Grading Rubric

# Lab 1: Introduction to MATLAB & Simulink (Total Marks: 20%)

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| Assessment Criteria | Excellent (100%) | Good (75%) | Satisfactory (50%) | Poor (25%)/Incomplete | Marks Allocated |
| MATLAB Code Accuracy | Code runs flawlessly; correct TF implementation. | Minor errors (e.g., misplaced labels). | Major errors (e.g., wrong TF formula). | Code fails to run or irrelevant. | /5% |
| Modified Transfer Function | Successfully altered parameters; clear rationale. | Modified but no explanation. | Partial modification (e.g., only numerator). | No modification attempted. | /3% |
| Step Response Plot | Professional plot (labels, title, grid). | Missing 1-2 elements (e.g., no grid). | Missing >2 elements or incorrect plot. | No plot submitted. | /4% |
| Analysis (Rise/Settling Time) | Correct `stepinfo()` usage; detailed comparison. | Minor calculation errors. | Incomplete analysis (e.g., only rise time). | No analysis provided. | /5% |
| Report Clarity | Neat, well-structured, answers explained. | Minor formatting issues. | Disorganized or lacks explanations. | Unsubmitted or illegible. | /3% |

# Lab 2: Transient Response of Second-Order Systems (Total Marks: 20%)

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| Assessment Criteria | Excellent (100%) | Good (75%) | Satisfactory (50%) | Poor (25%)/Incomplete | Marks Allocated |
| Plot (Multiple Responses) | All curves labeled; axes/title perfect. | Missing legend or minor labeling issues. | Incorrect responses or missing plots. | No plot submitted. | /5% |
| Modified ωₙ Analysis | Clear explanation of speed vs. ωₙ. | Correct but lacks depth. | Partial analysis (e.g., no comparison). | No analysis attempted. | /4% |
| Design Task (Correct ζ and ωₙ) | Accurate design; meets specs. | Design works but minor deviations. | Incorrect parameters but partial effort. | No design attempted. | /6% |
| Overshoot Comparison | Manual and MATLAB results match; detailed. | Minor discrepancies in values. | Only one method provided. | No comparison. | /3% |
| Report Quality | Professional; screenshots embedded. | Minor formatting issues. | Poorly organized or incomplete. | Unsubmitted. | /2% |

# Lab 3: PID Controller Design (CLO2 Focus) (Total Marks: 30%)

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| Assessment Criteria | Excellent (100%) | Good (75%) | Satisfactory (50%) | Poor (25%)/Incomplete | Marks Allocated |
| PID Tuning Method | Correct use of `pidtune()` or manual tuning. | Used `pidtune()` but no manual adjustments. | Manual tuning only; no justification. | No tuning attempted. | /10% |
| Achieved Design Specs | Overshoot <10%; meets all requirements. | Overshoot 10-15% or minor deviations. | Overshoot >15% but stable. | Unstable or no improvement. | /10% |
| Before/After Plots | Clear comparison; labeled and annotated. | Missing annotations or titles. | Only one plot provided. | No plots submitted. | /5% |
| Tuning Explanation | Detailed rationale for chosen gains. | Brief or vague explanation. | Minimal explanation (e.g., 'it works'). | No explanation. | /5% |

# Lab 4: Stability Analysis (Nyquist/Bode) - CLO3 (Total Marks: 30%)

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| Assessment Criteria | Excellent (100%) | Good (75%) | Satisfactory (50%) | Poor (25%)/Incomplete | Marks Allocated |
| Bode/Nyquist Plot | Correct plots with margins highlighted. | Minor errors (e.g., no margins). | Incorrect frequency range or scaling. | No plot submitted. | /10% |
| Stability Analysis | Accurate GM/PM; correct stability conclusion. | Correct GM/PM but unclear conclusion. | Errors in margin calculations. | No analysis. | /10% |
| Margins Calculation | Precise values; units included. | Minor rounding errors. | Incorrect values but partial effort. | No calculations. | /5% |
| Report Professionalism | Publication-ready; clear sections. | Minor formatting issues. | Disorganized or lacks screenshots. | Unsubmitted. | /5% |