



(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

S.P.G.Chidambara Nadar - C.Nagammal Campus

S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

### DEPARTMENT OF MATHEMATICS

### MINUTES OF THE THIRD BOARD OF STUDIES MEETING

**DATE:** 20<sup>th</sup> November, 2021, Saturday

**Time:** 11.00am –12.30pm

**PLATFORM:** MS TEAMS




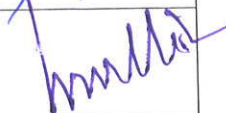

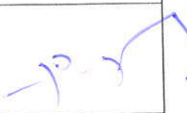


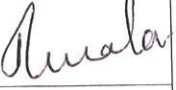
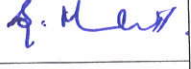

**Meeting Link:** <https://tinyurl.com/III-BoSmeeting>

#### IN ATTENDANCE:

S.No	Name of the Expert	Designation	Capacity
1	Dr. A. Bhaskaran	Professor and Head Department of Applied Physics, Head - Campus Safety and Security, Sri Venkateswara College of Engineering, Sriperumbudur - 602117	Overall Coordinator of First year Board
2	Dr.B. Thilaka	Professor, Department of Applied Mathematics Sri Venkateswara College of Engineering, Sriperumbudur- 602117	Anna University Nominee
3	Dr.R. Asokan	Professor, Department of Mathematics, Madurai Kamaraj University, Madurai	Academic Council nominated BoS Members
4	Dr.V. Lakshmana Gomathi Nayagam	Associate Professor, Department of Mathematics, National Institute of Technology, Thiruchirapalli-15	

S.No	Name of the Expert	Designation	Capacity
1	Dr. S. Kalyani	Controller of Examination, Kamaraj College of Engineering and Technology (Autonomous), Virudhunagar.	Special Invitee
2	Dr. R. Suresh Babu	Dean Academics, Kamaraj College of Engineering and Technology (Autonomous), Virudhunagar.	Special Invitee
3	Dr.D. Princewinston	HoD/Department of Electrical and Electronics Engineering, Kamaraj College of Engineering and Technology (Autonomous), Virudhunagar.	Special Invitee
4	Mr.B.K. Parrthipan	Assistant Professor, Department of Mechanical Engineering, Kamaraj College of Engineering and Technology (Autonomous), Virudhunagar.	Special Invitee
5	Dr.N. Pratheeba	HoD/English, Kamaraj College of Engineering and Technology (Autonomous), Virudhunagar.	Special Invitee
6	Dr.A. Yelilarasi	HoD/Physics, Kamaraj College of Engineering and Technology (Autonomous), Virudhunagar.	Special Invitee
7	Dr.T. Dhanalakshmi	HoD/Chemistry, Kamaraj College of Engineering and Technology (Autonomous), Virudhunagar.	Special Invitee

FACULTY OF MATHEMATICS		INTERNAL MEMBERS
S.No	Name of the Faculty	Designation
1	Dr. K. Thanalakshmi	HoD/Maths <i>K. Thanalakshmi</i>
2	Dr. N. Kamatchi	Associate Professor/Maths <i>N. Kamatchi</i>
3	Dr.A. Maheswari	Associate Professor/Maths <i>A. Maheswari</i>

4	Dr. A. Thamilsai	Assistant Professor / Maths	
5	Dr. N. Mehala	Assistant Professor / Maths	
6	Dr. S. Brindha	Assistant Professor / Maths	
7	Mr. K.M. Sathiskumar	Assistant Professor / Maths	
8	Mrs. M. Geetha	Assistant Professor / Maths	
9	Mr. P. Pandiaraj	Assistant Professor / Maths	
10	Mrs. C.Revathy	Assistant Professor / Maths	
11	Mrs.K.Ananthi	Assistant Professor / Maths	
12	Mrs.P. Mala	Assistant Professor / Maths	
13	Mrs. S. Meenakshi	Assistant Professor / Maths	
14	Mr. S. Gopinath	Assistant Professor / Maths	

**THE MINUTES:**

The third Board of Studies of the Department of Mathematics was conducted on 20.11.2021 online from 11.00 am – 12.30 pm. Dr. K. Thanalakshmi, Head/Department of Mathematics, welcomed all the External BoS members, Special Invitees and Faculty members of Mathematics department to the 3<sup>rd</sup> BoS meeting.

## **DISCUSSIONS:**

1. Dr. K. Thanalakshmi, Head/Department of Mathematics, enlightened the Second Board of Studies meeting minutes and pointed out the actions taken. The Board members noticed the changes made as per their suggestions. Subsequently, the same was approved.
2. Mrs, M. Geetha, AP/Maths, presented the results of previous academic year 2020-2021 of first year (I and II semester) examinations.
3. Dr. K.Thanalakshmi described the new first year curriculum for R2021. Design thinking based new curriculum have been framed to meet the industrial requirements. There are six theory papers and three laboratory courses have been planned for both the semesters. The total credit for first semester is 22 and second semester is 24.
  - i. All the Bos members have appreciated the curriculum and approved.
  - ii. A query was raised, by Dr.V. Lakshmana Gomathi Nayagam, as to why one point was credited for conducting 3-hour class for laboratory when 1 point is being credited for two hours.
  - iii. Dr.A. Bhaskaran opined that 1.5 credit may be provided for physics laboratory and for chemistry laboratory.
  - iv. BoS members instructed us to follow the regulations for providing credits.
4. Dr.A. Thamilisai presented the proposed I semester mathematics syllabus of Matrices and differential calculus.
5. When the syllabus for Matrices and differential calculus was presented,
  - i. Dr.V. Lakshmana Gomathi Nayagam pointed out that the first course outcome “Represent group of equations as Matrix equations, solve simultaneous equations” is not correlated with first unit syllabus. So, he suggested to include the topic “Solution of simultaneous linear equations” in Unit-I.
  - ii. Dr. S. Kalyani pointed out in CO4, the action verb understand is not in the list of Bloom taxonomy action verbs.
  - iii. BoS members suggested that instead of the action verb understand to replace the action verb as ‘Apply’ and also to change the knowledge level as K3.
  - iv. The new CO4 as “Apply the concepts of Differential Calculus for solving engineering problems”.
  - v. All BoS members have appreciated and approved the syllabus.


6. Dr. N. Kamatchi presented the proposed Mathematics Laboratory syllabus for first semester.
7. When the syllabus for Mathematics Laboratory was presented,
  - i. Dr.A. Bhaskaran opined that the idea of introducing MATLAB in first year is appreciated.
  - ii. Also, the BoS members have appreciated the handling of the Mathematics Laboratory with the help of Engineering department faculty members. It is evident that students know the importance of mathematics and studied eagerly.
  - iii. All the Board of Studies members have appreciated the way for framing the mathematics laboratory syllabus.
8. Er. B. K. Parrthiban presented the Principles of Engineering syllabus for first semester.
9. When the syllabus for Principles of Engineering was presented,
  - i. Dr. B. Thilaka suggested to change the action verb "Understand" in CO4 and CO5 of the proposed syllabus for Principles of Engineering.
  - ii. Dr.V. Lakshmana Gomathi Nayagam pointed out that the content "solution of simultaneous linear equation" is already available in the first unit of Matrices and Differential Calculus. Instead of solution of simultaneous linear equation, applications of system of linear equations may be included.
  - iii. BoS members have very much appreciated and approved the syllabus.
10. Dr. R.Asokan accepted all the points discussed and the Board of studies members have approved the syllabus.
11. Dr. K. Thanalaksmi, HOD/Maths informed that the BoS approved syllabus will be presented in the academic council meeting for the implementation.
12. Dr. T. Dhanalakshmi, HOD/Chemistry proposed the vote of thanks to all the external and internal expert members.

**List of Enclosures:**

First Year Curriculum  
Syllabus

- i. Matrices and differential calculus
- ii. Mathematics Laboratory
- iii. Principles of Engineering

Approved  
G. M. 22/11/2021  
HOD Maths

  
(BOS-Coordinator)  
(Dr. A. Thamilasari,  
Ap/Maths)

## FIRST YEAR COURSES

(Regulations 2021 – Autonomous)

### SEMESTER I

Sl.No	Course Code	Course Name	Credits			
			L	T	P	C
<b>Theory</b>						
1	SH101	Technical English	3	0	0	3
2	MA101	Matrices and Differential Calculus	3	1	0	4
3	PH101	Engineering Physics	3	0	0	3
4	GE101	Principles of Engineering	3	0	0	3
5	EM101	Coding Techniques - I	3	0	0	3
6	GE102	Biology for Engineers	3	0	0	3
<b>Practicals</b>						
7	MA102	Mathematics Laboratory	0	0	3	1
8	PH102	Physics Laboratory	0	0	3	1
9	EM102	Coding Techniques - I Laboratory	0	0	3	1
Total Credits			18	1	9	22

## SEMESTER II

Sl.No.	Course Code	Course Name	Credits			
			L	T	P	C
<b>Theory</b>						
1	SH151	Technical Communication Skills Development	3	0	2	4
2	MA151	Vector Calculus and Laplace Transforms	3	0	0	3
3	CY151	Engineering Chemistry	3	0	0	3
4	GE151	Design Thinking	3	0	0	3
5	EM151	Coding Techniques - II	3	0	0	3
6	GE152	Engineering Graphics	3	0	2	4
<b>Practicals</b>						
7	GE153	MATLAB & LabVIEW Simulation Laboratory	0	0	4	2
8	CY152	Chemistry Laboratory	0	0	3	1
9	EM152	Coding Techniques – II Laboratory	0	0	3	1
Total Credits			18	0	14	24

Course Code	Course Name	L	T	P	C
MA101	Matrices and Differential Calculus	3	1	0	4

**Category:** Foundation Courses (Basic Science Courses)

**a. Preamble**

This course introduces basic concepts and techniques of multivariable calculus, matrices, sequences and series and ordinary differential equations and highlights their applications in various field of engineering such as Design Engineering, Electric Circuit Theory, Graph Theory, Cryptography etc.

**b. Course Outcomes**

After successful completion of the course, the students will be able to

CO. No.	Course Outcome	Knowledge Level
CO1	Represent the system of equations as matrices, Solve simultaneous equations, Derive Eigen Values and Eigen Vectors.	K3
CO2	Analyze and test the convergence of Infinite Series.	K3
CO3	Compute the partial and total derivatives, Jacobian and Optimality of functions of several variables.	K3
CO4	Apply the concepts of Differential Calculus for solving engineering problems.	K3
CO5	Solve linear differential equations using different methods.	K3



MATRICES	12
Solution of simultaneous linear equations – Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values – Problem solving using Cayley-Hamilton theorem – Similarity transformation – Orthogonal transformation of a symmetric matrix to diagonal form – Quadratic form – Orthogonal reduction to its canonical form.	
INFINITE SERIES	12
Sequences – Convergence of series – Divergence - General properties – Series of positive terms – Tests of convergence (Comparison test, Integral test, Comparison of ratios and D'Alembert's Ratio test) and Divergence – Alternating series – Leibnitz test – Series of positive and negative terms – Absolute and conditional convergence – Power Series – Convergence of exponential, logarithmic and Binomial Series.	
DIFFERENTIAL CALCULUS	12
Curvature – Cartesian and Parametric Co-ordinates – Centre and Radius of curvature – Circle of curvature – Envelopes – Evolutes.	
FUNCTIONS OF SEVERAL VARIABLES	12
Partial derivatives – Euler's theorem for homogeneous functions – Total derivative – Differentiation of implicit functions – Jacobians – Maxima / Minima for functions of two variables – Method of Lagrange's multipliers – Taylor's expansion.	
ORDINARY DIFFERENTIAL EQUATIONS	12
Solution of second and higher order linear ODE with constant coefficients – Simultaneous first order linear equations with constant coefficients – Linear equations of second order with variable coefficients – Cauchy's and Legendre's linear equations – Method of variation of parameter – Simple Engineering Applications.	

**d. Activities:** Students shall be exposed to MATLAB programming to solve simple equations and solving differential equations.

**e. Learning Resources**

**i. TEXT BOOKS**

1. Grewal, B.S, "Higher Engineering Mathematics", Forty Third eighth Edition, Khanna Publishers, New Delhi, 2014.
2. Kanti B. Dutta., Mathematical Methods of Science and Engineering – Aidedwith MATLAB, Cengage Learning, New Delhi, 2013.

**ii. REFERENCE BOOKS**

1. Venkataraman. M. K., "Engineering Mathematics", Volume I and II Revised enlarged Fourth Edition, The National Publishing Company, Chennai, 2004.
2. Kreyszig E, Advanced Engineering Mathematics, 12th edition, John Wiley andSons, New York, 2010.
3. Glyn James., "Advanced Modern Engineering Mathematics", Third Edition, Pearson Education Ltd, New Delhi, 2004.
4. Ramana B.V., "Higher Engineering Mathematics", Tata McGraw Hill Co. Ltd.,New Delhi, 11th Reprint, 2010.
5. Veerarajan. T., "Engineering Mathematics (for first year)", Fourth Edition, Tata McGraw– Hill Publishing Company Limited, New Delhi, 2005.

Bali N. P and Manish Goyal, "Text book of Engineering Mathematics", Thirdedition, Laxmi Publications (P) Ltd., 2008.

Course Code	Course Name	L	T	P	C
	Mathematics Laboratory	0	0	2	1

**Category:** Foundation Course

**a. Preamble**

This course promotes students to develop problem solving skills in Engineering and become proficient in Microsoft Excel and MATLAB software tool to solve simple Engineering problems.

**b. Course Outcomes**

After successful completion of the course, the students will be able to

CONo.	Course Outcome	Knowledge Level
CO1	Solve simple exercises using built-in functions in MS-Excel	K3
CO2	Analyze the numerical data in MS-Excel and interpret using plots	K3
CO3	Apply basic commands in MATLAB to solve matrices	K3
CO4	Demonstrate the usage of polynomials and symbolic math tool in MATLAB	K3
CO5	Interpret numerical data in MATLAB using 2D & 3D plot functions	K3

**c. Course Syllabus**

**Total: 20 Periods**

**MATHEMATICS LABORATORY**

**Electronic Spreadsheets**

**(6 Periods)**

- 1) Introduction to Microsoft Excel environment and menu options
- 2) Usage of Built-in functions in Microsoft Excel
- 3) Data analysis and Interpretation in Microsoft Excel

**MATLAB (14 Periods)**

- 4) Introduction to MATLAB computing environment and basic commands in MATLAB
- 5) Files and Operators in MATLAB
- 6) Matrices in MATLAB
- 7) Polynomials in MATLAB and Curve fitting
- 8) Solving equations in MATLAB-Symbolic Math tool
- 9) Differentiation and Integration in MATLAB
- 10) Graphics in MATLAB

**d. Activities**

Students shall be given exposure in Microsoft Excel and MATLAB computing environment to solve simple numerical problems.

**e. Learning Resources**

**i. TEXT BOOK**

1. Gilat, A., 2004. *MATLAB: An introduction with Applications*. John Wiley & Sons.

**ii. REFERENCE BOOKS**

1. Lopez, C.P., 2014. *MATLAB Differential and Integral Calculus*, 1<sup>st</sup> Edition, Springer Apress, 2014
2. Palm, W.J., 2019. *Matlab for engineering applications*. Mcgraw-Hill College.

Course Code	Course Name	L	T	P	C
GE101	Principles of Engineering	3	0	0	3

**Category:** Foundation Courses (Engineering Science Course)

**a. Preamble**

This course enables the students to understand the importance of engineering discipline and real-time challenges in problem solving. This course focuses on introducing basic principles, physical laws and mathematical foundations that every engineer should know for the analysis of any engineering problem. The course further facilitates to learn the principles of computational engineering tools.

**b. Course Outcomes**

After successful completion of the course, the students will be able

CO. No.	Course Outcome	Knowledge Level
CO1	To demonstrate the qualities of professional engineer	K2
CO2	To apply the fundamental dimensions and units in engineering applications	K3
CO3	To utilize the mathematical concepts in engineering	K3
CO4	To explain the material properties for engineering applications.	K2
CO5	To utilize the concept of computational tools	K3

**c. Course Syllabus**

**Total: 45 Hours**

**IMPORTANCE OF ENGINEERING**

7

Engineering Profession – Realizing the Importance of Engineering – Common Traits and Habits of Engineers – Expected Quality of Engineering Graduates – Brief about various Engineering Disciplines - Expected Educational Outcomes – Class Room Discipline – Studying Practice – Engineering Design Process – Team Work.

**ENGINEERING FUNDAMENTALS**

9

Fundamental Dimension and Units – Physical Quantity, SI Units and Symbol – Derived Units – SI Units in Everyday Life – System of Units and Conversion Factors – Unit Conversion – Dimensional Homogeneity – Numerical versus Symbolic Solution – Physical Laws and Observations – Length, Time, Mass, Force and related Parameters – Newton's Laws of Mechanics – Temperature related Parameters.

**MATHEMATICS IN ENGINEERING**

9

Linear Models – Linear Equations and Slopes – Linear Interpolation – System of Linear Equations – Nonlinear Models – Polynomial Functions – Stopping Sight Distance – Deflection of a Beam – Exponential and Logarithmic Models – Cooling of Piece of Metal – Decibel Scale – Applications of System of Linear Equations – Basic Integral Calculus.

**ENGINEERING MATERIALS**

7

Phases of Matter – Physical, Mechanical and Electrical Properties of Materials – Solid Materials: Light Weight Metals – Copper and its Alloys – Iron and Steel – Concrete – Wood – Plastics – Silicon – Glass – Composites – Fluid Materials: Air and Water.

**Electronic Spreadsheets**

Microsoft Excel – Basic Ideas – Cells and their Address – Creating Formulas in Excel – Excel Functions – Plotting – Matrix Computation– Curve Fitting with Excel.

**MATLAB**

Basic Ideas – MATLAB Built-in Functions – Importing Data Files into MATLAB – Plotting– Curve Fitting with MATLAB – Symbolic Mathematics with MATLAB.

**d. Activities:** Students shall be exposed to the use of certain concepts of physics, mathematics and selection of materials for engineering design and process applications and to solve simple engineering problems using Excel and MATLAB.

**e. Learning Resources****iii. TEXT BOOK**

1. Saeed Moaveni, “Engineering Fundamentals: An Introduction to Engineering”, Fourth Edition, Cengage Learning, 2011.

**iv. REFERENCE BOOKS**

1. Kirk D.Hagen, “Introduction to Engineering Analysis”, Fifth Edition, Pearson Education, 2014.
2. Elizabeth A. Stephan, William J. Park, Benjamin L.Sill, David R. Bowman, Matthew W. Ohland, “Thinking like an Engineer: An Active Learning Approach”, Second Edition, Pearson Education, 2012.
3. Ronald W. Larsen, “Engineering with Excel”, Pearson Education, 2018.
4. Delores M. Etter, “Introduction to MATLAB”, Pearson Education, 2018.