

**Course wise Teaching Plan for Session : Summer 2019****Course : MECHATRONICS****Faculty : himadri.majumder@raisoni.net - HIMADRI MAJUMDER**

Unit	Topic Code	Topic Covered	Date	Course	Section
1	1	Introduction to Mechatronics and its Applications	06/12/2018	BMEL208	C
1	2	Sensors: Position sensors- Potentiometer, LVDT, incremental Encoder	07/12/2018	BMEL208	C
1	4	Measurement Characteristics of sensor: Static and Dynamic;	13/12/2018	BMEL208	C
1	3	Proximity sensors-Optical, Inductive, Capacitive	14/12/2018	BMEL208	C
1	7	Actuators: Stepper motor, Servo motor, Solenoids	20/12/2018	BMEL208	C
1	5	Temperature sensor-RTD, Thermocouples; Force / Pressure Sensors-Strain gauges; Flow sensors-Electromagnetic	21/12/2018	BMEL208	C
2	10	Introduction to Mechatronics System Design; Identification of key elements of Mechatronics systems and represent into Block Diagram	03/01/2019	BMEL208	C
2	6	Block Diagram & Reduction principles	04/01/2019	BMEL208	C
2	13	Open and Closed loop Control System; Concept of Transfer Function; Block Diagram & Reduction principles	17/01/2019	BMEL208	C
2	8	Applications of Mechatronics systems: Household, Automotive, Industrial shop floor	18/01/2019	BMEL208	C
3	16	Introduction to PLC; Architecture of PLC; Selection of PLC	24/01/2019	BMEL208	C
3	9	Ladder Logic programming for different types of logic gates	25/01/2019	BMEL208	C
4	19	Introduction to Signal Communication & Types-Synchronous, Asynchronous	31/01/2019	BMEL208	C
3	11	Latching; Timers, Counter	01/02/2019	BMEL208	C
4	22	Serial, Parallel; Bit width, Sampling theorem, Aliasing, Sample and hold circuit, Sampling frequency	07/02/2019	BMEL208	C
3	12	Practical examples of Ladder Programming. Applications in Industry	08/02/2019	BMEL208	C
5	24	Transfer Function based modeling of Mechanical, Thermal and Fluid system; concept of Poles & Zeros	14/02/2019	BMEL208	C



Course wise Teaching Plan for Session : Summer 2019

Course : MECHATRONICS

Faculty : himadri.majumder@raisoni.net - HIMADRI MAJUMDER

Unit	Topic Code	Topic Covered	Date	Course	Section
4	14	Sample and hold circuit, Sampling frequency	15/02/2019	BMEL208	C
4	15	4 bit Successive Approximation type ADC; 4 bit R2R type DAC, Current and Voltage Amplifier	22/02/2019	BMEL208	C
5	25	Introduction to Bode Plot, Gain Margin, Phase Margin	28/02/2019	BMEL208	C
5	17	Stability Analysis using Routh Hurwitz Criterion; Bode Plot	01/03/2019	BMEL208	C
5	26	Frequency Domain Parameters-Natural Frequency, Damping Frequency and Damping Factor	07/03/2019	BMEL208	C
5	18	Mapping of Pole Zero plot with damping factor, natural frequency and unit step response	08/03/2019	BMEL208	C
5	27	Mapping of Pole Zero plot with damping factor	14/03/2019	BMEL208	C
6	20	PI, PD and PID control systems in parallel form	15/03/2019	BMEL208	C
6	28	Proportional (P), Integral (I) and Derivative (D) control actions	21/03/2019	BMEL208	C
6	21	Unit step Response analysis via Transient response specifications: Percentage overshoot, Rise time, Delay time, Steady state error	22/03/2019	BMEL208	C
6	29	Unit step Response analysis via Transient response specifications	28/03/2019	BMEL208	C
6	30	Linear Quadratic Control (LQR)	04/04/2019	BMEL208	C
6	23	Manual tuning of PID control;	29/04/2019	BMEL208	C