

Term Project

For the term project, you have to submit your code/tool and one document with detailed description of how to run the code/software you have developed.

Additionally, use the data below and run your code/tool based on the instructions below. Record your screen while performing analysis. You can use MS Teams record function to create the video. Please keep your videos short.

Material Data base

Sl. No.	Fibre Name	E1 (GPa)	E2=E3 (GPa)	G12 (GPa)	nu12	nu23
0	Carbon	232	15	24	0.279	0.49
1	AS4	225	15	15	0.2	0.25
2	E-Glass 1200 tex	80	80	33.33	0.2	0.2
3	T300	230	15	15	0.2	0.25
4	E-Glass	72.4	72.4	30.2	0.2	0.2

Sl. No.	Matrix Name	E1 (GPa)	nu12
0	Epoxy -1	3.45	0.35
1			
2	Epoxy -2	5.35	0.35
3			
4	3501-6 Epoxy	4.2	0.34
5			
6	BSL914c Epoxy	4	0.35
7			
8	DY063 Epoxy	3.35	0.35
9			

- Based on the Sl. No. of your name, choose the combination of the material properties for your composite. Choose the fibre and the matrix based on the 1st and second digit of the serial number.
- For your calculations: Take the volume fraction as $0.50 + \text{Sl. No.}/1000$

For example, Vedant Saraswat is number 16, so his composite system is AS4+ BSL914c Epoxy and volume fraction is 0.516

Perform the following tasks using the code/software developed by you.

1.) Calculate the effective properties and plot the variation of the Young's modulus, shear modulus and Q_{16} as a function of angle ϑ . The plots should look continuous. Use double precision for the computation.

2.) For the layup sequence $[0, +/-\text{last two digits of your roll no.}, 90]_s$, calculate the A, B and D matrix if the thickness of all the lamina is the same and total thickness is 1mm

3.) Applied load $N_x = 100 \text{ Nm}$, $N_y = 0$, $N_{xy} = 0$; Calculate the margin of safety for the 0 and 90° lamina. Use representative values of for the various strength parameters.

Submit a report with the only three results derived from your code/tool. Also, solve manually the three problems and scan it as a pdf.

Upload the following files in one zip folder with name Roll No. Zip

- 1.) Source code and all other files related to the code/tool
- 2.) A word document with all the details of how one can run your code
- 3.) A word document with the three results
- 4.) A scanned pdf document with manual solution to the same three problems

Dropbox link for file upload: <https://www.dropbox.com/request/YfhYhJBXglt8fP8GaxKg>

Serial No	Roll No	Name
1	17ME10031	Kapadia Vatsal Nileshkumar
2	17ME33001	Abhijeet Rameshwar Sonkusare
3	17ME33008	Mukesh Ranjan
4	17ME33014	Sankhadeep Bhattacharyya
5	17ME33017	Tushar Moreshwar Patle
6	17ME33018	Vaibhav Kant Agrawal
7	17ME33019	Ved Prakash
8	17ME33027	Anurag Porte
9	17ME33028	Apoorv Jain
10	17ME33031	Chandra Prakash Sahwal
11	17ME33038	P M Tarun Santosh
12	17ME33039	Prayas Prakash Sambhare
13	17ME33040	Pushkar Singh
14	17MF10020	Perli Anuroop Anand
15	17MF10025	Sumit Adwani
16	17MF10029	Vedant Saraswat
17	17MF10034	Aastha Sharma
18	17MF3FP18	Ankit Anjinee Pandey
19	17MF3IM17	Tuhin Atta
20	17MF3IM24	Jatin Uniyal
21	20ME63R03	Raushan Kumar
22	20ME63R04	Subhajit Nath
23	20ME63R05	Jyotirmoy Brahma
24	20ME63R07	Baliram Kumar
25	20ME63R08	Deepanshu Aggarwal
26	20ME63R09	Dhruvil Jayantibhai Changani
27	20ME63R11	Yash Hareshbhai Bhayani
28	20ME63R12	Balasaheb Pandit Bhosale
29	20ME63R13	Mdl Vignesh
30	20ME63R18	Subham Shaw
31	20ME63R19	Kasi Visweswara Rao Dasari
32	20ME63R21	Hitesh Prakash Patil
33	20ME63R22	Poojyapreet Patel
34	20ME63R25	Akhil Prem
35	20ME63R28	Iftikhar Alam
36	20ME63R29	Vikram Kumar Muthkani
37	20ME63R35	Agrawal Rahul Vishwanath
38	20ME63R39	Nikhil Anand
39	20ME63R41	Akshay Bajirao Shinde
40	20ME63R44	Saksham Kumar
41	20ME63S01	Shivanshu Zamdagni