ವಿಶ್ವೇಶ್ವರಯ್ಯತಾಂತ್ರಿಕವಿಶ್ವವಿದ್ಯಾಲಯ

ವಿಟಿಯುಅಧಿನಿಯಮ೧೯೯೪ ರಅಡಿಯಲ್ಲಿಕರ್ನಾಟಕಸರ್ಕಾರದಿಂದಸ್ಥಾಪಿತವಾದರಾಜ್ಯವಿಶ್ವವಿದ್ಯಾಲಯ

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

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

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REGISTRAR

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REF: VTU/BGM/Aca/BoS/2023/ 613

DATE: 2 MAY 2023

CIRCULAR

Subject: Common Mathematics Syllabus for all PG programs under Electrical Engineering Sciences BoS Regarding...

Reference: Chairperson email dated 03.03.2023

Based on the frequent quarries from the stakeholders' following clarifications are given to all the concerned;

> **"Advanced Engineering Mathematics 22MATEE11** course is common to all the post-graduate programs under the **Electrical Engineering Sciences Board of Studies"**

The syllabus of Advanced Engineering Mathematics (22MATEE11) is made available for all the stakeholders @**https://vtu.ac.in/pdf/cbcs/pg/2022/CMEESSCH.pdf**,

Also, the hard copy of the syllabus is attached to this circular for ready reference to all concerned.

The principals of all engineering colleges under the ambit of the university are hereby informed to bring the content of the circular to the notice of all concerned

Sd/-
REGISTRAR

Enel: As mentioned above

To,

The principals of engineering colleges under the ambit of the university

Copy to:

1. The Hon'ble Vice Chancellors through Secretary to VC, VTU, Belagavi for kind information.
2. The Registrar (Evaluation) for needful
3. The QPDS Examination Section VTU, Belagavi for information and needful.
4. The Director (I/c) ITI SMU VTU Belagavi for information and make arrangements to upload on VTU web portal
5. Office Copy

02/05/23

REGISTRAR

Common Syllabus for M.Tech., in EES stream
ChoiceBasedCreditSystem(CBCS)and OutcomeBasedEducation(OBE)
SEMESTER-I

ADVANCED ENGINEERING MATHEMATICS

Course Code	22MATEE11	CIEMarks	50
TeachingHours/Week (L:T:P)	3:0:0	SEEMarks	50
Credits	03	ExamHours	03

Course Learning objectives:

- To have an insight into solving Linear Algebraic Equations and the importance of Eigen values and Eigen vectors in singular value decompositions.
- To develop proficiency in vector spaces and linear transformations
- To enable learning concepts of probability theory and their implication in Electrical and Electrical Engineering.

Module-1: Linear Algebra

Solution of Systems of Linear Equations: Direct methods-Partition method,Croute's Triangularisation method.Iterative method- relaxation method.Eigen values and Eigen vectors. Bounds on Eigen Values. Jacobi method & Givens method for symmetric matrices.

RBT Level: L1, L2, L3 **8 Hours**

Module-2: Vector Space 1

Introductiontovectorspacesandsub-spaces,definitions, Null spaces, column spacesillustrativeexample.Linearlyindependentanddependentvectors-Basis-definitionandproblems.Lineartransformations-definitions.MatrixformoflinearTransformations-Illustrativeexamples.

RBT Level: L1, L2, L3 **8 Hours**

Module-3:Vector Space 2

Orthogonal vectorsand orthogonal bases. Gram-SchmidtOrthogonalizationprocess.QR decomposition, Least square problems, Singular value decomposition. Applications.

Module-4:Probability distribution functions

Reviewofbasicprobabilitytheory. Random variables, Probability distributions: Binomial, Poisson, uniform, and Normal (Gaussian) and Erlangdistributions. Joint probability distribution (discrete and continuous)-Illustrative examples. Independent random variables, covariance and correlation.

RBT Level: L1, L2, L3 **8 Hours**

Module-5:Moments &Transformation of random variables

Moments,Central moments, Transformation of random variables Characteristic functions, probability generating and moment generating functions-illustrations. Engineering applications: Entropy and Source coding.

RBT Level: L1, L2, L3 **8 Hours**

Courseoutcomes:

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

1. Solve system of linear equations using direct and iterative methods.
2. Understand the fundamentals of vector space and bases in reference to transformations.
3. Use the idea of Eigen values and Eigen vectors for the application of Singular value decomposition.
4. Describe the basic notions of discrete and continuous probability distributions.
5. Find out responses of linear systems using statistical and probability tools.

Questionpaperpattern:

TheSEEquestionpaperwillbesetfor100marksandthemarksscoredwillbeproportionatelyreducedto 50.

- Thequestionpaper will havetenfullquestionscarryingequalmarks.
- Eachfullquestionisfor20marks.
- Therewillbetwofullquestions(withamaximumofthreesubquestions)fromeachmodule.
- Eachfullquestionwillhavesubquestioncoveringallthetopicsundera module.
- Thestudentswillhavetoanswer five fullquestions,selectingonefullquestionfromeach module.

Textbooks

1	Linear Algebra and its Applications, David C.Lay et al, Pearson, 5th Edition, 2015.
2	Numerical Methods for Scientific and Engineering Computation, M. K. Jain et al, New Age International, 9th Edition, 2014.
3	Probability and Random Processes, Scott L. Miller, Donald G.Childers. Elsevier 2004

Reference Books

1	Numerical methods for Engineers, Steven C Chapra andRaymond P Canale, McGraw-Hill,7th Edition, 2015.
2	Higher Engineering Mathematics, B.S. Grewal, Khanna Publishers, 44th Edition, 2017.
3	AdvancedEngineeringMathematics, E.Kreyszig, Wiley, 10thedition, 2015

Web links and Video Contacts:

1. http://nptel.ac.in/courses.php?disciplineId=111
2. http://www.class-central.com/subject/math(MOOCs)
3. http://ocw.mit.edu/courses/mathematics/