Section A:								
Course Code	MAT3XX							
Course Title	Mathematical Modelling							
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	MAT102, MAT160 or 161, MAT385							
MAT150								
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:	Mathematics	Not required
☐	Major Elective for:	Enter The Name Of the Program(S) For Which This Is a Major Elective	Instructor's Approval
☒	UWE for:	All	Not required
☐	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)	Mathematics	Not required
Estimated No. of Seats:	40	Estimated Number of Sections	1

Section C: State the Program Learning Goals of the Major Degree Program mapped to the Core Course (Applicable to Major Core courses only)
PLG2
PLG3
PLG4,5

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.)

1. To introduce a variety of common model types that occur in various natural phenomena.
2. To enable students to imagine and develop models, analyse and criticize different model systems.
3. Provide hands-on experience in applying advanced mathematical concepts to real-world applications.

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. Translate Real-World Problems Into Mathematical Form (Model).
2. Find Solutions, Either Exact Or Approximate, To Mathematical Models.
3. Assess The Quality And Reliability Of Mathematical Models.
4. Interpret And Communicate Their Analyses In Written And Oral Form.

Section F: State if course contributes to any skill development

Use Of Programming And Languages/Software Such As R, Python, Matlab.

Section G: Module-wise Curriculum Content (Syllabus, Lab work, Project, Term paper, Group work, etc.)
• Data and Models • Simulations in MATLAB • Review of basic probability, Probabilistic view of systems • Probabilistic modelling • Deterministic and probabilistic view of natural systems • Review of First order ODE and solution techniques • Examples of applications of first order ODE • Matrix models, Leslie matrix, Population dynamics • Projects Add additional sheet(s), if required

Section H: Text Book(s), Reference book(s) and any other study material
1. A First Course in Mathematical Modeling by Frank R. Giordano, William P. Fox, Steven B. Horton, 2013 2. A concrete approach of Mathematical Modelling, by Mike Mesterton-Gibbon, Wiley and Sons, 1995. 3. Brauer, Fred, Carlos Castillo-Chavez, and Carlos Castillo-Chavez. Mathematical models in population biology and epidemiology. Vol. 2. No. 40. New York: Springer, 2012. 4. Advanced Engineering Mathematics, by Erwin Kreyszig, Wiley.

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 allowed	other info
☒	End Sem Exam	40.00	I grade awarded on approval fro	Prohibited: No Gen AI allowed	other info
☐	Quiz(s)	0.00	Please Select	Please Select	other info
☐	Assignment(s)	0.00	Please Select	Please Select	other info
☐	Lab	0.00	Please Select	Please Select	other info
☒	Project	30.00	Does not contribute if missed th	Restricted: Limited access allov	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

<table>
<tr><td colspan="4">Section J: Grading Policy (Tick the one You intend to follow)</td><td></td></tr>
<tr><td>☒</td><td>Relative Grading</td><td colspan="2">90% Will Guarantee An A And 40% Will Guarantee A D.</td><td>Total marks to be rounded up</td></tr>
<tr><td rowspan="11">☐</td><td rowspan="11">Absolute Grading</td><td>Grade</td><td>Range (replace M's appropriately)</td><td></td></tr>
<tr><td>A</td><td>M1 <= marks <= M2</td><td rowspan="10">Please Mention The Rounding Off Policy And Any Other Information</td></tr>
<tr><td>A-</td><td>M1 <= marks <= M2</td></tr>
<tr><td>B</td><td>M1 <= marks <= M2</td></tr>
<tr><td>B-</td><td>M1 <= marks <= M2</td></tr>
<tr><td>C</td><td>M1 <= marks <= M2</td></tr>
<tr><td>C-</td><td>M1 <= marks <= M2</td></tr>
<tr><td>D</td><td>M1 <= marks <= M2</td></tr>
<tr><td>E</td><td>M1 <= marks <= M2</td></tr>
<tr><td>F</td><td>M1 <= marks <= M2</td></tr>
</table>

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):	Please Enter Your Full Name Prof XYZ Prof ABC			**Section(s)**	List Sections L1, L2, L3
Office Location	Office K 120 L 325	**Tel. Extension***	999	**Email:**	.....@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
Any other information you would like to specify in relation to the above course