| RAJASTHAN TECHNICAL UNIVERSITY, KOTA | |
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| **Lecture Plan** | |
| Session: | 2015-2016 |
| Semester: | 1st Semester (Odd - semester) |
| Name of Faculty: | Dr. D. K. Sambariya |
| Department: | Electrical Engineering |
| Course Name and Number: | M. Tech (PD) |
| Name of Subject (with code): | Modern Control System (1MPD4) |
| Batch Name/Discipline: | EE / Electrical Engineering |

| **Lecture Plan Details** | | |
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| **Lecture No.** | **Topic to be covered** | **Remark** |
| L-1 | Concept of state, state space representation of systems | |
| L-2 | Phase variable form | |
| L-3 | Examples on phase variable representation and transfer function model | |
| L-4 | Controller design | |
| L-5 | Canonical variable form | |
| L-6 | Physical variable form | |
| L-7 | Diagonalization | |
| L-8 | Relationship between<br>State equation and transfer function | |
| L-9 | Solution of state equation | |
| L-10 | Concept of controllability and types:<br>Solving systems for controllability; manual and MATLAB implementation | |
| L-11 | Observability and related examples | |
| L-12 | Eigen values and Eigenvector | |
| L-13 | Examples on eigenvalue and vectors | |
| L-14 | Importance of sampling | |
| L-15 | Mathematical analysis of sampling | |
| L-16 | Examples on sampling | |
| L-17 | Spectrum analysis of sampling process | |
| L-18 | Shanon's theorem | |
| L-19 | Signal reconstruction | |
| L-20 | Hold circuit | |
| L-21 | Z transform | |
| L-22 | Practice examples on z-transform | |
| L-23 | Inverse z transform | |
| L-24 | Examples on inverse z-transform | |
| L-25 | Difference equation | |
| L-26 | Examples on inverse z-transform | |

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| L-27 | Pulse transfer function | |
| L-28 | State variable representation of<br>Sampled data system | |
| L-29 | Examples on sampled data system | |
| L-30 | Solution of discrete state equation | |
| L-31 | Characteristic of nonlinear system | |
| L-32 | Type of non-linearity | |
| L-33 | Examples on non-linearities | |
| L-34 | Jump resonance | |
| L-35 | Limit cycle | |
| L-35 | Describing function method of analysis | |
| L-36 | Introduction to liapunov stability | |
| L-37 | Examples on liapunov stability | |
| L-38 | Stability definitions and theorems, | |
| L-39 | Liapunov function for linear system | |
| L-40 | Examples for stability using Liapunov | |