



FACULTY OF ENGINEERING

**BEE2053/EE305 Numerical Analysis Jan – Apr 2022
ASSIGNMENT**

No.	Student Name	Student ID
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Instructor: Dr. Harvinder Kaur Lehl

Course Learning Outcome (CLO)	*Domain / **BT Level	PLO	WK	WP
CLO5	Solve engineering problems by using MATLAB	C6	PLO5	WK6 WP1 WP3

PLO 5	MODERN TOOL USAGE - Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations (WK6);
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	Q1	Q2	Q3	Q4	Obtained Marks (/10)
Assignment					

- Fill in names and id and submit this page/file with Matlab files (total 6 files).
- Maximum number of students in each group is 5.
- Deadline for submission is **31st March 2022 @ Microsoft Teams**. Late submission will be penalized by two marks for every day.
- Use **only Matlab** to solve all the following questions:

- Q1 Determine the real root of $f(x) = 2 \cos(x) - x$ using 20 iterations of the false position method, with initial guesses of $x_l = 3$ and $x_u = 0$ (2.5 marks)

(Final Answer: Root= 1.0355)

- Q2 Use Gauss elimination method to solve the following system:

$$\begin{aligned}2x + y + z &= 10 \\3x + 2y + 3z &= 18 \\x + 4y + 9z &= 16\end{aligned}$$

(2.5 marks)

(Final Answer: $x = 7; y = -9; z = 5$)

- Q3 A company advertises that their plastic concrete framework can be used 300 times in casting before it starts to deteriorate. The probability that their product can sustain up to 350 of casting is given in the following formula. Find the probability that the frameworks can last up to 350 times by using the Simpson's 3/8 rule with $n = 300$

$$f(x) = \frac{x}{100 + x}$$

(2.5 marks)

(Final Answer: $I = 38.2217$)

- Q4 Using Heun's Method, compute the value of y at $x = 10$ taking $h = 0.1$, Given

$$\frac{dy}{dx} = x^3 - 2x^2 + x - 10 \text{ and } y(0) = 3$$

(Final Answer: $f(10) = 1783.55$)

(2.5 marks)

END OF QUESTIONS