectors, lineintegral and surface integral. |
| CO2 | Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation |
| CO3 | To understand the concept of Laplace transform and to solve initial value problems. |
| CO4 | Apply the knowledge of numerical methods in solving physical and engineering phenomena. |
| CO5 | Get familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/PYTHON/ SCILAB |

16-2-2023

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation(CIE):**

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks.**

**CIE for the theory component of the IC**

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totalling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 marks**

**CIE for the practical component of the IC**

- On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. The **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test **(duration 03 hours)** at the end of the 15$^{th}$ week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to **05 marks.**

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks.**

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (40% of maximum marks) in the practical component. The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 05 questions is

to be set from the practical component of IC/IPCC, the total marks of all questions should not be more than 25 marks.

The theory component of the IC shall be for both CIE and SEE.

**Semester End Examination(SEE):**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

- The question paper shall be set for 100 marks. The medium of the question paper shall be English/Kannada). The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally reduced to 50 marks**.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

**Suggested Learning Resources:**

**Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)**

**Text Books**


1. **B. S. Grewal**: "Higher Engineering Mathematics", Khanna Publishers, 44$^{th}$Ed., 2021.
2. **E. Kreyszig**: "Advanced Engineering Mathematics", John Wiley & Sons, 10$^{th}$Ed., 2018.


**Reference Books**


1. **V. Ramana:** "Higher Engineering Mathematics" McGraw-Hill Education, 11$^{th}$ Ed., 2017
2. **Srimanta Pal & Subodh C.Bhunia**: "Engineering Mathematics" Oxford University Press, 3$^{rd}$Ed., 2016.
3. **N.P Bali and Manish Goyal**: "A Textbook of Engineering Mathematics" Laxmi Publications, 10$^{th}$Ed., 2022.
4. **C. Ray Wylie, Louis C. Barrett:** "Advanced Engineering Mathematics" McGraw – Hill Book Co., New York, 6$^{th}$ Ed., 2017.
5. **Gupta C.B, Sing S.R and Mukesh Kumar:** "Engineering Mathematic for Semester I and II", Mc-Graw Hill Education(India) Pvt. Ltd 2015.
6. **H.K. Dass and Er. Rajnish Verma:** "Higher Engineering Mathematics" S.Chand Publication, 3$^{rd}$ Ed.,2014.
7. **James Stewart:** "Calculus" Cengage Publications, 7$^{th}$Ed., 2019.
8. **David C Lay:** "Linear Algebra and its Applications", Pearson Publishers, 4$^{th}$ Ed., 2018.
9. **Gareth Williams:** "Linear Algebra with applications", Jones Bartlett Publishers Inc., 6$^{th}$ Ed., 2017.
10. **Gilbert Strang:** "Linear Algebra and its Applications", Cengage Publications, 4$^{th}$ Ed., 2022.


**Web links and Video Lectures (e-Resources):**

- http://nptel.ac.in/courses.php?disciplineID=111
- http://www.class-central.com/subject/math(MOOCs)
- http://academicearth.org/
- VTU e-Shikshana Program
- VTU EDUSAT Program

**Activity-Based Learning (Suggested Activities in Class)/Practical-Based Learning**

- Quizzes
- Assignments
- Seminar

**COs and POs Mapping (Individual teacher has to fill up)**

| COs | POs | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| CO1 | | | | | | | |
| CO2 | | | | | | | |
| CO3 | | | | | | | |
| CO4 | | | | | | | |
| CO5 | | | | | | | |

**Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped**

| SIR M VISVESVARAYA INSTITUTE OF TECHNOLOGY, BENGALURU-562157<br>DEPARTMENT OF MATHEMATICS | |
|---|---|
| **COURSE NAME: - Mathematics-II for Electrical & Electronics Engineering Stream**<br>**COURSE CODE: BMATE201** | **LESSON PLAN-EVEN SEM**<br>**AY: 2023-24** |

**Course Outcomes (Course skills Sets):**

**At the end of the course the student will be able to:**

**CO1:** Understand the applications of vector calculus refer to solenoidal, irrotational vectors, line integral and surface integral.
**CO2:** Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation.
**CO3:** To understand the concept of Laplace transform and to solve initial value problems.
**CO4:** Apply the knowledge of numerical methods in solving physical and engineering phenomena.
**CO5:** Get familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/PYTHON/SCILAB

**Name of the Staff: SHUBA R N**

| DATE | | TOPICS PLANNED | COs | POs | PI | RBT |
|---|---|---|---|---|---|---|
| FROM | TO | | | | | |
| 6/3/24 | 8/3/24 | **Module-4: Numerical methods -1**<br>• Solution of polynomial and transcendental equations: Regula-Falsi and Newton-Raphson Methods-Problems.<br>• Finite differences, Interpolation using Newton's forward and backward difference formulae-problems. | CO4 | PO1& PO2 | 1.1.1 | L1 L2 L3 |
| 11/03/24 | 15/03/24 | • Newton's divided difference formula-Problems.<br>• Lagrange's interpolation formula-Problems.<br>• Numerical integration: Trapezoidal,Simpson's (1/3)rd and (3/8)th rules-Problems. | CO4 | PO1& PO2 | 1.1.1 | L1 L2 L3 |
| 20/03/24 | 22/03/24 | **Module-5: Numerical Methods -2**<br>• Numerical solution of ordinary differential equations of first order and first degree - Taylor's series method-Problems<br>• Modified Euler's method- Problems<br>• Runge-Kutta method of fourth order - Problems<br>• Milne's predictorcorrector formula- Problems | CO5 | PO1& PO2 | 1.1.1 | L1 L2 L3 |
| 25/03/24 | 29/03/24 | **Module-3: Laplace Transform**.<br>• Existence and Uniqueness of Laplace transform (LT), transform of elementary functions, region of convergence. | CO3 | PO1& PO2 | 1.1.1 | L1 L2 L3 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | • Properties–Linearity, Scaling, t-shift property, s-domain shift, differentiation in the sdomain, division by t, differentiation and integration in the time domain | | | | |
| 01/04/24 | 05/04/24 | • LT of special functions- periodic functions-Problems.<br>• Heaviside Unit step function-Problem | CO3 | PO1& PO2 | 1.1.1 | L1 L2 L3 |
| 08/04/24 | 12/04/24 | • Unit impulse function-Problems.<br>Inverse Laplace Transforms:<br>Definition, properties, evaluation using different methods | CO3 | PO1& PO2 | 1.1.1 | L1 L2 L3 |
| 15/04/24 | 19/04/24 | • convolution theorem – problems,<br>• Applications to solve ordinary differential equations | CO3 | PO1& PO2 | 1.1.1 | L1 L2 L3 |
| 22/04/24 | 26/04/24 | **Module-1: Vector Calculus**<br>• Vector Differentiation: Scalar and vector fields.<br>• Gradient, directional derivative, curl and divergence - physical interpretation<br>solenoidal and irrotational vector fields. Problems | CO1 | PO1& PO2 | 1.1.1 | L1 L2 L3 |
| 29/04/24 | 03/05/24 | Vector Integration: Line integrals, Surface integrals. | CO1 | PO1& PO2 | 1.1.1 | L1 L2, L3 |
| 06/05/24 | 10/05/24 | • Applications to work done by a force and flux-Problems<br>• Statement of Green's theorem and Stoke's theorem-Problems | CO1 | PO1& PO2 | 1.1.1 | L1 L2 L3 |
| 13/05/24 | 17/05/24 | **I-Internals** | | | | |
| 20/05/24 | 24/05/24 | **Module-2: Vector Space and Linear Transformations.**<br>• Vector spaces: Definition and examples<br>• subspace, linear span-Problems. | CO2 | PO1& PO2 | 1.1.1 | L1 L2 L3 |
| 27/05/24 | 31/05/24 | • Linearly independent and dependent sets-Problems | CO2 | PO1& PO2 | 1.1.1 | L1 L2 L3 |
| 03/06/24 | 07/06/24 | • Basis and dimension--Problems<br>• Linear transformations: Definition and examples, Algebra of transformations. | CO2 | PO1& PO2 | 1.1.1 | L1 L2 L3 |
| 10/06/24 | 14/06/24 | • Matrix of a linear transformation. Change of coordinates.<br>• Rank-Nullity theorem. Inner product spaces and orthogonality-Problems. | CO2 | PO1& PO2 | 1.1.1 | L1 L2 L3 |
| 17/06/24 | 21/06/24 | **Revision** | | | | |
| 24/06/24 | 29/06/24 | **II-Internals** | | | | |

| | |
|---|---|
| pared by: Shuba R N<br>gnature : Shuba R N.<br>Designation : Assistant Professor | Approved by :<br>Signature :<br>Designation : Professor & HOD |

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

State University of Government of Karnataka Established as per the VTU Act, 1994 "Jnanasangama" Belagavi-590018, Karnataka, India

Prof. R. S. Rangaswamy, Ph.D
REGISTRAR

Phone: (0831) 2498100
Fax: (0831) 2405467

REF: VTU/BGM/Aca/BoS/2023/ 1335

DATE: 13 JUN 2023

# REVISED CIRCULAR

**Subject:** CIE and SEE evaluations for 2022 scheme engineering programs regarding...

**Reference:**
1. JBOS 10.02.2023 and 171st EC meeting Proceeding no. 2.2.1
2. dated: 23.02.2023
3. VTU/BGM /ACA /BoS /2023 / 7350, dated 16.03.2023
4. VTU/ BGM /ACA/ BoS /2023 / 661, dated 02.05.2023,
5. Dean Sir approval vide email dated: 07.06.2023
6. The Hon'ble Vice-Chancellor's approval Dated: 07.06.2023

The evaluation (CIE+SEE) details for the 2022 scheme of study and examinations for all undergraduate engineering programs were notified by the circular VTU/BGM/ACA/BoS/2023/7350, dated 16.03.2023, and is only valid for the first semester.

The Regulations governing the award of B.E./B. Tech degrees were finalized and approved in Resolution No. 2.2.1 of the 171st EC meeting. The same was notified vide notification VTU /BGM /ACA/ BoS/ 2023/661, dated 02.05.2023. Therefore the evaluation procedures outlined in the circular VTU/BGM/ACA/BoS/2023/7350, dated 16.03.2023, and are no longer valid. All university stakeholders are advised to adopt the CIE+SEE as specified in the Regulations governing the issuance of B.E./B.Tech., Degrees for Scheme 2022.

*Please note:*

*The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). The student is declared as a pass in the course if he/she secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.*

To put it simply, evaluation techniques/methods are listed in the table for further understanding

| Course with Credits | Evaluation Type | Maximum Marks | Minimum Passing Marks | Evaluation Details |
|---|---|---|---|---|
| 04 Credit IPCC | Total CIE theory + practical | 50 | 20 | |
| | CIE –IA Tests | 15 | 6 | Average of Two Internal Assessment Tests each of 25 marks, scale down the marks scored to 15 marks |
| | CIE – CCAs | 10 | 4 | Any two Assessment methods as per clause 22084.2 of Regulations (if assessment is project based, then one assessment method may be accepted) |
| | Total CIE Theory | 25 | 10 | Scale down marks of tests and assignments to 25 |
| | CIE Practical | 15 | 06 | Conduction of experiments and Preparation of Laboratory records, etc |
| | CIE Practical Test | 10 | 04 | One test after all experiment's conduction for 50 marks |
| | Total CIE Practical | 25 | 10 | Scale down marks of Expts. record and test to 25 |
| | SEE | 50 | 18 | SEE exam is a theory exam, conducted for 100 marks, scored marks are scaled down to 50 marks |
| | CIE+SEE | 100 | 40 | |
| | The minimum marks to be secured in CIE to appear for SEE shall be 10 (40% of maximum marks-25) in the theory component and 10 (40% of maximum marks -25) in the practical component. The laboratory component of the IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included in their respective modules only. | | | |
| 03 and 02 Credit Courses | CIE - IA Tests | 25 | 10 | Average of Two Internal Assessment Tests each of 25 marks |
| | CIE – CCAs | 25 | 10 | Any two Assessment methods as per clause 22084.2 of Regulations (*if it is project based, one assignment shall be given) |
| | SEE | 50 | 18 | SEE exam is a theory exam, conducted for 100 marks, scored marks are scaled down to 50 marks. |
| | CIE+SEE | 100 | 40 | |
| | Note: A few of the courses of 03 credits are Integrated Course type, for such courses the method suggested for 04 credits IPCC shall be followed. | | | |
| 01 Credit Course | CIE - IA Tests | 25 | 10 | Average Of Two Internal Assessment Tests each of 25 marks |
| | CIE – CCAs | 25 | 10 | Any two Assessment method as per clause 22084.2 of Regulations |
| | SEE (MCQ Type) | 50 | 18 | MCQ-type question papers of 50 questions with each question of 01 mark, examination duration is 01 hour |
| | CIE+SEE | 100 | 40 | |

The recommended evaluations are meant to get students involved in all forms of assessment and improve their SEE performance.

All the Principals of the Engineering Colleges/Chairpersons of the University departments are hereby informed to bring the content of this Notification to the notice of all concerned.

Sd/-
Registrar

To,

1. All the Principals of affiliated/ Constituent / Autonomous Engineering Colleges under the ambit of the VTU Belagavi
2. The Chairperson and Program Coordinator, PG Centres' VTU Belagavi, Kalaburagi, Mysuru, and Bengaluru where B.E./B.Tech., programs are being offered.

Copy to

1. To the Hon'ble Vice-Chancellor through the secretary to VC for information
2. The Registrar (Evaluation) for information and needful
3. The Director ITI SMU VTU Belagavi for information and make arrangements to upload it on the VTU web portal.
4. The Special Officer QPDS Examination section VTU Belagavi
5. The Coordinator IQAC VTU Belagavi
6. Office Copy

for 12/06/23 C&E

REGISTRAR

12/6/23.

SIR M VISVESVARAYA INSTITUTE OF TECHNOLOGY, BENGALURU - 562157

DEPARTMENT OF MATHEMATICS

**NAME OF THE FACULTY:** Shuba R N

**BATCH: 2023** **SCHEME: 2022** **BRANCH: CS/IS/IOT/AIML/BT**

## 1. POs CORRELATION

| Sl.No | VTU Course Code | Course Name | POs Correlation |
|---|---|---|---|
| 1 | BMATS201 | Engineering Mathematics –II For CSE stream | PO1, PO2, PO5 |

## 2. COURSE OUTCOMES (COs)

| Semester: I | Year of Study: 2023-24 |
|---|---|
| CO1 | Apply the concept of change of order of integration and change of variables to evaluate multiple integrals and their usage in computing the area and volume. |
| CO2 | Understand the applications of vector calculus to refer to solenoidal and irrotational vectors and also curvilinear coordinates. |
| CO3 | Demonstrate the idea of Linear dependence and independence of sets in the vector space and linear transformation. |
| CO4 | Apply the knowledge of numerical methods in analyzing the discrete data and solving the physical and engineering problems |
| CO5 | Get familiarize with modern mathematical tools namely MATICA/MATLAB/PYTHON/SCILAB. |

## 3. CO-PO MAPPING MATRIX

| Semester: II | | | | | | | | | | | Year of Study: 2023 - 24 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | P09 | PO10 | PO11 | PO12 |
| CO1 | 2 | 3 | | | | | | | | | | |
| CO2 | 2 | 3 | | | | | | | | | | |
| CO3 | 2 | 3 | | | | | | | | | | |
| CO4 | 2 | 3 | | | | | | | | | | |
| CO5 | 3 | 1 | | | 3 | | | | | | | 2 |

## 4. CO-PO MAPPING JUSTIFICATION

| | Justification |
|---|---|
| CO-1 | **Moderately related to PO1, strongly related to PO2 :** Students are able to solve problems related change of order of integration and change of variables to evaluate multiple integrals and their application in finding the area and volume. |
| CO-2 | **Moderately related to PO1, strongly related to PO2 :** Students apply the knowledge to find solenoidal and irrotational vectors. Also they learn Cartesian, Cylindrical and Spherical systems as curvilinear coordinate system. |
| CO-3 | **Moderately related to PO1, strongly related to PO2:** Students will get the idea of Linear dependence and independence of sets in the vector space and also linear transformation. |
| CO-4 | **Moderately related to PO1, strongly related to PO2:** Students will learn numerical methods in analyzing the discrete data and solving the physical and engineering problems. |
| C0-5 | **Strongly related to PO1, PO5 & moderately related to PO12 :** Students will become familiarize with modern mathematical tool namely Python and apply the mathematical knowledge to understand computer algorithms |

SIR M VISVESVARAYA INSTITUTE OF TECHNOLOGY

BENGALURU - 562157

DEPARTMENT OF MATHEMATICS

**BATCH: 2023-24** **SCHEME: 2022** **SEM: II**

**BRANCH: ECE/EEE/ETE**

## 1. POs CORRELATION

| Sl. No | VTU Course Code | Course Name | POs Correlation |
|---|---|---|---|
| 1 | BMATE201 | MATHEMATICS-II | PO1, PO2 |

## 2. COURSE OUTCOMES (COs)

| Semester: II | Year of Study: 2023-24 |
|---|---|
| CO1 | Understand the applications of vector calculus refer to solenoidal, irrotational vectors, line integral and surface integral. |
| CO2 | Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation |
| CO3 | To understand the concept of Laplace transform and to solve initial value problems. |
| CO4 | Apply the knowledge of numerical methods in analysing the discrete data and solving the physical and engineering problems. |
| CO5 | Familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/ PYTHON/ SCILAB |

## 3. GAP ANALYSIS

| Sl. No | Module NO | CO's | GAP Identified | Action Taken |
|---|---|---|---|---|
| 1 | 1 | CO1 | NIL | NIL |
| 2 | 2 | CO2 | Groups, rings, Integral domain | 1.Traditional board and chalk method. 2. Interactive teaching modes |
| 3 | 3 | CO3 | NIL | NIL |
| 4 | 4 | CO4 | NIL | NIL |
| 5 | 5 | CO4 | NIL | NIL |

## 4. ACTION TAKEN DISCRIPTION

| Sl. No | Action Taken | Description |
|---|---|---|
| 1 | Traditional board and chalk method | Typically for courses which are analytical, have Mathematical derivations, and conceptual developments. Problem Analysis and solution, by giving analogy simplification of concept, stepwise problem solving, highlighting the important terms. |
| 2 | Interactive teaching modes | Such as group discussions, quiz, rigorous assignments are used to improve problem solving capability, critical Thinking, control design and analysing ability. |

**Subject Expert:**

1. Suresh
2.

Professor & Head
Dept. of Mechanical Engineering
Sir M. Visvesvaraya Institute of Technology
Bengaluru-562157

**Signature of HOD**

SIR M VISVESVARAYA INSTITUTE OF TECHNOLOGY, BENGALURU-562157
DEPARTMENT OF MATHEMATICS
ASSIGNMENT - I

SEMESTER: II

BRANCH: COMMON TO ALL BRANCHES

SUBJECT: MATHEMATICS II (BMAT S/C/E/M 201)

DATE OF ANNOUNCEMENT: 17/05/2024

DATE OF SUBMISSION: 30/05/2024

<table>
<tr><th>SL. NO</th><th>QUESTIONS</th><th>CO</th><th>RBT</th></tr>
<tr><td>1.</td><td>Use (a)Newton – Raphson Method (b)Regula- Falsi Method to find the real root of the equation $x^3 + x^2 + 3x + 4 = 0$</td><td>CO4</td><td>L1 & L2</td></tr>
<tr><td>2.</td><td>From the following table find the no of students who have obtained marks between (a) 40 and 45 (b) 70 and 75.
<table>
<tr><td>Marks</td><td>30-40</td><td>40-50</td><td>50-60</td><td>60-70</td><td>70-80</td></tr>
<tr><td>No of Students</td><td>31</td><td>42</td><td>51</td><td>35</td><td>31</td></tr>
</table></td><td>CO4</td><td>L1 & L2</td></tr>
<tr><td>3.</td><td>Construct the interpolating polynomial for the data given below using Newton's divided difference formula
<table>
<tr><td>x</td><td>2</td><td>4</td><td>5</td><td>6</td><td>8</td><td>10</td></tr>
<tr><td>f(x)</td><td>10</td><td>96</td><td>196</td><td>350</td><td>868</td><td>1746</td></tr>
</table></td><td>CO4</td><td>L1 & L2</td></tr>
<tr><td>4.</td><td>Use Lagrange's interpolation formula to fit a polynomial for the given data and hence estimate y at x=2, x=5.
<table>
<tr><td>x</td><td>0</td><td>1</td><td>3</td><td>4</td></tr>
<tr><td>f(x)</td><td>-12</td><td>0</td><td>6</td><td>12</td></tr>
</table></td><td>CO4</td><td>L1 & L2</td></tr>
<tr><td>5.</td><td>Evaluate $\int_0^1 \frac{x}{1+x^2}dx$ by (a) Trapezoidal Rule, (b) Simpson's 1/3rd Rule (c) Simpson's 3/8th rule by taking 7 ordinates and hence find $\log_e 2$.</td><td>CO4</td><td>L1 & L2</td></tr>
<tr><td>6.</td><td>Apply Taylor's series method to find y(0.2) correct to 4 decimal places, given $\frac{dy}{dx} = -xy^2,\ y(0) = 2.$</td><td>CO5</td><td>L1 & L2</td></tr>
<tr><td>7.</td><td>Use Modified Euler's Method to find y in range (0,0.4) by taking h=0.4, given $\frac{dy}{dx} + x^2 = y,\ y(0) = 1.$</td><td>CO5</td><td>L1 & L2</td></tr>
<tr><td>8.</td><td>Solve $(y^2 - x^2)dx = (y^2 + x^2)dy$ for y at x=0.2, given that y=1 at x=0 initially, by applying RK-Method.</td><td>CO5</td><td>L1 & L2</td></tr>
<tr><td>9.</td><td>Given $\frac{dy}{dx} + \frac{y}{x} = \frac{1}{x^2}$ and the data
<table>
<tr><td>x</td><td>1</td><td>1.1</td><td>1.2</td><td>1.3</td></tr>
<tr><td>y</td><td>1</td><td>0.996</td><td>0.986</td><td>0.972</td></tr>
</table>
compute y(1.4) correct to 4 decimal places by applying Milne's Method.</td><td>CO5</td><td>L1 & L2</td></tr>
</table>

QPSC Member

HOD

SIR M VISVESVARAYA INSTITUTE OF TECHNOLOGY

**Department of Mathematics**

**Assignment -II**

**Subject:** MATHEMATICS-II FOR Electrical & Electronics ENGINEERING STREAM

**Subject Code** BMATE201

**Date of Announcement:12/6/2024** **Date of submission:21/6/2024**

| SL NO | Questions | CO's | PO'S | RBT |
|---|---|---|---|---|
| 1 | State the rank-Nullity theorem and verify the theorem for the linear transformation $T: R^3 \rightarrow R^3$ defined by $T(x, y, z) = (x + 2y - z, y + z, x + y - 2z)$ | CO2 | 1 & 2 | L1, L2 |
| 2 | Define linearly independent set of vectors and linearly dependent set of vectors. Are the vectors $V_1 = (2, 5, 3)$, $V_2 = (1, 1, 1)$, and $V_3 = (4, -2, 0)$ linearly independent? Justify your answer | CO2 | 1 & 2 | L1, L2 |
| 3 | Find the dimension and basis of the subspace spanned by the vectors (2, 4, 2), (1, -1, 0), (1, 2, 1), and (0, 3, 1) in $V_3$ (R) | CO2 | 1 & 2 | L1, L2 |
| 4 | Find the Laplace transform of (i)$e^{-3t}$ (2cos5t-3sin5t) (ii) $\frac{cosat-cosbt}{t}$ | CO3 | 1 & 2 | L1, L2 |
| 5 | Find the Laplace transform of the triangular wave function $f(t) = \begin{cases} t & 0 < t \leq a \\ 2a - t & a \leq t \leq 2a \end{cases}$ | CO3 | 1 & 2 | L1, L2 |
| 6 | Using the convolution theorem, find the inverse Laplace transform of $\frac{s}{(s^2+a^2)^2}$ | CO3 | 1 & 2 | L1, L2 |
| 7 | Solve by Laplace transform method: $y'' + 4y' + 3y = e^{-t}$, given $y(0) = y'(0) = 1$ | CO3 | 1 & 2 | L1, L2 |
| 8 | Verify Stoke's theorem for $\vec{F} = (x^2 + y^2)\hat{i} - 2xy\,\hat{j}$ taken round the rectangle bounded by the lines $x = \pm a$, $y = 0$ and $y = b$. | CO1 | 1 & 2 | L1, L2 |
| 9 | Define a solenoidal vector. Find the value of 'a' for which $\vec{F} = (x+3y)\hat{i} + (y-2z)\hat{j} + (x+az)\hat{k}$ is solenoidal | CO1 | 1 & 2 | L1, L2 |
| 10 | If $\vec{F} = \nabla(xy^3z^2)$ find $div\vec{F}$ and $curl\vec{F}$ at the point (1, -1, 1) | CO1 | 1 & 2 | L1, L2 |

Verified by QPSC member

Approved by HOD

Date 13 05 2024 Subject Code BMATE/C/S/M201

USN 1 M V

**Sir M. Visvesvaraya Institute of Technology**
**Bangalore 562 157**
**INTERNAL TEST PAPER**

TEST NO : 1 SEM : 2 COURSE / BRANCH : BE / ALL BRANCHES MAX. MARKS : 25 DURATION : 60 Mins

SUBJECT : Mathematics II Faculty Name : UMA S

**Instructions: Answer any one Question from each PART**

BL – Bloom's Taxonomy Levels (1- Remembering, 2- Understanding, 3 – Applying, 4 – Analyzing, 5 – Evaluating, 6 - Creating)
CO – Course Outcomes PO – Program Outcomes; PI – Performance Indicator

| Q. No | Question | Marks | CO | BL | PO | PI |
|---|---|---|---|---|---|---|
| | **PART A** | | | | | |
| 1 | a) Find a real root of equation $xe^x - 2 = 0$ in the interval (0,1) correct to three decimal places by Newton Raphson method | 6 | CO4 | L1&L2 | P1&P2 | 2.1.3 |
| | b) From the following table find the number of students who have obtained a) less than 45 marks b) between 40 & 45 marks<br>Marks: 30-40 \| 40-50 \| 50-60 \| 60-70 \| 70-80<br>No. of students: 31 \| 42 \| 51 \| 35 \| 31 | 6 | CO4 | L1&L2 | P1&P2 | 1.1.1 |
| | **OR** | | | | | |
| 2 | a) Use Newton's Divided difference formula to fit an interpolating polynomial for the following table<br>x: 0 \| 1 \| 2 \| 5<br>y: 2 \| 3 \| 12 \| 147 | 6 | CO4 | L1&L2 | P1&P2 | 2.1.3 |
| | b) Evaluate $\int_0^1 \frac{dx}{1+x}$ taking seven ordinates by applying Simpson's $\frac{3}{8}th$ rule . Hence deduce the value of $\log_e 2$ | 6 | CO4 | L1&L2 | P1&P2 | 1.1.1 |
| | **PART B** | | | | | |
| 3 | a) Use Taylor's series method to find y at x=0.1,0.2,0.3 considering terms upto the third degree given that $\frac{dy}{dx} = x^2 + y^2$ and y(0)=1 | 6 | CO5 | L1&L2 | P1&P2 | 1.1.1 |
| | b) Use Modified Euler's method to compute y(0.1) correct to 3 decimal places, given that $\frac{dy}{dx} = x^2 + y$, y(0)=1 | 7 | CO5 | L1&L2 | P1&P2 | 1.1.1 |
| | **OR** | | | | | |
| 4 | a) Given $\frac{dy}{dx} = 3x + \frac{y}{2}$; y(0)=1 compute y(0.2) by taking h=0.2 using Runge-kutta method of fourth order. | 6 | CO5 | L1&L2 | P1&P2 | 1.1.1 |
| | b) Apply Milne's method to compute y(1.4) correct to four decimal places given that $\frac{dy}{dx} = x^2 + \frac{y}{2}$ & the data y(1)=2, y(1.1)=2.2156, y(1.2)=2.4649, y(1.3)=2.7514 | 7 | CO5 | L1&L2 | P1&P2 | 1.1.1 |

CO4; Apply the knowledge of numerical methods in solving physical and engineering phenomena.
CO5 :Get familiarize with modern mathematical tools namely Mathematica/MatLab/Python/Scilab

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QPSC Member

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HOD

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Bengaluru 562 157

## Scheme and Solution

**Subject Title :** Mathematics II **Subject code:** BMATE|S|20

| Question No. | Solution | Marks Allocated |
|---|---|---|
| 1. (a) | $f(0) = -2 < 0$ $f(1) = 0.7183 > 0$, $x_0 = 1$. — (1) M<br>$x_1 = x_0 - \frac{f(x_0)}{f'(x_0)} = 0.8679$<br>$x_2 = 0.8528$, $x_3 = 0.8526$, $x_4 = 0.8526$<br>→ (5) M | 6 Mark |
| (b) | Table | |

| $x$ | $f(x)$ | $\Delta y$ | $\Delta^2 y$ | $\Delta^3 y$ | $\Delta^4 y$ |
|---|---|---|---|---|---|
| 40 | 31 | 42 | 9 | -25 | 37 |
| 50 | 73 | 51 | -16 | 12 | |
| 60 | 124 | 35 | -4 | | |
| 70 | 159 | 31 | | | |
| 80 | 190 | | | | |

(4)

NFIF is given by

$$y_x = y_0 + x\Delta y_0 + \frac{x(x-1)}{2}\Delta^2 y_0 + \frac{x(x-1)(x-2)}{3}\Delta^3 y_0 + \frac{x(x-1)(x-2)(x-3)}{4}\Delta^4 y_0, \quad x = 0.5$$

(01)

$= 48$

(b) Bet 40 & 45 marks, $f(45) - f(40) = 48 - 31 = 17$. (01)

6 marks

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Bengaluru 562 157

## Scheme and Solution

**Subject Title :** **Subject code:**

| Question No. | Solution | Marks Allocated |
|---|---|---|

**2. a** Table

| $x$ | $f(x)$ | F.D.D | S.D.D | T.D.D |
|---|---|---|---|---|
| 0 | 2 | 1 | 4 | 1 |
| 1 | 3 | 9 | 9 | |
| 2 | 12 | 15 | | |
| 5 | 147 | | | |

(4)

$f(x) = f(x_0) + (x-x_0) f(x_0 x_1) + (x-x_0)(x-x_1) f(x_0 x_1 x_2) + (x-x_0)(x-x_1)(x-x_2) f(x_0 x_1 x_2 x_3)$

$= x^3 + x^2 - x + 2$ (2)

6 marks

**(b)** Simpson's 3/8th rule i/s

$\int y\,dx = \frac{3h}{8}\left[(y_0+y_6) + 3(y_1+y_2+y_4+y_5) + 2y_3\right]$ → (1)

| $x$ | 0 | 1/6 | 2/6 | 3/6 | 4/6 | 5/6 | 6/6 |
|---|---|---|---|---|---|---|---|
| $y$ | 1 | 6/7 | 3/4 | 2/3 | 3/5 | 6/11 | 1/2 |

(3)

Sub $\int_0^1 \frac{1}{1+x}\,dx = 0.6932$ → (2) & $\log_e 2 = 0.6932$ (1)

6 marks

**3. a** Taylor's series i/s

$y(x) = y(x_0) + (x-x_0)\,y'(x_0) + \frac{(x-x_0)^2}{\lfloor 2}\,y''(x_0) + (x-x_0)^3/\lfloor 3\; y'''(x_0)$ — (1)

$y'(0) = 1, \quad y''(0) = 2 \quad y'''(0) = 8$ → (3)

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**Bengaluru 562 157**

## Scheme and Solution

**Subject Title :** **Subject code:**

| estion | Solution | Marks Allocated |
|---|---|---|
| | Sub $y = 1 + x + x^2 + 4x^3/3$ — (1) | 6 marks |
| | $y(0.1) = 1.1113$, $y(0.2) = 1.2507$, $y(0.3) = 1.426$ — (1) | |
| (b) | Euler's formula is $y_1^{(0)} = y_0 + hf(x_0, y_0)$ $= 1.1$ — (2) | |
| | Modified Euler's formula is $y_1 = y_0 + h/2[f(x_0, y_0) + f(x_1, y_1)]$ — (5) | 7 marks |
| | $y_1^{(1)} = 1.1055$ $y_1^{(2)} = 1.1057$. $\therefore y_1 = 1.105$ at $x_1 = 0.1$ | |
| + (a) | $K_1 = 0.1$, $K_2 = 0.165$, $K_3 = 0.16825$ | |
| | $K_4 = 0.236825$, $K = 0.1672208$ — (4) marks | 6 marks |
| | $y_1 = 1.1672208$ at $x_1 = 0.2$ | |
| | → (2) marks | |
| ( b) | Table | |

| $x$ | $y$ | $y' = x^2 + y/2$ |
|---|---|---|
| 1 | 2 | 2 |
| 1.1 | 2.2156 | 2.3178 |
| 1.2 | 2.4649 | 2.67245 |
| 1.3 | 2.7514 | 3.0657 |
| 1.4 | $y_4$ | |

→ (1)

$y_4^{(P)} = y_0 + \frac{4h}{3}[2y_1' - y_2' + 2y_3']$

$= 3.0793$ — (1)

By corrector formula

$y_4^{(1)} = y_2 + \frac{h}{3}(y_2' + 4y_3' + y_4')$

$= 3.0794$

$y_4^{(2)} = 3.0794$

→ (4)

7 marks

Date 21 08 2023

Subject Code 22MATC/M/S 201

USN 1 M V

**Sir M. Visvesvaraya Institute of Technology**
**Bangalore 562 157**
**INTERNAL TEST PAPER**

TEST NO : 2 SEM : 2 COURSE / BRANCH : BE / CS/IS/ME/CV/BT MAX. MARKS : 25 DURATION : 60 Mins

SUBJECT : Mathematics II Faculty Name : UMA S

**Instructions: Answer any one Question from each PART**

BL – Bloom's Taxonomy Levels (1- Remembering, 2- Understanding, 3 – Applying, 4 – Analyzing, 5 – Evaluating, 6 - Creating)
CO – Course Outcomes PO – Program Outcomes; PI – Performance Indicator

| Q. No | Questions | Marks | CO | BL | PO | PI |
|---|---|---|---|---|---|---|
| | **PART A** | | | | | |
| 1 | a) Evaluate $\iint (x^2+y^2)dxdy$ over the region in the positive quadrant for which $x+y \le 1$. | 6 | CO1 | L1&L2 | P1&P2 | 2.1.3 |
| | b) Evaluate $\int_0^{4a} \int_{x^2/4a}^{2\sqrt{ax}} dydx$ by changing the order of integration . | 6 | CO1 | L1&L2 | P1&P2 | 1.1.1 |
| | **OR** | | | | | |
| 2 | *a*)Find by double integration the area enclosed by the curve $r = a(1+\cos\theta)$ *between* $\theta = 0$ *and* $\theta = \pi$ . | 6 | CO1 | L1&L2 | P1&P2 | 2.1.3 |
| | *b*) Prove that $\beta(m,n) = \frac{\tau(m)\tau(n)}{\tau(m+n)}$ | 6 | CO1 | L1&L2 | P1&P2 | 1.1.1 |
| | **PART B** | | | | | |
| 3 | a)Find directional derivative of $\frac{xz}{x^2+y^2}$ at (1,-1,1) in the direction of vector i-2j+k | 6 | CO2 | L1&L2 | P1&P2 | 1.1.1 |
| | b) *Find div* $\vec{F}$ *and curl* $\vec{F}$ where $\vec{F} = \nabla(x^3+y^3+z^3-3xyz)$ | 7 | CO2 | L1&L2 | P1&P2 | 1.1.1 |
| | **OR** | | | | | |
| 4 | a) Find constants a,b,c such that vector field (sin y + az ) i + (bx cos y + z) j + (x + cy) k is irrotational also find $\vec{F} = \nabla\emptyset$ | 6 | CO2 | L1&L2 | P1&P2 | 1.1.1 |
| | b) $\vec{F} = x^2y\ i + yz^2\ j + zx^2\ k$ find curl ( curl $(\vec{F})$) | 7 | CO2 | L1&L2 | P1&P2 | 1.1.1 |

CO1: Apply the knowledge of multiple integrals to compute area and volume.
CO2: Understand the applications of vector calculus refer to solenoidal, irrotational vectors, line integral and surface integral.
CO3: Demonstrate the idea of Linear dependence and independence of sets in the vector space and linear transformation
CO4: Apply the knowledge of numerical methods in solving physical and engineering phenomena.
CO5: Get familiarize with modern mathematical tools namely Mathematica/MatLab/Python/Scilab

**Verified by**
**QPSC Member**

**Approved By**
**HOD**

Sir M Visvesvaraya Institute of Technology
Bengaluru 562 157

Scheme and Solution

Subject Title : Mathematics - II for EEE Stream Subject code: BMATE201

| Question No. | Solution | Marks Allocated |
|---|---|---|
| | Part - A | |
| 1 (a) | D.D of $\phi$ along $\vec{a}$ $= \nabla\phi \cdot \hat{a}$ where $\hat{a} = \frac{\vec{a}}{\lvert\vec{a}\rvert}$ | 1M |
| | Given, $\phi = x^2yz + 4xz^2$ | |
| | $\nabla\phi = \frac{\partial\phi}{\partial x}\hat{i} + \frac{\partial\phi}{\partial y}\hat{j} + \frac{\partial\phi}{\partial z}\hat{k}$ | 2M |
| | $= (2xyz + 4z^2)\hat{i} + (x^2z)\hat{j} + (x^2y + 8xz)\hat{k}$ | 2M |
| | $[\nabla\phi]_{(1,-2,-1)} = 8\hat{i} - \hat{j} - 10\hat{k}$ | |
| | $\hat{a} = \frac{\vec{a}}{\lvert\vec{a}\rvert} = \frac{2\hat{i} - \hat{j} - 2\hat{k}}{3}$ $\therefore \nabla\phi \cdot \hat{a} = \frac{37}{3}$ | 1M |
| 1 (b) | $\nabla \times \vec{F} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ (axy - z^3) & (a-2)x^2 & (1-a)xz^2 \end{vmatrix} = \vec{0} \Rightarrow a = 4$ | 2M |

P.Q No: 01

Sir M Visvesvaraya Institute of Technology
Bengaluru 562 157

## Scheme and Solution

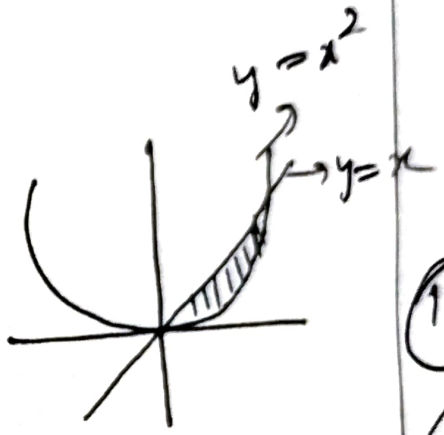
**Subject Title :** Mathematics-II for EEE Stream **Subject code:** BMATE201

| Question No. | Solution | Marks Allocated |
|---|---|---|
| (1) (b) | Given, $\nabla\phi = \vec{F}$<br>$\frac{\partial\phi}{\partial x}\hat{i} + \frac{\partial\phi}{\partial y}\hat{j} + \frac{\partial\phi}{\partial z}\hat{k} = (4xy - z^3)\hat{i} + 2x^2\hat{j} - 3xz^2\hat{k}$<br>$\Rightarrow$<br>$\frac{\partial\phi}{\partial x} = 4xy - z^3$ \| $\frac{\partial\phi}{\partial y} = 2x^2$ \| $\frac{\partial\phi}{\partial z} = -3xz^2$<br>$\phi = 2x^2y - xz^3 + f_1(y,z)$ \| $\phi = 2x^2y + f_2(x,z)$ \| $\phi = -xz^3 + f_3(x,y)$<br>$f_1(y,z) = 0$ ; $f_2(x,z) = -xz^3$ ; $f_3(x,y) = 2x^2y$<br>$\boxed{\phi = 2x^2y - xz^3}$ | 4M |
| (2) (a) | $\nabla \cdot \vec{A} = \frac{\partial a_1}{\partial x} + \frac{\partial a_2}{\partial y} + \frac{\partial a_3}{\partial z}$ | 1M |

**Scheme and Solution**

**Subject Title :** Mathematics-II for EEE Stream **Subject code:** BMATE201

| Question No. | Solution | Marks Allocated |
|---|---|---|
| 2 (a) | $\nabla \cdot \vec{A} = z^3 - 2x^2 z + 8y z^3$ ; $(\nabla \cdot \vec{A})_{(1,-1,1)} = -9$ | 1M |
| | $\nabla \times \vec{A} = 2(z^4 + x^2 y)\hat{i} + 3xz^2\hat{j} - 4xyz\hat{k}$ | 2M |
| | $(\nabla \times \vec{A})_{(1,-1,1)} = 3\hat{j} + 4\hat{k}$ <br> $\nabla \cdot (\nabla \times \vec{A}) = 0$ | 2M |
| 2 (b) | $M = xy + y^2$ & $N = x^2$ <br> $\frac{\partial M}{\partial y} = x + 2y$ & $\frac{\partial N}{\partial x} = 2x$ <br> $(0,0)$ & $(1,1)$ pt of intersection <br> $I = \int_{x=0}^{1} \int_{y=x^2}^{y=x} [2x - x - 2y]\, dx\, dy = \frac{-1}{20}$ <br> $\oint_C M dx + N dy = \iint_R \left(\frac{\partial N}{\partial x} - \frac{\partial M}{\partial y}\right) dx\, dy$ | 1M <br> 2M <br> 3M |



Scheme and Solution

Subject Title : Mathematics-II for EEE Stream Subject code: BMATE301

| Question No. | Solution | Marks Allocated |
|---|---|---|
| 3 (a) | (i) $L\left\{\frac{\cos 6t - \cos 4t}{t}\right\} = \int_s^\infty \left[\frac{s}{s^2+36} - \frac{s}{s^2+16}\right] ds$ | 1M |
| | $= \frac{1}{2}\int_s^\infty \left[\frac{2s}{s^2+36} - \frac{2s}{s^2+16}\right] ds$ | 1M |
| | $= \frac{1}{2}\left\{\log(s^2+36) - \log(s^2+16)\right\}_{s=s}^{\infty}$ | 1M |
| | $= \frac{1}{2}\left\{\log\left(\frac{s^2+36}{s^2+16}\right)\right\}_{s=s}^{\infty}$ | 3M |
| | $= \frac{1}{2}\lim_{s\to\infty} \log\left(\frac{s^2+36}{s^2+16}\right) - \log\left(\frac{s^2+36}{s^2+16}\right)$ | |
| | $= -\frac{1}{2}\log\left(\frac{s^2+36}{s^2+16}\right) = \log\sqrt{\frac{s^2+16}{s^2+36}}$ | |

## Scheme and Solution

**Subject Title :** Mathematics – II for EEE stream **Subject code:** BMATE201

| Question No. | Solution | Marks Allocated |
|---|---|---|
| 3 (a) | (ii) $\int_0^\infty e^{-2t}[t\sin 4t]\,dt = \mathcal{L}\{t\sin 4t\}$ — (1) | 1M |
| | $\mathcal{L}\{t\sin 4t\} = (-1)\frac{d}{ds}\{\mathcal{L}[\sin 4t]\}$ | |
| | $= (-1)\frac{d}{ds}\left\{\frac{4}{s^2+16}\right\} = \left[\frac{8s}{(s^2+16)^2}\right]$ | 1M |
| | $\therefore$ (1) $\Rightarrow$ $\int_0^\infty e^{-2t}[t\sin 4t]\,dt = \frac{16}{400} = \frac{1}{25}$ | 1M |
| 3 (b) | $\mathcal{L}\{f(t)\} = \frac{1}{1-e^{-sa}}\int_0^a e^{-st} f(t)\,dt$ | 1M |
| | here, $T = a$ | |

$$L\{f(t)\} = \frac{1}{1-e^{-as}} \left\{ \int_0^{a/2} e^{-st} E\,dt + \int_{a/2}^{a} e^{-st}(-E)\,dt \right\}$$

$$= \frac{E}{1-e^{-as}} \left\{ \left[ \frac{e^{-st}}{-s} \right]_0^{a/2} + \left[ \frac{e^{-st}}{s} \right]_{a/2}^{a} \right\} \quad (5m)$$

$$= \frac{E(1-2e^{-as/2}+e^{-as})}{(1-e^{-as})s} = \frac{E(1-e^{-as/2})}{s(1+e^{-as/2})}$$

$$= \frac{E}{s}\left( \frac{e^{as/4} - e^{-as/4}}{e^{as/4} + e^{-as/4}} \right) = \frac{E}{s} \tanh\left(\frac{as}{4}\right) \quad \text{---}$$

(4) (a) (i) $L^{-1}\left\{ \frac{s+5}{s^2-6s+13} \right\} = L^{-1}\left\{ \frac{s+5}{(s-3)^2+4} \right\}$ (1m)

$$= L^{-1}\left\{ \frac{(s-3)+8}{(s-3)^2+2^2} \right\} = L^{-1}\left\{ \frac{(s-3)}{(s-3)^2+2^2} \right\} + L^{-1}\left\{ \frac{8}{(s-3)^2+2^2} \right\}$$

$$= e^{3t} L^{-1}\left\{ \frac{s}{s^2+2^2} \right\} + 8e^{3t} L^{-1}\left\{ \frac{s}{s^2+2^2} \right\} \quad (5m)$$

$$= e^{3t}\{\cos 2t + 4\sin 2t\}$$

(4) (a) (i) $L^{-1}\left\{\frac{(s+2)^3}{s^6}\right\} = L^{-1}\left\{\frac{s^3+6s^2+12s+8}{s^6}\right\}$ (1M)

$= L^{-1}\left\{\frac{1}{s^3}\right\} + 6L^{-1}\left\{\frac{1}{s^4}\right\} + 12L^{-1}\left\{\frac{1}{s^5}\right\} + 8L^{-1}\left\{\frac{1}{s^6}\right\}$

$= \frac{t^2}{2!} + 6\left(\frac{t^3}{3!}\right) + 12\left(\frac{t^4}{4!}\right) + 8\left(\frac{t^5}{5!}\right)$

$= \frac{t^2}{2} + t^3 + \frac{t^4}{2} + \frac{t^5}{15}$ (4M)

(4) (b) $L\{y''(t) + 6y'(t) + 9y(t)\} = 12L\{t^2 e^{-3t}\}$

$[s^2L\{y(t)\} - sy(0) - y'(0)] + 6[sL\{y(t)\} - y(0)]$

$+ 9L\{y(t)\} = 12 \cdot \frac{2!}{(s+3)^2}$ (1M)

$(s^2+6s+9)L\{y(t)\} = \frac{24}{(s+3)^2}$ (3M)

$\Rightarrow L\{y(t)\} = \frac{24}{(s+3)^5}$ (a) $y(t) = L^{-1}\left\{\frac{24}{(s+3)^5}\right\}$

$\Rightarrow y(t) = 24e^{-3t}L^{-1}\left\{\frac{1}{s^5}\right\} = 24 \cdot e^{3t}\frac{t^4}{4!}$ (2M)

$\Rightarrow \boxed{y(t) = e^{-3t}t^4}$

# SIR M. VISVESVARAYA INSTITUTE OF TECHNOLOGY
## BANGALORE -562157

## FAST LEARNERS

**Department:** Mathematics

**Date:**

**Subject :** Mathematics -II for EE Stream
**Subject Code:** BMATE201

**Semester:** II

| SL.NO | USN | NAME OF THE STUDENT | SIGNATURE |
|---|---|---|---|
| 1 | 1MV23EE005 | Ambika Shatagar | Ambika |
| 2 | 012 | Baireddy Kalyani | Baireddy Kalyani |
| 3 | 013 | Bharat M Harasi | |
| 4 | 023 | Gayatri | |
| 5 | 029 | Lakshmi H Gowda | |
| 6 | 032 | Maanya S | |
| 7 | 036 | Mustafa Bohra | |
| 8 | 038 | Nandini Apaar | |
| 9 | 039 | Nandini Arkachari | |

**Topics covered:**

(1) Solved Model Q.P & previous years Q.P problems
(2) Demonstrated real world applications of vector Calculus, & numerical methods
(3) Applied L.T to solve problems related to Electrical & Electronics stream

**Faculty In-charge:** SHUBA · R · N
**Designation:** Assistant Professor
**Signature:** Shuba · R · N.

# SIR M. VISVESVARAYA INSTITUTE OF TECHNOLOGY
## BANGALORE -562157

### Remedial classes for slow learners

**Department: Mathematics** **Date:**

**Subject :** Mathematics-II for EEE Stream
**Subject Code: BMATE201**

**Semester: II**

| SL.NO | USN | NAME OF THE STUDENT | SIGNATURE |
|---|---|---|---|
| 1 | 1MV23EE001 | ACHAL CHOURASIYA | |
| 2 | 1MV23EE008 | ARYA M | |
| 3 | 1MV23EE009 | ARYA PRASAD S | |
| 4 | 1MV23EE010 | ARYAN ANILRAO DESALE | |
| 5 | 1MV23EE020 | DILEEP L | |
| 6 | 1MV23EE022 | G K SPOORTHI | |
| 7 | 1MV23EE024 | GIRISH T P | |
| 8 | 1MV23EE025 | HEMANTH K D | |
| 9 | 1MV23EE026 | JEEVAN | |
| 10 | 1MV23EE030 | LAVANYA R | |
| 11 | 1MV23EE033 | MAHAMMAD ANEEF M | |
| 12 | 1MV23EE035 | MAYANK KUMAR | |
| 13 | 1MV23EE047 | NITISH KUMAR | |

**Topics covered:**

1. **Numerical methods-I**
2. **Numerical methods-II**
3. **Vector Calculus**
4. **Vector Spaces**

**Faculty In-charge:** SHUBA R.N
**Designation:** Assistant Professor
**Signature:** Shuba R.N

# Mathematics-II
# Question bank for Electrical Stream
# (BMATE201)

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## Module 1

## VECTOR CALCULUS

1. Find the directional derivative of $\phi=x^2yz+4xz^2$ at (1,2,-1) along $2i - j - 2k$.
2. Find divergence $\vec{F}$ and curl $\vec{F}$ if $\vec{F}$= grad($x^3+y^3+z^3-3xyz$)
3. Find the angle between surfaces $x^2+y^2+z^2 = 9$ and $z = x^2+y^2-3$ at point (2,-1,2)
4. Show that the vector field $\vec{F} = \frac{x\hat{\imath}+y\hat{\jmath}}{x^2+y^2}$ is both solenoidal & irrotational.
5. Find the constants a and b such that $\vec{F} = (axy + z^3)\hat{\imath} + (3x^3 - z)\hat{\jmath} + (bxz^2 - y)\hat{k}$ is irrotational. Also find a scalar potential $\vec{F} = \nabla\emptyset$.
6. If $\vec{F} = (x + y + 1)\vec{\imath} + \vec{\jmath} - (x + y)k$ show that $\vec{F}.curl\vec{F} = 0$.
7. If $\vec{F} = (x + y + az)\hat{\imath} + (bx + 2y - z)\hat{\jmath} + (x + cy + 2z)\hat{k}$ find a,b,c such that $\vec{F}$ is irrotational.Hence find the scalar potential $\emptyset$ such that $\vec{F} = \nabla\emptyset$.
8. If $\vec{f} = x^2\vec{\imath} + y^2\vec{\jmath} + z^2\vec{k}$ and $\vec{g} = yz\vec{\imath} + zx\vec{\jmath} + xy\vec{k}$ then verify whether $\vec{f} \times \vec{g}$ is solenoidal or not.
9. Show that $\vec{F} = \left(6xy + z^3\right)i + \left(3x^2 - z\right)j + \left(3xz^2 - y\right)k$ is irrational, find $\varphi$ such that $\vec{F} = \nabla\varphi$.
10. If $\vec{V} = 3xy^2z^2\vec{\imath} + y^3z^2\vec{\jmath} - 2y^2z^3\vec{k}$ and $\vec{F} = (x^2 - yz)i + (y^2 - zx)j + (z^2 - xy)k$, then prove that $\vec{V}$ is solenoidal and F is irrotational.

## VECTOR INTEGRATION

1. If $\vec{F} = (3x^2 + 6y)\hat{\imath} - 14yz\hat{\jmath} + 20xz^2\hat{k}$, evaluate $\int_C \vec{F}.d\vec{r}$ from (0, 0, 0) to (1,1,1) along the curve given by $x = t, y = t^2, z = t^3$
2. If $\vec{F} = xy\,\hat{\imath} + yz\,\hat{\jmath} + zx\,\hat{k}$ evaluate $\int_C \vec{F}.d\vec{r}$ where C is the curve represented by $x = t, y = t^2,\ z = t^3, -1 \le t \le 1$.
3. Find the total work done in moving a particle in the force field $\vec{F} = 3xy\hat{\imath} - 5z\hat{\jmath} + 10x\hat{k}$ along the curve $x = t^2 + 1$, $y = 2t^2$, $z = t^3$ from t=1 to t=2

# MODULE 2

# VECTOR SPACES AND LINEAR TRANSFORMATIONS

1. Prove that the subset W= {(x,y,z) | x-3y+4z=0} of the vector space $R^3$ is a subspace of $R^3$.
2. Determine whether the matrix $\begin{bmatrix} -1 & 7 \\ 8 & -1 \end{bmatrix}$ is a linear combination of $\begin{bmatrix} 1 & 0 \\ 2 & 1 \end{bmatrix}$, $\begin{bmatrix} 2 & -3 \\ 0 & 2 \end{bmatrix}$ and $\begin{bmatrix} 0 & 1 \\ 2 & 0 \end{bmatrix}$ in the vector space M of 2×2 matrices.
3. Find the matrix of the linear transformation $T: V_2(R) \rightarrow V_3(R)$ such that T(-1,1) = (-1,0,2) and T(2,1) = (1,2,1).
4. Show that the set S = {(1,2,4), (1,0,0), (0,1,0), (0,0,1)} is linearly dependent.
5. Let $P_n$ be the vector space of real polynomial functions of degree ≤ n. show that the transformation $T: P_2 \rightarrow P_1$ defined by $T(ax^2 + bx + c) = (a + b)x + c$ is linear.
6. Verify Rank- Nullity theorem for the linear transformation $T: V_3(R) \rightarrow V_2(R)$ defined by T( x, y, z) = (y-x, y-z).
7. Find the basis and dimension of the subspace spanned by the vectors {(2,4,2), (1,-1,0), (1,2,1), (0,3,1)} in $V_3(R)$.
8. Find the kernel and the range of the linear operator T(x,y,z) = (x+y, z) of $R^3$ to $R^2$.
9. Let V= $R^3$ be a vector space and consider the subset W of V consisting of vectors of the form ( a, $a^2$, b), where the second component is the square of the first. Is W a subspace of V?
10. Let $f(x)= 2x^2 - 5$ and g(x) = x + 1. Show that the function $h(x) = 4x^2 + 3x - 7$ lies in the subspace span {f,g} of $P_2$.
11. Prove that the transformation $T: V_2(R) \rightarrow V_2(R)$ defined by T(x, y) = (3x, x+y) is linear. Find the images of the vectors (1,3) and (-1,2) under this transformation.
12. Find the linear transformation $T: V_2(R) \rightarrow V_2(R)$ such that T(1,2) = (3,0) and T(2,1) = (1,2).
13. Find the linear transformation $T: V_2(R) \rightarrow V_3(R)$ such that T(-1,1) = (-1,0,2) and T(2,1) = (1,2,1).

# MODULE -3
# LAPLACE TRANSFORMS AND INVERSE LAPLACE TRANSFORMS

**1.** Find the Laplace Transform of Square wave function of period 2a defined by

$$f(t)=\begin{cases} K, & 0<t<a \\ -K, & a<t<2a \end{cases} \text{ S.T. } L\{f(t)\}=\frac{K}{S}\tanh\left(\frac{as}{2}\right)$$

**2.** Find the Laplace Transform of (i)$\left(\frac{4t+5}{e^{2t}}\right)^2$ (ii) $\left(\frac{\sin 2t}{\sqrt{t}}\right)^2$ (iii)tcosat

**3.** Express $f(t)=\begin{cases} 1 & if \quad 0<t\le 1 \\ t & if \quad 1<t\le 2 \\ t^2 & if \quad t>2 \end{cases}$ in terms of Unit Step function and

hence find $L\{f(t)\}$

**4.**Find the Laplace Transform of $\frac{e^{-t}\sin t}{t}$ and hence deduce that $\int_0^\infty \frac{e^{-t}\sin t}{t}dt=\frac{\pi}{4}$

**5.**Express $f(t)$ in terms of Unit Step function and hence find the L.T given that

$$f(t)=\begin{cases} t^2, & 0<t<2 \\ 4t, & 2<t<4 \\ 8, & t>4 \end{cases}$$

**6.**Find the Laplace Transform of i) $2^t+\frac{\cos 2t-\cos 3t}{t}+t\sin t$

**7.** Find $L^{-1}\left\{\log\frac{s+1}{s-1}\right\}$

**8.**Find $L^{-1}\left\{\tan^{-1}\left(\frac{2}{s^2}\right)\right\}$

9.Find $L^{-1}\left\{\frac{1}{(s+1)^2(s+2)}\right\}$ using Convolution Theorem

10. Find $L^{-1}\left\{\frac{s}{(s^2+1)(s^2+4)}\right\}$ using Convolution Theorem

11. Find $L^{-1}\left\{\frac{5s+3}{(s-1)(s^2+2s+5)}\right\}$

12.Find $L^{-1}\left\{\frac{2s^2-6s+5}{s^3-6s^2+11s-6}\right\}$

13.Solve $y''+4y'+4y=e^t$ with $y(0)=0=y'(0)$ using Laplace Transform

14. Solve $y'''+2y''-y'-2y=0$ with $y(0)=0=y'(0)$ ,$y''(0)=6$ using LT

15.Solve $y''+6y'+9y=12t^2e^{-3t}$ with $y(0)=0=y'(0)$ using LT

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# Module 4

## Numerical Methods – I

### Type 1 : Finding root by Regula falsi method (correct to 4 decimal places) – Practice 2 – 4 more problems

**a.** $xe^x = 2$ **b.** $x \log_{10} x = 1.2$ **c.** $xe^x = \cos x$

### Type 2 : Finding root by Newton Raphson method (correct to 4 decimal places) – Practice 2 – 4 more problems

**a.** $\tan x - x = 0$ $(near\ x = 4.5)$ **b.** $xe^x = 2$

**c.** $x \sin x + \cos x = 0$ **d.** $3x - 1 = \cos x$

### Type 3 : Newton's forward and backward interpolation – Practice more problems

**a.** The population of a town given by the table

| Year | 1951 | 1961 | 1971 | 1981 | 1991 |
|---|---|---|---|---|---|
| Population in thousands | 19.96 | 39.65 | 58.81 | 77.21 | 94.61 |

Using Newton forward and backward interpolation formula, calculate the increase in population from the year 1955 to 1985

**b.** From the following table estimate the number of students who obtained marks between 40 and 45:

| Marks | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 |
|---|---|---|---|---|---|
| No. of students | 31 | 42 | 51 | 35 | 31 |

**c.** Given $\sin 45^0 = 0.7071, \sin 50^0 = 0.7660,\ \sin 55^0 = 0.8192, \sin 60^0 = 0.8660$, find $\sin 57^0$ using an appropriate interpolation formula.

**d.** Using suitable interpolation formula find y(82) and y(98) for the following data:

| x | 80 | 85 | 90 | 95 | 100 |
|---|---|---|---|---|---|
| y | 5026 | 5674 | 6362 | 7088 | 7854 |

## Type 4 : Newton's divided difference interpolation – Practice more problems

**a.** Construct the interpolation polynomial for the data given below using Newton's divided difference formula:

| x | 2 | 4 | 5 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| y | 10 | 96 | 196 | 350 | 868 | 1746 |

**b.** Fit interpolating polynomial for f(x) using Newton's divided difference formula, given

| x | 0 | 1 | 4 | 8 | 10 |
|---|---|---|---|---|---|
| y | -5 | -14 | -125 | -21 | 355 |

Hence evaluate f(2)

**c.** Using Newton's divided difference formula, evaluate f(8) and f(15) given:

| x | 4 | 5 | 7 | 10 | 11 | 13 |
|---|---|---|---|---|---|---|
| y | 48 | 100 | 294 | 900 | 1210 | 2028 |

## Type 5 : Lagrange's interpolation – Practice more problems

**a.** Use Lagrange's interpolation formula to find the interpolating polynomial that approximate the function described by the following table. Hence find f(4)

| x | 0 | 1 | 2 | 5 |
|---|---|---|---|---|
| y | 2 | 3 | 12 | 147 |

# Module 5
## Numerical methods-2

1. Use Taylor's series method to find y at x=0.1, 0.2 considering terms up to third degree given $\frac{dy}{dx} = x^2 + y^2$ and y (0) =1.
2. Use Taylor's series method to find y at x=1.1, 1.2 considering terms up to third degree given $\frac{dy}{dx} = x + y$ and y (1) =0.
3. Find y at x=0.1 correct to 4 decimal places given $\frac{dy}{dx} = x - y^2$; y (0) =1 applying Taylor's series method up to fourth degree terms.
4. Use Taylor's series method to find y at x=0.1 and 0.2 to five placed of decimals given $\frac{dy}{dx} = x^2y - 1$, y (0) =1.
5. Employ Taylor's series method to obtain approximate value of y at x = 0.2 for the differential equation $\frac{dy}{dx} = 2y + 3e^x$; y (0) = 0 compare numerical solution obtained with exact solutions.
6. Use Euler's method solve $\frac{dy}{dx} = x^2 + y^2$ and y (0) =1, for x=0.1(0.2)1.0
7. Given $\frac{dy}{dx} = \frac{y-x}{y+x}$, with y (0) =1. Find y approximately for x=0.1 by Euler's method in five steps.
8. Using Euler's modified method, find y (0.2) given $\frac{dy}{dx} = x - y^2$; y (0) =1, taking h=0.1
9. Using modified Euler's method to compute y (0.1), given $\frac{dy}{dx} = x^2 + y$, y (0) =1 by taking h=0.05 considering accuracy unto two approximations in each step.
10. Using Euler's modified method, $\frac{dy}{dx} = \log(x + y)$, y(0)=1, find y for x=0.2 taking h=0.1
11. Using modified Euler's method to compute y(0.2), given $\frac{dy}{dx} = x + y$, y(0)=1 by taking h=0.1
12. Solve $\frac{dy}{dx} = xy$; y (1) =2, find approximate solution at $x_1 = 1.2$ using Runge-Kutta method.

13. Using Runge-Kutta method solve $\frac{dy}{dx} = 3x + \frac{y}{2}$ with y (0) =1, compute y (0.2) by taking h=0.2

14. Using Runge-Kutta method find y (0.2) for the equation $\frac{dy}{dx} = \frac{y-x}{y+x}$ with y (0) =1, by taking h=0.2

15. Solve $\frac{dy}{dx} = x + y^2$; y (0) =1 for x=0.2(0.2)0.4 using Runge-Kutta method.

16. Apply Milne's method to find a solution of differential equation $y' = x - y^2$ in the range $0 \leq x \leq 1$ for the boundary condition y=0 at x=0.

17. Using Milne's method find y (4.5) given $5xy' + y^2 - 2 = 0$ given y (4) =1. y(4.1)=1.0049, y(4.2)=1.0097, y(4.3)=1.0143, y(4.4)=1.0187.

18. Given $y' = x(x^2 + y^2)e^{-x}$, $y(0) = 1$, find y at x=0.1, 0.2 and 0.3 by Taylor's series method and compute y(0.4) by Milne's method.

19. Using Runge-Kutta method of order 4, find y for x=0.1, 0.2 and 0.3 given that $\frac{dy}{dx} = xy + y^2$, y (0) =1 continue the solution at x=0.4 using Milne's method.

20. Given $\frac{dy}{dx} = x^3 + y$, y(0)=2, the values of y(0.2)=2.073, y(0.4)=2.452 and y(0.6)=3.023. find y (0.8) by Milne's predictor-corrector method taking h=0.

**********

**SIR M. VISVESVARAYA INSTITUTE OF TECHNOLOGY,BENGALURU-562157**
**DEPARTMENT OF MATHEMATICS**
**COURSE END SURVEY**

**COURSE:B.E** **SEMESTER:2** **SECTION:D** **BRANCH:EEE** **A.Y:2023-24**
**SUB NAME:Mathematics-II for EEE stream** **SUBJECT CODE: :BMATE201**
**NAME OF THE FACULTY:SHUBA R N**

**Course Outcomes(Course skills sets)**

**CO1:** Understand the applications of vector calculus refer to solenoidal, irrotational vectors, lineintegral and surface integral
**CO2:** Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation
**CO3:** To understand the concept of Laplace transform and to solve initial value problems.
**CO4:** Apply the knowledge of numerical methods in solving physical and engineering phenomena
**CO5:** Get familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/PYTHON/ SCILAB

**Students are supposed to rate their experience with the Course Outcomes(CO's) listed above.**
**Use the scale of pointsnas given below:**

| Levels | Excellent | Good | Average |
|---|---|---|---|
| Points | 3 | 2 | 1 |

| Sl No | USN | Student Name | C01 | CO2 | CO3 | CO4 | CO5 | Signature |
|---|---|---|---|---|---|---|---|---|
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| 2 | 1MV23EE002 | ADARSH KUMAR G M | 3 | 2 | 3 | 3 | 3 | |
| 3 | 1MV23EE003 | ADITYA SURYA DEV N P | 3 | 3 | 2 | 2 | 2 | |
| 4 | 1MV23EE004 | AKARSHIKA SRIVASTAVA | 3 | 3 | 3 | 3 | 3 | Akarshika |
| 5 | 1MV23EE005 | AMBIKA SHATAGAR | 2 | 3 | 2 | 2 | 3 | |
| 6 | 1MV23EE006 | ANANYA SINGH | 3 | 3 | 3 | 3 | 3 | |
| 7 | 1MV23EE007 | ANKIT KUMAR | 3 | 3 | 3 | 3 | 3 | |
| 8 | 1MV23EE008 | ARYA M | 2 | 3 | 2 | 3 | 2 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 9 | 1MV23EE009 | ARYA PRASAD S | 3 | 3 | 3 | 3 | 3 | |
| 10 | 1MV23EE010 | ARYAN ANILRAO DESALE | 3 | 2 | 2 | 3 | 2 | ARYAN |
| 11 | 1MV23EE011 | ASTITWA SINGH | 3 | 3 | 3 | 3 | 3 | |
| 12 | 1MV23EE012 | BAIREDDY KALYANI | | | | | | |
| 13 | 1MV23EE013 | BHARAT M HANASI | 3 | 3 | 3 | 3 | 3 | |
| 14 | 1MV23EE014 | BHASKAR SINHA | 3 | 3 | 3 | 3 | 3 | |
| 15 | 1MV23EE015 | CHANDAN J | 3 | 3 | 3 | 3 | 3 | Chandan J |
| 16 | 1MV23EE016 | CHEELAM VARUN REDDY | 2 | 3 | 2 | 3 | 3 | Cheelam |
| 17 | 1MV23EE017 | DEEKSHITHA D G | 3 | 3 | 3 | 3 | 3 | Deepika |
| 18 | 1MV23EE018 | DEEPIKA E | 2 | 2 | 2 | 3 | 3 | Deepika |
| 19 | 1MV23EE019 | DIAMOND TIRTHANKAR RAJ | 3 | 3 | 3 | 3 | 3 | Diamond. |
| 20 | 1MV23EE020 | DILEEP L | 3 | 3 | 3 | 3 | 3 | Dileep.L |
| 21 | 1MV23EE021 | FIZA KOUSAR | 3 | 3 | 3 | 3 | 3 | |
| 22 | 1MV23EE022 | G K SPOORTHI | 3 | 3 | 3 | 3 | 3 | |
| 23 | 1MV23EE023 | GAYATRI | 3 | 3 | 3 | 3 | 3 | Gayatri |
| 24 | 1MV23EE024 | GIRISH T P | 3 | 3 | 3 | 3 | 3 | Girish.T.P |
| 25 | 1MV23EE025 | HEMANTH K D | 2 | 2 | 3 | 3 | 3 | |
| 26 | 1MV23EE026 | JEEVAN | 3 | 2 | 2 | 3 | 3 | |
| 27 | 1MV23EE027 | KEERTHANA B Y | 3 | 2 | 3 | 3 | 3 | |
| 28 | 1MV23EE028 | LAKSHMI | 3 | 3 | 3 | 3 | 3 | |
| 29 | 1MV23EE029 | LAKSHMI H GOWDA | 3 | 2 | 3 | 2 | 2 | |
| 30 | 1MV23EE030 | LAVANYA R | 3 | 3 | 2 | 2 | 3 | |
| 31 | 1MV23EE031 | LIKHITH S R | 3 | 2 | 3 | 2 | 3 | MANYA |
| 32 | 1MV23EE032 | MAANYA S | 3 | 2 | 3 | 2 | 3 | |
| 33 | 1MV23EE033 | MAHAMMAD ANEEF M | 3 | 3 | 3 | 3 | 3 | |
| 34 | 1MV23EE034 | MANOHAR KUMAR | 3 | 3 | 3 | 3 | 3 | Manohar. |
| 35 | 1MV23EE035 | MAYANK KUMAR | 3 | 3 | 2 | 3 | 3 | Mayank |
| 36 | 1MV23EE036 | MUSTAFA BOHRA | 3 | 3 | 3 | 3 | 3 | |
| 37 | 1MV23EE037 | NAINIKA | 3 | 3 | 3 | 3 | 3 | |
| 38 | 1MV23EE038 | NANDINI APAAR | 3 | 3 | 3 | 3 | 3 | Nandini |
| 39 | 1MV23EE039 | NANDINI ARKACHARI | 3 | 2 | 2 | 3 | 3 | NANDINI |
| 40 | 1MV23EE040 | NANDITHA R | 3 | 3 | 3 | 3 | 3 | |
| 41 | 1MV23EE041 | NARSING | 3 | 3 | 3 | 3 | 3 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 42 | 1MV23EE042 | NAVEEN KUMAR | 3 | 3 | 3 | 3 | 3 | |
| 43 | 1MV23EE043 | NAVEEN R | 3 | 3 | 3 | 3 | 3 | |
| 44 | 1MV23EE044 | NIMISHA TRIPATHI | 3 | 3 | 3 | 3 | 2 | |
| 45 | 1MV23EE045 | NIMISHITH GOWDA D P | 3 | 3 | 2 | 3 | 3 | |
| 46 | 1MV23EE046 | NITESH KUMAR SAH | 2 | 3 | 2 | 2 | 3 | |
| 47 | 1MV23EE047 | NITISH KUMAR | 3 | 3 | 3 | 3 | 3 | |
| 48 | 1MV23EE048 | OMKAR | 3 | 3 | 3 | 3 | 3 | |
| 49 | 1MV23EE049 | PATEL ADITI HIRALAL | 3 | 3 | 3 | 2 | 3 | |
| 50 | 1MV23EE050 | PIYUSH RATN | 3 | 3 | 3 | 3 | 3 | |
| 51 | 1MV23EE051 | POOJA P | 3 | 3 | 3 | 3 | 3 | |
| 52 | 1MV23EE052 | POOJA S N | 3 | 3 | 2 | 3 | 2 | |
| 53 | 1MV23EE053 | PRAJWAL APPASAHEB SHINDHE | 3 | 3 | 3 | 3 | 3 | |
| 54 | 1MV23EE054 | PRANAV BHARDWAJ | 3 | 3 | 3 | 3 | 3 | |
| 55 | 1MV23EE055 | PRATHAM SHARMA | 3 | 3 | 3 | 3 | 1 | |
| 56 | 1MV23EE056 | PRAVAAL RAJ MISHRA | 3 | 3 | 3 | 3 | 3 | |
| 57 | 1MV23EE057 | PREKSHA MUNDRA | 3 | 3 | 3 | 3 | 3 | |

Student Feedback on Performance of Faculty || BE || Sem - 2 || 2023 - 24 | 2023-24 | SMVIT

**Faculty** : Mrs. SHUBA.R.N

**Subject** : BMATE201 - Mathematics-II for Electrical & Electronics Engineering Stream

**Program** :

**Semester** : 2

**Filled By** : 57

**Division** : 2D - EE

| Sr. No. | Question | Weight | Score Obtained | % | No. of students who have said | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Excellent(5) | Very Good (4) | Good(3) | Fair(2) | Bad(1) |
| 1 | Planning of lectures and Presentation of subject matter in logical sequence | 3 | 648 | 75.79 | 26 | 8 | 13 | 5 | 5 |
| 2 | Presentation and Communication skills | 3 | 639 | 74.74 | 24 | 9 | 14 | 5 | 5 |
| 3 | Subject knowledge | 3 | 660 | 77.19 | 26 | 7 | 17 | 4 | 3 |
| 4 | Willingness to clarify doubts and provide guidance | 3 | 630 | 73.68 | 21 | 13 | 13 | 4 | 6 |
| 5 | Class Room Management | 3 | 648 | 75.79 | 24 | 11 | 12 | 6 | 4 |
| 6 | Use of Black board and other teaching aids | 3 | 660 | 77.19 | 27 | 7 | 14 | 6 | 3 |
| 7 | Preparedness for class | 2 | 438 | 76.84 | 25 | 10 | 14 | 4 | 4 |
| 8 | Fostering punctuality through his / her example | 2 | 430 | 75.44 | 25 | 7 | 15 | 7 | 3 |
| 9 | Confidence level of the teacher | 2 | 438 | 76.84 | 25 | 9 | 15 | 5 | 3 |
| 10 | Attire and mannerism | 2 | 418 | 73.33 | 22 | 11 | 13 | 5 | 6 |
| 11 | Overall assessment of the teacher | 3 | 654 | 76.49 | 24 | 11 | 14 | 4 | 4 |
| | | | | | Most of the times(5) | Rarely(3) | Never(1) | | |
| 12 | Relates theory to applications of real world problems | 1 | 235 | 82.46 | 39 | 11 | 7 | | |
| | | | | | Always(5) | Most of the time(3) | Rarely(1) | | |
| 13 | Teaching in a way resulting in real learning / understanding and motivation | 2 | 402 | 70.53 | 26 | 20 | 11 | | |
| | | | | | Impartial(5) | Justifiable(3) | Partial(1) | | |
| 14 | Fairness in evaluation | 1 | 209 | 73.33 | 25 | 26 | 6 | | |
| | | | | | Acceptable (5) | Slow(3) | Fast(1) | | |
| 15 | Pace at which the subject is taught | 2 | 478 | 83.86 | 44 | 3 | 10 | | |

**Overall Score**

| Max. Possible points | Obtained | Percentage |
|---|---|---|
| 9975 | 7587 | 76.06% |



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**Faculty** : Mrs. SHUBA.R.N

**Program** :

**Filled By** : 27

**Subject** : BMATS201 - Mathematics - II for Computer Science and Engineering Stream

**Semester** : 2

**Division** : 2I - CS

| Sr. No. | Question | Weight | Score Obtained | % | No. of students who have said | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Excellent(5) | Very Good (4) | Good(3) | Fair(2) | Bad(1) |
| 1 | Planning of lectures and Presentation of subject matter in logical sequence | 3 | 348 | 85.93 | 15 | 5 | 7 | 0 | 0 |
| 2 | Presentation and Communication skills | 3 | 342 | 84.44 | 14 | 6 | 6 | 1 | 0 |
| 3 | Subject knowledge | 3 | 345 | 85.19 | 14 | 6 | 7 | 0 | 0 |
| 4 | Willingness to clarify doubts and provide guidance | 3 | 348 | 85.93 | 14 | 7 | 6 | 0 | 0 |
| 5 | Class Room Management | 3 | 339 | 83.70 | 14 | 5 | 7 | 1 | 0 |
| 6 | Use of Black board and other teaching aids | 3 | 348 | 85.93 | 14 | 7 | 6 | 0 | 0 |
| 7 | Preparedness for class | 2 | 236 | 87.41 | 16 | 5 | 6 | 0 | 0 |
| 8 | Fostering punctuality through his / her example | 2 | 232 | 85.93 | 14 | 7 | 6 | 0 | 0 |
| 9 | Confidence level of the teacher | 2 | 230 | 85.19 | 15 | 4 | 8 | 0 | 0 |
| 10 | Attire and mannerism | 2 | 230 | 85.19 | 14 | 7 | 5 | 1 | 0 |
| 11 | Overall assessment of the teacher | 3 | 354 | 87.41 | 16 | 5 | 6 | 0 | 0 |
| | | | | | Most of the times(5) | Rarely(3) | Never(1) | | |
| 12 | Relates theory to applications of real world problems | 1 | 117 | 86.67 | 18 | 9 | 0 | | |
| | | | | | Always(5) | Most of the time(3) | Rarely(1) | | |
| 13 | Teaching in a way resulting in real learning / understanding and motivation | 2 | 222 | 82.22 | 17 | 8 | 2 | | |
| | | | | | Impartial(5) | Justifiable(3) | Partial(1) | | |
| 14 | Fairness in evaluation | 1 | 111 | 82.22 | 15 | 12 | 0 | | |
| | | | | | Acceptable (5) | Slow(3) | Fast(1) | | |
| 15 | Pace at which the subject is taught | 2 | 242 | 89.63 | 20 | 7 | 0 | | |

| Overall Score | | |
|---|---|---|
| Max. Possible points | Obtained | Percentage |
| 4725 | 4044 | 85.59% |

Printed on : 09-07-2024 11:08 AM

Faculty : Mrs. SHUBA.R.N

Program :

Filled By : 19

Subject : BMATS201 - Mathematics - II for Computer Science and Engineering Stream

Semester : 2

Division : 2K - CS

| Sr. No. | Question | Weight | Score Obtained | % | No. of students who have said | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Excellent(5) | Very Good (4) | Good(3) | Fair(2) | Bad(1) |
| 1 | Planning of lectures and Presentation of subject matter in logical sequence | 3 | 210 | 73.68 | 5 | 6 | 5 | 3 | 0 |
| 2 | Presentation and Communication skills | 3 | 207 | 72.63 | 4 | 7 | 5 | 3 | 0 |
| 3 | Subject knowledge | 3 | 207 | 72.63 | 4 | 6 | 7 | 2 | 0 |
| 4 | Willingness to clarify doubts and provide guidance | 3 | 210 | 73.68 | 5 | 5 | 7 | 2 | 0 |
| 5 | Class Room Management | 3 | 204 | 71.58 | 4 | 7 | 4 | 4 | 0 |
| 6 | Use of Black board and other teaching aids | 3 | 207 | 72.63 | 5 | 6 | 4 | 4 | 0 |
| 7 | Preparedness for class | 2 | 140 | 73.68 | 6 | 5 | 4 | 4 | 0 |
| 8 | Fostering punctuality through his / her example | 2 | 138 | 72.63 | 4 | 8 | 3 | 4 | 0 |
| 9 | Confidence level of the teacher | 2 | 142 | 74.74 | 5 | 6 | 6 | 2 | 0 |
| 10 | Attire and mannerism | 2 | 142 | 74.74 | 5 | 6 | 6 | 2 | 0 |
| 11 | Overall assessment of the teacher | 3 | 225 | 78.95 | 6 | 7 | 5 | 1 | 0 |
| | | | | | Most of the times(5) | Rarely(3) | Never(1) | | |
| 12 | Relates theory to applications of real world problems | 1 | 83 | 87.37 | 13 | 6 | 0 | | |
| | | | | | Always(5) | Most of the time(3) | Rarely(1) | | |
| 13 | Teaching in a way resulting in real learning / understanding and motivation | 2 | 122 | 64.21 | 5 | 11 | 3 | | |
| | | | | | Impartial(5) | Justifiable(3) | Partial(1) | | |
| 14 | Fairness in evaluation | 1 | 73 | 76.84 | 9 | 9 | 1 | | |
| | | | | | Acceptable (5) | Slow(3) | Fast(1) | | |
| 15 | Pace at which the subject is taught | 2 | 174 | 91.58 | 16 | 2 | 1 | | |

| Overall Score | | |
|---|---|---|
| Max. Possible points | Obtained | Percentage |
| 3325 | 2484 | 74.71% |

**Course Code/Course Title: BMATE201/Mathematics-II for EEE Stream** **Sem./Section/Branch: II/D/EEE**

**4 CREDITS (Integrated Course)**

| Roll No | USN | Name | TESTS | | | ASSIGNMENTS | | | PRACTICAL | | Total | Signature of the student |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | T1 | T2 | | A1 | A2 | | theory (25) | Practicals | | |
| | | | 15 | 15 | | 10 | 10 | | 25 | 25 | 50 | |
| 1 | 1MV23EE001 | ACHAL CHOURASIYA | 0 | 14 | 12 | 10 | 10 | 10 | 22 | 20 | 42 | |
| 2 | 1MV23EE002 | ADARSH KUMAR G M | 5 | 7 | 6 | 10 | 10 | 10 | 16 | 23 | 39 | |
| 3 | 1MV23EE003 | ADITYA SURYA DEV N P | 12 | 14 | 13 | 10 | 10 | 10 | 23 | 21 | 44 | |
| 4 | 1MV23EE004 | AKARSHIKA SRIVASTAVA | AB | 10 | 5 | 10 | 10 | 10 | 15 | 14 | 29 | Akarshika |
| 5 | 1MV23EE005 | AMBIKA SHATAGAR | 10 | 14 | 12 | 10 | 10 | 10 | 22 | 24 | 46 | |
| 6 | 1MV23EE006 | ANANYA SINGH | 11 | 13 | 12 | 10 | 10 | 10 | 22 | 22 | 44 | |
| 7 | 1MV23EE007 | ANKIT KUMAR | 8 | 8 | 8 | 10 | 10 | 10 | 18 | 20 | 38 | |
| 8 | 1MV23EE008 | ARYA M | 3 | AB | 2 | 8 | 8 | 8 | 10 | 1 | 11 | |
| 9 | 1MV23EE009 | ARYA PRASAD S | 2 | 4 | 3 | 8 | 8 | 8 | 11 | 13 | 24 | |
| 10 | 1MV23EE010 | ARYAN ANILRAO DESALE | 4 | 9 | 7 | 10 | 10 | 10 | 17 | 10 | 27 | |
| 11 | 1MV23EE011 | ASTITWA SINGH | 14 | 10 | 12 | 10 | 10 | 10 | 22 | 18 | 40 | |
| 12 | 1MV23EE012 | BAIREDDY KALYANI | 13 | 15 | 14 | 10 | 10 | 10 | 24 | 24 | 48 | Kalyani |
| 13 | 1MV23EE013 | BHARAT M HANASI | 13 | 14 | 14 | 10 | 10 | 10 | 24 | 23 | 47 | |
| 14 | 1MV23EE014 | BHASKAR SINHA | 13 | 12 | 13 | 10 | 10 | 10 | 23 | 15 | 38 | |
| 15 | 1MV23EE015 | CHANDAN J | 11 | 14 | 13 | 10 | 10 | 10 | 23 | 19 | 42 | Chandan J |
| 16 | 1MV23EE016 | CHEELAM VARUN REDDY | 5 | 11 | 8 | 10 | 10 | 10 | 18 | 20 | 38 | |
| 17 | 1MV23EE017 | DEEKSHITHA D G | 11 | 11 | 11 | 10 | 10 | 10 | 21 | 24 | 45 | |
| 18 | 1MV23EE018 | DEEPIKA E | 15 | 15 | 15 | 10 | 10 | 10 | 25 | 21 | 46 | Deepika.E |
| 19 | 1MV23EE019 | DIAMOND TIRTHANKAR RA | 6 | 8 | 7 | 10 | 10 | 10 | 17 | 16 | 33 | Diamond |
| 20 | 1MV23EE020 | DILEEP L | 0 | 9 | 5 | 10 | 10 | 10 | 15 | 20 | 35 | Dileep.L |
| 21 | 1MV23EE021 | FIZA KOUSAR | 12 | 15 | 14 | 10 | 10 | 10 | 24 | 21 | 45 | |
| 22 | 1MV23EE022 | G K SPOORTHI | 1 | 2 | 2 | 10 | 10 | 10 | 12 | 23 | 35 | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | 1MV23EE023 | GAYATRI | 15 | 15 | 15 | 10 | 10 | 10 | 25 | 24 | 49 | Gayatri |
| 24 | 1MV23EE024 | GIRISH T P | 3 | 8 | 6 | 10 | 10 | 10 | 16 | 22 | 38 | Girish T.P |
| 25 | 1MV23EE025 | HEMANTH K D | 0 | 10 | 5 | 10 | 10 | 10 | 15 | 11 | 26 | |
| 26 | 1MV23EE026 | JEEVAN | 2 | 10 | 6 | 10 | 10 | 10 | 16 | 20 | 36 | |
| 27 | 1MV23EE027 | KEERTHANA B Y | 11 | 15 | 13 | 10 | 10 | 10 | 23 | 23 | 46 | |
| 28 | 1MV23EE028 | LAKSHMI | 11 | 11 | 11 | 10 | 10 | 10 | 21 | 20 | 41 | Lakshmi |
| 29 | 1MV23EE029 | LAKSHMI H GOWDA | 13 | 14 | 14 | 10 | 10 | 10 | 24 | 23 | 47 | Lakshmi. |
| 30 | 1MV23EE030 | LAVANYA R | 2 | 10 | 6 | 10 | 10 | 10 | 16 | 21 | 37 | |
| 31 | 1MV23EE031 | LIKHITH S R | 4 | 11 | 8 | 10 | 10 | 10 | 18 | 24 | 42 | Likhith |
| 32 | 1MV23EE032 | MAANYA S | 15 | 15 | 15 | 10 | 10 | 10 | 25 | 24 | 49 | Maanya S |
| 33 | 1MV23EE033 | MAHAMMAD ANEEF M | 2 | 7 | 5 | 10 | 10 | 10 | 15 | 21 | 36 | Aneef M |
| 34 | 1MV23EE034 | MANOHAR KUMAR | 11 | 14 | 13 | 10 | 10 | 10 | 23 | 21 | 44 | Manohar. |
| 35 | 1MV23EE035 | MAYANK KUMAR | 4 | 10 | 7 | 10 | 10 | 10 | 17 | 18 | 36 | Mayank |
| 36 | 1MV23EE036 | MUSTAFA BOHRA | 14 | 15 | 15 | 10 | 10 | 10 | 25 | 22 | 47 | |
| 37 | 1MV23EE037 | NAINIKA | 12 | 10 | 11 | 10 | 10 | 10 | 21 | 24 | 45 | Nainika |
| 38 | 1MV23EE038 | NANDINI APAAR | 11 | 15 | 13 | 10 | 10 | 10 | 23 | 24 | 47 | Nandini |
| 39 | 1MV23EE039 | NANDINI ARKACHARI | 13 | 14 | 14 | 10 | 10 | 10 | 24 | 23 | 47 | Nandini. |
| 40 | 1MV23EE040 | NANDITHA R | 7 | 8 | 8 | 10 | 10 | 10 | 18 | 22 | 40 | Nanditha |
| 41 | 1MV23EE041 | NARSING | 4 | 10 | 7 | 10 | 10 | 10 | 17 | 18 | 35 | |
| 42 | 1MV23EE042 | NAVEEN KUMAR | 4 | 8 | 6 | 10 | 10 | 10 | 16 | 21 | 37 | Naveen |
| 43 | 1MV23EE043 | NAVEEN R | 4 | 14 | 9 | 10 | 10 | 10 | 19 | 22 | 41 | Naveen R |
| 44 | 1MV23EE044 | NIMISHA TRIPATHI | 6 | 13 | 10 | 10 | 10 | 10 | 20 | 24 | 44 | |
| 45 | 1MV23EE045 | NIMISHITH GOWDA D P | 4 | 15 | 10 | 10 | 10 | 10 | 20 | 15 | 35 | Nim |
| 46 | 1MV23EE046 | NITESH KUMAR SAH | 13 | 15 | 14 | 10 | 10 | 10 | 24 | 21 | 45 | Nitesh |
| 47 | 1MV23EE047 | NITISH KUMAR | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 10 | 11 | Nitish |
| 48 | 1MV23EE048 | OMKAR | 11 | 11 | 11 | 10 | 10 | 10 | 21 | 19 | 40 | |
| 49 | 1MV23EE049 | PATEL ADITI HIRALAL | 10 | 5 | 8 | 10 | 10 | 10 | 18 | 24 | 42 | Patel. |
| 50 | 1MV23EE050 | PIYUSH RATN | 13 | 15 | 14 | 10 | 10 | 10 | 24 | 23 | 47 | Piyush |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 51 | 1MV23EE051 | POOJA P | 14 | 7 | 11 | 10 | 10 | 10 | 21 | 24 | 45 | |
| 52 | 1MV23EE052 | POOJA S N | 8 | 11 | 10 | 10 | 10 | 10 | 20 | 21 | 41 | |
| 53 | 1MV23EE053 | PRAJWAL APPASAHEB SHINDHE | 8 | 14 | 11 | 10 | 10 | 10 | 21 | 23 | 44 | |
| 54 | 1MV23EE054 | PRANAV BHARDWAJ | 4 | 8 | 6 | 10 | 10 | 10 | 16 | 21 | 37 | |
| 55 | 1MV23EE055 | PRATHAM SHARMA | 5 | 14 | 10 | 10 | 10 | 10 | 20 | 22 | 42 | |
| 56 | 1MV23EE056 | PRAVAAL RAJ MISHRA | 5 | 8 | 7 | 10 | 10 | 10 | 17 | 21 | 38 | |
| 57 | 1MV23EE057 | PREKSHA MUNDRA | 12 | 13 | 13 | 10 | 10 | 10 | 23 | 24 | 47 | |
| | | Signature of Staff | | | | | | Signature of HoD | | | | |

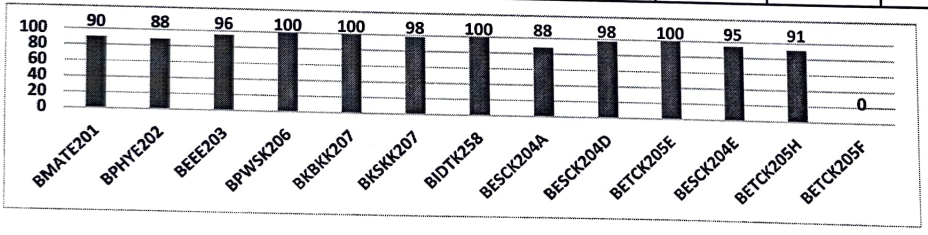
SIR M. VISVESVARAYA INSTITUTE OF TECHNOLOGY

RESULTS OF VTU JUNE-JULY 2024 EXAMINATION (22 SCHEME NEP)

COURSE: BE BRANCH: ELECTRONICS & ELECTRICAL ENGG. SEM: SECOND ACADEMIC YEAR: 2023-24

## Subject Wise Pass Percentage

| Sub Code | Subject Name | No of Students | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Allotted | Appeared | Passed | Failed | Absent | Result Withheld | Not Eligible | Pass % age |
| BMATE201 | MATHEMATICS-II FOR EES | 114 | 112 | 101 | 11 | 0 | 0 | 2 | 90 |
| BPHYE202 | APPLIED PHYSICS FOR EES | 114 | 103 | 91 | 12 | 0 | 0 | 11 | 88 |
| BEEE203 | ELEMENT OF ELECTRICAL ENGINEERING | 114 | 114 | 109 | 5 | 0 | 0 | 0 | 96 |
| BPWSK206 | PROFESSIONAL WRITING SKILLS IN ENGLISH | 114 | 114 | 114 | 0 | 0 | 0 | 0 | 100 |
| BKBKK207 | BALAKE KANNADA | 114 | 53 | 53 | 0 | 0 | 0 | 0 | 100 |
| BKSKK207 | SAMSKRUTIKA KANNADA | 114 | 61 | 60 | 1 | 0 | 0 | 0 | 98 |
| BIDTK258 | INNOVATION AND DESIGN THINKING | 114 | 114 | 114 | 0 | 0 | 0 | 0 | 100 |
| BESCK204A | INTRODUCTION TO CIVIL ENGINEERING | 114 | 34 | 30 | 4 | 0 | 0 | 0 | 88 |
| BESCK204D | INTRODUCTION TO MECHANICAL ENGINEERING | 114 | 42 | 41 | 1 | 0 | 0 | 0 | 98 |
| BETCK205E | RENEWABLE ENERGY SOURCES | 114 | 73 | 73 | 0 | 0 | 0 | 0 | 100 |
| BESCK204E | INTRODUCTION TO C PROGRAMMING | 114 | 38 | 36 | 2 | 0 | 0 | 0 | 95 |
| BETCK205H | INTRODUCTION TO INTERNET OF THINGS (IOT) | 114 | 35 | 32 | 3 | 0 | 0 | 1 | 91 |
| BETCK205F | WASTE MANAGEMENT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | #DIV/0! |




| Overall Pass Percentage % | | |
|---|---|---|
| 90 / 114 | = | 78.95 |

| Number of students secured | |
|---|---|
| FCD | 62 |
| FC | 19 |
| SC | 6 |