Section A:								
Course Code	MAT1001							
Course Title	Engineering Mathematics 1							
Course Credits	4	**No. of Contact Hours/week**	**L:**	3	**T:**	1	**P:**	0
School	School Of Natural Sciences							
Offered By	Mathematics							
Method of Instruction:	In Person	**Offered in:**	Monsoon Semeste	Full Semster				
Check each box, when applicable, if the course covers one or more of the below listed attributes								
☐	**REALS**	☐	**VELS**	☐	**DISE**			
Prerequisites	None							
None								
Fill this, if applicable: A Similar Course Was Offered With Code ..... In Year								

NOTE:

Section B:This course is offered as (use checkbox) for which Programs			
☒	Major Core for:	All B.Tech. branches	Not required
☐	Major Elective for:	Enter The Name Of the Program(S) For Which This Is a Major Elective	Instructor's Approval
☐	UWE for:	Enter The Name Of the Program(S) For Which This Can Be A UWE	Instructor's Approval
☐	Project /UG Thesis / Internship	Any Other Information	Instructor's Approval
☐	CCC for:	Choose a Category	Instructor's Approval
☐	Specialization (If applicable)	Mention The Specialization	Instructor's Approval
☐	Minor (If applicable)	Mention The Minor(S)	Instructor's Approval
Estimated No. of Seats:	540	Estimated Number of Sections	18

Section C: State the Program Learning Goals of the Major Degree Program mapped to the Core Course (Applicable to Major Core courses only)
PLG
PLG
PLG

Section D: State the Course Objectives / Aim (Specific details of what the course intends to achieve in terms of student knowledge and ability. Items should begin with phrases such as "To provide students with …", "To enable students to …", "To develop students' skills in …" and so on.)
• Provide a strong foundation in calculus, essential for engineering applications. • Understand and analyze multivariable functions and apply optimization strategies. • Introduce and explore advanced integration methods, including double and triple integrals. • Equip students with the tools of vector calculus, enabling them to understand and apply key theorems to engineering problems. • Foster critical thinking and problem-solving abilities through mathematical modeling and analytical reasoning.

Section E: State the Learning Outcomes (A list of what students will know or be able to do as a result of successfully completing the course. Should be expressed as knowledge, skills, or attitudes.)
On successful completion of the course, students will be able to:
1. Derive And Solve Mathematical Models Of Physical Systems, If Necessary With The Aid Of Mathematical Software. 2. Present Mathematical Solutions In A Concise And Informative Manner. 3. Understand And Apply Basic Concepts, Results And Methods From Multivariate Calculus Concerning Limits, Continuity, Differentiation, Multiple Integration, Line And Surface Integrals.

Section F: State if course contributes to any skill development
Click Here To List Course Contribution To Skill Development

Section G: Module-wise Curriculum Content (Syllabus, Lab work, Project, Term paper, Group work, etc.)
1. Review of one-variable calculus (6 hours) 2. Parametric curves: plots, tangent, arc-length, polar coordinates, derivatives and integrals. (5 hours) 3. Functions of several variables: graphs, level curves and surfaces, partial derivatives, differentiation of functions of several variables, gradient, unconstrained and constrained optimization. (10 hours) 4. Double and triple integrals: interated integrals, polar coordinates, cylindrical and spherical coordinates, change of variables. (7 hours) 5. Vector fields: divergence and curl, Line and surface integrals, Fundamental Theorems of Green, Stokes and Gauss. (11 hours) Add additional sheet(s), if required

Section H: Text Book(s), Reference book(s) and any other study material

Books:
1. A Banner, The Calculus Lifesaver, Princeton University Press.
2. James Stewart, Essential Calculus – Early Transcendentals, Cengage.
3. G B Thomas and R L Finney, Calculus and Analytic Geometry, Addison-Wesley
4. Basic Multivariable Calculus by J E Marsden, A J Tromba and A Weinstein, 1st edition, Springer (India).
5. Calculus, II and III, by Jerrold Marsden and Alan Weinstein, Springer.
http://www.cds.caltech.edu/~marsden/volume/Calculus/

Lecture Videos:
1. Single Variable Calculus lectures by David Jerison, MIT OCW.
https://ocw.mit.edu/courses/18-01-single-variable-calculus-fall-2006/video_galleries/video-lectures/
2. Multivariable Calculus lectures by Denis Auroux, MIT OCW
https://ocw.mit.edu/courses/18-02-multivariable-calculus-fall-2007/video_galleries/video-lectures/

Section I: Please fill in all the rows for the applicable rows. For evaluation component not included in the list, use the last two rows and mention the evaluation component in the corresponding last column. Please see the NOTE below this box for the prorate policy.

	Component	Weightage %	Missed Graded Component Policy	Use of Gen AI policy	Any Other Information
☒	Mid Sem Exam	30.00	Retake of Graded Component	Prohibited: No Gen AI	other info
☒	End Sem Exam	40.00	I grade awarded on approval from De	Prohibited: No Gen AI	other info
☒	Quiz(s)	30.00	Choose the best n from m componen	Prohibited: No Gen AI	other info
☐	Assignment(s)	0.00	Please Select	Please Select	other info
☐	Lab	0.00	Please Select	Please Select	other info
☐	Project	0.00	Please Select	Please Select	other info
☐	Case Studies	0.00	Please Select	Please Select	other info
☐	Group Discussion	0.00	Please Select	Please Select	other info
☐	Any Other Component	0.00	Please Select	Please Select	other info
☐	Any Other Component	0.00	Please Select	Please Select	other info
	Total **Weightage** (%)	100.00			

Note:
a) While you may mark multiple evaluation components for pro-rate. However, if a particular student misses multiple evaluations, *not more than 20% of the evaluation can be prorated for that student.*
b) The best n out of m: Please make sure that n < m.
c) Award of 'I' grade is applicable only in the case of the End-term Exam. Additionally, end-term exams or final assessments cannot be prorated or waived.
d) Individual faculty can decide the prorate policy for each component.
e) 'None' as an option can only be used in exceptional cases, for example lab evaluated by an external expert

Section J: Grading Policy (*Tick the one You intend to follow)*				
☐	**Relative** Grading	90% Will Guarantee A And 40% Will Guarantee D. Cutoffs May Be Lowered From These Based On Difficulty Level Of Assessment.		Total Marks Will Be Rounded Up
☐	Absolute Grading	**Grade**	**Range** *(replace M's appropriately)*	Please Mention The Rounding Off Policy And Any Other Information
		A	M1 <= marks <= M2	
		A-	M1 <= marks <= M2	
		B	M1 <= marks <= M2	
		B-	M1 <= marks <= M2	
		C	M1 <= marks <= M2	
		C-	M1 <= marks <= M2	
		D	M1 <= marks <= M2	
		E	M1 <= marks <= M2	
		F	M1 <= marks <= M2	

Section K: Details about instructors teaching this course. For multiple instructors in a course, mention each name once after the other					
Name of the Instructor(s):	Amber Habib Charu Sharma Sneh Lata Prof XYZ Prof ABC			**Section(s)**	List Sections L1, L2, L3
Office Location	A111-B A111-D A111-C K 120 L 325	**Tel. Extension***	836 254 256	**Email:**	amber.habib@snu.edu.in charu.sharma@snu.edu.in sneh.lata@snu.edu.in abc@snu.edu.in xyz@snu.edu.in
About the Instructor(s): Click Here To Enter About 250 Words about each instructor teaching the course`					

***** - Optional

Section L: Office Hours
Please let the students know the day(s) and time slot(s) for any consultation. You may update this at the start of the semester.

Section M: Any other information
This course replaces the earlier MAT103 Mathematical Methods I. Students with backlog in MAT103 should clear MAT1001 in its place.