**Department of Electrical Engineering**

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| **Faculty Member:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **Dated: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
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| **Section:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **Semester: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
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**EE-232 : Signals and Systems**

**Lab 13: Frequency Modulation (Open-ended Lab)**

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|  |  | **PLO4 –CLO3** | | **PLO5-CLO3** | **PLO8-CLO4** | **PLO9-CLO4** |
| **Name** | **Reg. No** | **Viva / Quiz / Lab Performance** | **Analysis of data in Lab Report** | **Modern Tool Usage** | **Ethics and Safety** | **Individual and Team Work** |
|  |  | **5 Marks** | **5 Marks** | **5 Marks** | **5 Marks** | **5 Marks** |
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**Lab 13: Frequency Modulation**

**Lab Instructions**

* This lab activity comprises of lab exercises that the student must perform
* The reports are to be submitted on LMS.
* The students should perform and demonstrate each lab task separately for step-wise evaluation
* Only those tasks that completed during the allocated lab time will be credited to the students. Students are however encouraged to practice on their own in spare time for enhancing their skills.

**Lab Report Instructions**

All questions should be answered precisely to get maximum credit. Lab report must ensure following items:

* Lab objectives
* MATLAB codes
* Results (graphs/tables) duly commented and discussed
* Conclusion

## Lab Task

#### In the previous lab, amplitude modulation (AM) of a message signal with a carrier signal was introduced. The AM implementation required multiplying the message and carrier signals to make the transmission. In this lab, another type of modulation called frequency modulation (FM) will be considered.

#### This lab is of an “open-ended” nature and as such requires that students come up with their own implementation of FM. The students must generate carrier and message signals and use their own approach to apply the modulation. The modulated signal must then be demodulated to acquire the message signal at the receiving end. Results from both modulation and demodulation must be provided. Provide the code and plots in MatLab as well.

#### Students are strongly advised to NOT copy someone else’s solution.