## MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute, Affiliated to R.G.P.V. Bhopal)

### Department of Electronics Engineering

#### Subject Name/ **CO Statement** CO CO Semester Code Attainment Attainment Target (%) (%) Semester - 3 \*140302/\*200302 Analyze the characteristics of various engineering 65 CO1 89 Electronics – I materials. CO2 Design any diode, and transistor circuits. 65 83 CO3 Analyze any transistorized circuits for any given 65 88 specification. CO4 Design Analog circuits. 65 49 CO5 Examine the working of transistor based circuits. 65 46 CO6 Examine basic construction of feedback circuits and 65 46 their application. \*140303/\*200303 CO1 Simplify Boolean expression using K-Map, & Its 60 88 **Digital Circuits** Implementation using logic gates. CO2 Design any logic circuit using Universal Gate. And Systems 60 91 CO3 Design various sequential and combinational 60 82 circuits. CO4 Assemble the various Shift register using flip flops. 60 74 CO5 Analyze the different types of semiconductor 60 73 memories. CO6 Design transistor based digital circuits. 60 53 \*140304/\*200304 Apply the fundamental concepts in solving and CO1 60 71 Network Theory analyzing different Electrical networks Design the coupled circuits. CO2 60 69

#### CO Attainment for the academic session July - Dec 2018

|              |                                               | CO3 | Select appropriate and relevant technique for solving<br>the Electrical network in different conditions.                                    | 60 | 68 |
|--------------|-----------------------------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------|----|----|
|              |                                               | CO4 | Evaluate the steady state response and transient response of circuit.                                                                       | 60 | 29 |
|              |                                               | CO5 | Apply mathematics in analyzing and synthesizing<br>the networks in time and frequency domain.                                               | 60 | 32 |
|              |                                               | CO6 | Examine the performance of any circuit using two port network.                                                                              | 60 | 33 |
|              | *140305/*200305<br>Signals And                | CO1 | Analyze the basic signal and their mathematical description.                                                                                | 65 | 83 |
|              | Systems                                       | CO2 | Analyze the spectral characteristics of continuous-<br>time and discrete time signals.                                                      | 65 | 73 |
|              |                                               | CO3 | Evaluate the properties of continuous-time and discrete time signals.                                                                       | 65 | 85 |
|              |                                               | CO4 | Analyze the properties of LTI continuous-time and discrete time systems using transform.                                                    | 65 | 79 |
|              |                                               | CO5 | Evaluate the convolution and response of continuous-time and discrete time systems with respect to any input.                               | 65 | 46 |
|              |                                               | CO6 | Design a block diagram of LTI system corresponding to given differential/ difference equation.                                              | 65 | 47 |
| Semester - 5 | BELL502:<br>Microprocessor and<br>Interfacing | CO1 | Explain the architecture and organization of microprocessor 8086, advance microprocessors and microcontroller 8051                          | 60 | 94 |
|              |                                               | CO2 | Develop skill in assembly language programming for 8086 and 8051.                                                                           | 60 | 86 |
|              |                                               | CO3 | Interface memory and I/O devices using different logic devices and interfacing chips/PPI,s                                                  | 60 | 94 |
|              |                                               | CO4 | Analyze basic idea about interrupt processing, the data transfer schemes and its applications.                                              | 60 | 80 |
|              |                                               | CO5 | Distinguish between different types of general<br>purpose programmable peripheral devices viz 8254,<br>PIT,8259,PIC,8257 DMA and 8251USART. | 60 | 76 |

| BELL503:<br>Electromagnetic<br>Fields         COI         Describe static and dynamic electric and magnetic<br>fields for technologically important structures.         65         85           CO2         Apply vector calculus to static electric-magnetic<br>fields in different engineering situations.         65         71           CO3         Use boundary conditions for electric and magnetic<br>fields at the interface of two different media.         65         85           CO4         Analyze         Maxwell equations in different forms<br>(differential and integral) and apply them to diverse<br>engineering problems.         65         68           CO5         Evaluate Poynting vector and apply Poynting vector<br>theorem in problems.         65         68           CO6         Examine the phenomena of wave propagation in<br>different media and describe the phenomena of<br>reflection of such waves in plane boundaries<br>between homogeneous media.         72           BELL504: Linear<br>Control Theory         CO1         Coll calculate the transfer function of feedback control<br>system using Block diagram and Signal flow graph<br>method.         60         84           CO3         Distinguish various controllers.         60         84           CO4         Co4 calculate the tansfer function of a closed-loop<br>control system using various methods.         60         83           CO3         Distinguish various controllers.         60         84         60         83           CO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                  | an t   |                                                       | <b>10</b> |    |
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| BELL503:<br>Electromagnetic<br>Fields         CO1<br>CO2<br>CO2<br>CO2<br>CO2<br>Apply vector calculus to static electric-magnetic<br>fields in different engineering situations.         65         85           CO3<br>Fields         Apply vector calculus to static electric-magnetic<br>fields in different engineering situations.         65         71           CO3<br>Fields         Use boundary conditions for electric and magnetic<br>fields at the interface of two different media.         65         85           CO4<br>Analyze Maxwell equations in different forms<br>(differential and integral) and apply them to diverse<br>engineering problems.         65         68           CO5<br>Evaluate Poynting vector and apply Poynting vector<br>theorem in problems.         65         68           CO6<br>Examine the phenomena of wave propagation in<br>different media and describe the phenomena of<br>reflection of such waves in plane boundaries<br>between homogeneous media.         72           BELL504: Linear<br>Control Theory         CO1<br>Calculate the transfer function of feedback control<br>system using Block diagram and Signal flow graph<br>method.         60         86           CO2<br>Evaluate the time domain response of first &<br>Second order system for different standard inputs.         60         84           CO3<br>Distinguish various controllers.         60         84         60         83           CO4<br>Co5<br>Determine the (absolute) stability of a closed-loop<br>control system using various methods.         60         74           CO4<br>Co4<br>Co4<br>Co4<br>Co4<br>Co4<br>Co4<br>Co4<br>Co4<br>Describe the various aspects of                                                                                                                                                                                                                                                                                                                                                                                      |  |                  | CO6    |                                                       | 60        | 89 |
| Electromagnetic       Fields for technologically important structures.       85         Fields       CO2       Apply vector calculus to static electric-magnetic fields in different engineering situations.       65       71         CO3       Use boundary conditions for electric and magnetic fields at the interface of two different media.       65       85         CO4       Analyze Maxwell equations in different forms of engineering problems.       65       68         CO5       Evaluate Poynting vector and apply them to diverse engineering problems.       72         CO6       Examine the phenomena of wave propagation in different media.       65       68         CO6       Examine the phenomena of wave propagation in different media.       65       72         BELL504: Linear Co11       CO1       Calculate the transfer function of feedback control system using Block diagram and Signal flow graph method.       85         CO2       Evaluate the time domain response of first & 60       86       86         CO3       Distinguish various controllers.       60       84         CO4       Calculate steady state error for type 0.1, & 2 system.       60       62         CO5       Determine the (absolute) stability of a closed-loop control system using various methods.       60       83         CO4       Calculate steady state error for type 0.1, & 2 system. <td< td=""><td></td><td>BELI 503.</td><td>COL</td><td></td><td>65</td><td></td></td<>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | BELI 503.        | COL    |                                                       | 65        |    |
| Fields       CO2       Apply vector calculus to static electric-magnetic fields in different engineering situations.       65       71         CO3       Use boundary conditions for electric and magnetic fields at the interface of two different media.       65       85         CO4       Analyze Maxwell equations in different forms (differential and integral) and apply them to diverse engineering problems.       65       68         CO5       Evaluate Poynting vector and apply Poynting vector       65       68         CO6       Examine the phenomena of wave propagation in different media and describe the phenomena of reflection of such waves in plane boundaries between homogeneous media.       72         BELL504: Linear Control Theory       CO1       Calculate the transfer function of feedback control system using Block diagram and Signal flow graph method.       85         CO2       Evaluate the time domain response of first & 60       86         CO3       Distinguish various controllers.       60       84         CO4       Calculate steady state error for type 0,1,& 2 system.       60       62         CO5       Determine the (absolute) stability of a closed-loop control system using various appects of sampling theorem viz. Aliasing, signal distortion.       60       83         CO3       Distinguish various aspects of sampling theorem viz. Aliasing, signal distortion.       60       83         CO5       Determi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                  |        |                                                       | 05        | 85 |
| Fields in different engineering situations.       71         CO3       Use boundary conditions for electric and magnetic fields at the interface of two different media.       65       85         CO4       Analyze Maxwell equations in different forms (differential and integral) and apply them to diverse engineering problems.       65       68         CO5       Evaluate Poynting vector and apply Poynting vector theorem in problems.       65       68         CO6       Examine the phenomena of wave propagation in different media and describe the phenomena of reflection of such waves in plane boundaries between homogeneous media.       72         BELL504: Linear Control Theory       CO1       Calculate the transfer function of feedback control system using Block diagram and Signal flow graph method.       60       85         CO2       Evaluate the time domain response of first & 60       86       86         CO3       Distinguish various controllers.       60       84         CO4       Calculate steady state error for type 0.1, & 2 system.       60       62         CO5       Determine the (absolute) stability of a closed-loop control system using various methods.       60       83         CO4       Colc control system equations in state variable form.       60       83         CO5       Determine the concepts of Digital Communication conserver of type the digital modulation techniques in 60       53                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | -                | $CO^2$ |                                                       | 65        |    |
| BELL504: Linear<br>Control Theory       Col       Analyze Maxwell equations in different forms<br>(differential and integral) and apply them to diverse<br>engineering problems.       65       72         BELL504: Linear<br>Control Theory       Col       Evaluate Poynting vector and apply Poynting vector<br>theorem in problems.       65       68         CO2       Evaluate Poynting vector and apply Poynting vector<br>theorem in problems.       65       68         CO3       Examine the phenomena of wave propagation in<br>different media and describe the phenomena of<br>reflection of such waves in plane boundaries<br>between homogeneous media.       72         BELL504: Linear<br>Control Theory       Co1       Calculate the transfer function of feedback control<br>system using Block diagram and Signal flow graph<br>method       85         CO2       Evaluate the time domain response of first &<br>Second order system for different standard inputs.       60       84         CO4       Calculate steady state error for type 0,1,& 2 system.       60       62         CO5       Determine the (absolute) stability of a closed-loop<br>control system using various methods.       60       83         BELL505: Digital<br>Communication       CO1       Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.       60       93         CO2       Design the concepts of Digital Communication<br>System.       CO3       Apply the digital modulation techniques in       60       53 <td colspan="2"></td> <td></td> <td></td> <td>05</td> <td>71</td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                  |        |                                                       | 05        | 71 |
| BELL 504: Linear<br>Control Theory       CO1       Calculate the time domain response of first &<br>Second order system for different standard inputs.       60       86         BELL 504: Linear<br>Control Theory       CO1       Calculate the transfer function of feedback control<br>system using Block diagram and Signal flow graph<br>method.       60       86         CO2       Evaluate the time domain response of first &<br>Control Theory       CO1       Calculate the transfer function of feedback control<br>system using Block diagram and Signal flow graph<br>method.       60       86         CO3       Distinguish various controllers.       60       84         CO4       Calculate steady state error for type 0,1,& 2 system.       60       83         BELL505: Digital<br>Communication       CO1       Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.       60       83         CO2       CO3       Apply the digital modulation techniques in       60       53                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                  | CO3    | Use boundary conditions for electric and magnetic     | 65        | 85 |
| Image: space of the system set of t                |  |                  |        | fields at the interface of two different media.       |           | 05 |
| Image: constraint of the second sec |  |                  | CO4    | Analyze Maxwell equations in different forms          | 65        |    |
| CO5Evaluate Poynting vector and apply Poynting vector<br>theorem in problems.6568CO6Examine the phenomena of wave propagation in<br>different media and describe the phenomena of<br>reflection of such waves in plane boundaries<br>between homogeneous media.6572BELL504: Linear<br>Control TheoryCO1Calculate the transfer function of feedback control<br>system using Block diagram and Signal flow graph<br>method.6085CO2Evaluate the time domain response of first &<br>Second order system for different standard inputs.6086CO3Distinguish various controllers.6084CO4Calculate steady state error for type 0,1,& 2 system.6062CO5Determine the (absolute) stability of a closed-loop<br>control system using various methods.6083BELL505: Digital<br>CommunicationCO1Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.6093CO2Design the concepts of Digital Communication<br>System.6053                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                  |        | (differential and integral) and apply them to diverse |           | 72 |
| BELL504: Linear<br>Control Theory       CO1       Calculate the transfer function of feedback control<br>system using Block diagram and Signal flow graph<br>method.       60       85         CO2       Evaluate the time domain response of first &<br>Second order system for different standard inputs.       60       86         CO3       Distinguish various controllers.       60       84         CO4       Calculate the time domain response of first &<br>Second order system for different standard inputs.       60       84         CO3       Distinguish various controllers.       60       84         CO4       Calculate stady state error for type 0,1,& 2 system.       60       60         R       CO6       Solve control system equations in state variable<br>form.       60       83         BELL505: Digital<br>Communication       CO1       Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.       60       93         CO2       Describe the various aspects of Digital Communication<br>System.       60       53                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                  |        | engineering problems.                                 |           |    |
| Interview of the orem in problems.       Coil       Examine the phenomena of wave propagation in different media and describe the phenomena of reflection of such waves in plane boundaries between homogeneous media.       72         BELL504: Linear Control Theory       COI       Calculate the transfer function of feedback control system using Block diagram and Signal flow graph method.       60       85         CO2       Evaluate the time domain response of first & Second order system for different standard inputs.       60       84         CO3       Distinguish various controllers.       60       84         CO4       Calculate steady state error for type 0,1,& 2 system.       60       60         CO5       Determine the (absolute) stability of a closed-loop control system using various methods.       60       83         BELL505: Digital Communication       CO1       Describe the various aspects of sampling theorem viz. Aliasing, signal distortion.       60       53         CO3       Apply the digital modulation techniques in       60       53                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                  | CO5    |                                                       | 65        | 68 |
| BELL504: Linear<br>Control TheoryCO1<br>Calculate the transfer function of feedback control<br>system using Block diagram and Signal flow graph<br>method72C02Evaluate the transfer function of feedback control<br>system using Block diagram and Signal flow graph<br>method6085C03Evaluate the time domain response of first &<br>Second order system for different standard inputs.6084C04Calculate steady state error for type 0,1,& 2 system.6062C05Determine the (absolute) stability of a closed-loop<br>control system using various methods.6083BELL505: Digital<br>CommunicationC01Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.6093C02Design the concepts of Digital Communication<br>System.C015353C03Apply the digital modulation techniques in6070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                  |        |                                                       |           | 08 |
| BELL504: Linear<br>Control Theory       CO1       Calculate the transfer function of feedback control<br>system using Block diagram and Signal flow graph<br>method       60       85         CO2       Evaluate the time domain response of first &<br>Second order system for different standard inputs.       60       86         CO3       Distinguish various controllers.       60       84         CO4       Calculate steady state error for type 0,1,& 2 system.       60       62         CO5       Determine the (absolute) stability of a closed-loop<br>control system using various methods.       60       83         BELL505: Digital<br>Communication       CO1       Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.       60       93         CO2       Design the concepts of Digital Communication<br>System.       60       53                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                  | CO6    | 1 10                                                  | 65        |    |
| BELL504: Linear<br>Control Theory       CO1       Calculate the transfer function of feedback control<br>system using Block diagram and Signal flow graph<br>method       60       85         CO2       Evaluate the time domain response of first &<br>Second order system for different standard inputs.       60       86         CO3       Distinguish various controllers.       60       84         CO4       Calculate steady state error for type 0,1,& 2 system.       60       62         CO5       Determine the (absolute) stability of a closed-loop<br>control system using various methods.       60       83         BELL505: Digital<br>Communication       CO1       Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.       60       93         CO2       Design the concepts of Digital Communication<br>System.       CO3       Apply the digital modulation techniques in       60       74                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                  |        | -                                                     |           | 72 |
| BELL504: Linear<br>Control TheoryCO1<br>Calculate the transfer function of feedback control<br>system using Block diagram and Signal flow graph<br>method.6085CO2Evaluate the time domain response of first &<br>Second order system for different standard inputs.6086CO3Distinguish various controllers.6084CO4Calculate steady state error for type 0,1,& 2 system.6062CO5Determine the (absolute) stability of a closed-loop<br>control system using various methods.6083BELL505: Digital<br>CommunicationCO1Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.6093CO2Design the concepts of Digital Communication<br>System.6053CO3Apply the digital modulation techniques in6070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                  |        | -                                                     |           | 12 |
| Control Theorysystem using Block diagram and Signal flow graph<br>method85CO2Evaluate the time domain response of first &<br>Second order system for different standard inputs.6086CO3Distinguish various controllers.6084CO4Calculate steady state error for type 0,1,& 2 system.6062CO5Determine the (absolute) stability of a closed-loop<br>control system using various methods.6083BELL505: Digital<br>CommunicationCO1Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.6093CO2Design the concepts of Digital Communication<br>System.CO25353CO3Apply the digital modulation techniques in6070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                  |        |                                                       |           |    |
| methodmethodmethodCO2Evaluate the time domain response of first &<br>Second order system for different standard inputs.6086CO3Distinguish various controllers.6084CO4Calculate steady state error for type 0,1,& 2 system.6062CO5Determine the (absolute) stability of a closed-loop<br>control system using various methods.6074CO6Solve control system equations in state variable<br>form.6083BELL505: Digital<br>CommunicationCO1Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.6093CO2Design the concepts of Digital Communication<br>System.605353CO3Apply the digital modulation techniques in6070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                  | CO1    |                                                       | 60        |    |
| CO2Evaluate the time domain response of first &<br>Second order system for different standard inputs.6086CO3Distinguish various controllers.6084CO4Calculate steady state error for type 0,1,& 2 system.6062CO5Determine the (absolute) stability of a closed-loop<br>control system using various methods.6074CO6Solve control system equations in state variable<br>form.6083BELL505: Digital<br>CommunicationCO1Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.6093CO2Design the concepts of Digital Communication<br>System.CO3Apply the digital modulation techniques in6070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | Control Theory   |        |                                                       |           | 85 |
| Second order system for different standard inputs.86CO3Distinguish various controllers.60CO4Calculate steady state error for type 0,1,& 2 system.60CO5Determine the (absolute) stability of a closed-loop<br>control system using various methods.60CO6Solve control system equations in state variable<br>form.60BELL505: Digital<br>CommunicationCO1Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.60CO2Design the concepts of Digital<br>System.6053CO3Apply the digital modulation techniques in6070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                  |        |                                                       |           |    |
| Second order system for different standard inputs.Second order system for different standard inputs.CO3Distinguish various controllers.6084CO4Calculate steady state error for type 0,1,& 2 system.6062CO5Determine the (absolute) stability of a closed-loop<br>control system using various methods.6074CO6Solve control system equations in state variable<br>form.6083BELL505: Digital<br>CommunicationCO1Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.6093CO2Design the concepts of Digital Communication<br>System.CO3Apply the digital modulation techniques in6070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |                  | CO2    | · · · · · · · · · · · · · · · · · · ·                 | 60        | 86 |
| CO4Calculate steady state error for type 0,1,& 2 system.6062CO5Determine the (absolute) stability of a closed-loop<br>control system using various methods.6074CO6Solve control system equations in state variable<br>form.6083BELL505: Digital<br>CommunicationCO1Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.6093CO2Design the concepts of Digital Communication<br>System.CO3Apply the digital modulation techniques in6070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                  |        |                                                       |           | 00 |
| CO5Determine the (absolute) stability of a closed-loop<br>control system using various methods.6074CO6Solve control system equations in state variable<br>form.6083BELL505: Digital<br>CommunicationCO1Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.6093CO2Design the concepts of Digital Communication<br>System.CO3Apply the digital modulation techniques in6070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                  | CO3    | Distinguish various controllers.                      | 60        | 84 |
| Image: Control system using various methods.74CO6Solve control system equations in state variable<br>form.6083BELL505: Digital<br>CommunicationCO1Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.6093CO2Design the concepts of Digital Communication<br>System.CO2Design the concepts of Digital Communication<br>System.6053                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                  | CO4    | Calculate steady state error for type 0,1,& 2 system. | 60        | 62 |
| Image: Control system using various methods.74CO6Solve control system equations in state variable<br>form.6083BELL505: Digital<br>CommunicationCO1Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.6093CO2Design the concepts of Digital Communication<br>System.CO2Design the concepts of Digital Communication<br>System.6053                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                  | CO5    | Determine the (absolute) stability of a closed-loop   | 60        | 74 |
| BELL505: Digital<br>CommunicationCO1Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.6093CO2Design the concepts of Digital Communication<br>System.CO2Design the concepts of Digital Communication<br>System.6053                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                  |        |                                                       |           | /4 |
| BELL505: Digital<br>CommunicationCO1Describe the various aspects of sampling theorem<br>viz. Aliasing, signal distortion.6093CO2Design the concepts of Digital Communication<br>System.CO2Design the concepts of Digital Communication<br>System.6053                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                  | C06    | Solve control system equations in state variable      | 60        | 02 |
| Communicationviz. Aliasing, signal distortion.93CO2Design the concepts of Digital Communication<br>System.6053CO3Apply the digital modulation techniques in<br>606070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                  |        | form.                                                 |           | 00 |
| Communicationviz. Aliasing, signal distortion.60CO2Design the concepts of Digital Communication<br>System.60CO3Apply the digital modulation techniques in<br>6060                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | BELL505: Digital | CO1    | Describe the various aspects of sampling theorem      | 60        | 02 |
| System.53CO3Apply the digital modulation techniques in6070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | Communication    |        | viz. Aliasing, signal distortion.                     |           | 95 |
| System.System.CO3Apply the digital modulation techniques in6070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                  | CO2    | Design the concepts of Digital Communication          | 60        | 52 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                  |        | System.                                               |           | 33 |
| communication systems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                  | CO3    | Apply the digital modulation techniques in            | 60        | 70 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                  |        | communication systems.                                |           | 70 |

|                                     |                              | CO4 | Analyze the performance of digital communication system in terms of error rate and spectral efficiency.                                     | 60 | 58 |
|-------------------------------------|------------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------|----|----|
|                                     |                              | CO5 | Design the concepts of matched filter and correlator detector.                                                                              | 60 | 33 |
|                                     |                              | CO6 | Solve problems of efficient source coding and channel coding in communications systems.                                                     | 60 | 47 |
| Semester - 7                        | ELL-701:<br>Advanced Control | CO1 | Describe quantitatively the basics of digital control system.                                                                               | 60 | 91 |
|                                     | System                       | CO2 | Examine the stability analysis of closed loop system<br>in Z plane.                                                                         | 60 | 92 |
|                                     |                              | CO3 | Demonstrate an understanding of nonlinear control system                                                                                    | 60 | 92 |
|                                     |                              | CO4 | Examine the stability of control system using Root Locus technique.                                                                         | 60 | 69 |
|                                     |                              | CO5 | Represent any system by state space model                                                                                                   | 60 | 73 |
|                                     |                              | CO6 | Design PID controller to meet system performance.                                                                                           | 60 | 72 |
| ELL702:<br>Microwave<br>Engineering |                              | CO1 | Analyze modes and dominant mode in rectangular waveguide and cylindrical waveguide.                                                         | 60 | 79 |
|                                     |                              | CO2 | Calculate S-Matrix parameters for different port networks, and Microwave resonator.                                                         | 60 | 74 |
|                                     |                              | CO3 | Explain Microwave Network representations, H-<br>plane tee, Magic tee, directional coupler.                                                 | 60 | 56 |
|                                     |                              | CO4 | Design isolator, basic microwave amplifiers,<br>particularly klystrons, magnetron, and RF filters,<br>basic RF oscillator and mixer models. | 60 | 48 |
|                                     |                              | CO5 | Enumerate and demonstrate application of different diodes in microwave circuits.                                                            | 60 | 46 |
|                                     |                              | CO6 | Analyze different types of transmission lines and<br>measurement parameters related to microwave<br>circuits.                               | 60 | 35 |
|                                     | ELL703: Cellular<br>Mobile   | CO1 | Build the concepts of wireless communication and cellular systems.                                                                          | 60 | 42 |
|                                     | Communication                | CO2 | Analyze mobile radio propagation models and parameters related to it.                                                                       | 60 | 47 |

|                    | 1        |                                                                                                                                 |     |     |
|--------------------|----------|---------------------------------------------------------------------------------------------------------------------------------|-----|-----|
|                    | CO3      | Describe about cell splitting, sectoring, cell-site<br>antenna and frequency management for cellular                            | 60  | 49  |
|                    | <u> </u> | system.                                                                                                                         | (0) | 0.4 |
|                    | CO4      |                                                                                                                                 | 60  | 84  |
|                    | CO5      | Analyze GSM system architecture and its frame structure.                                                                        | 60  | 75  |
|                    | CO6      | Describe spread spectrum multiple access and CDMA.                                                                              | 60  | 34  |
| ELL704: VLSI       | CO1      | Design different VLSI Circuits.                                                                                                 | 60  | 80  |
| Design             | CO2      | Describe MOSFET fundamentals its manufacturing and fabrication process.                                                         | 60  | 59  |
|                    | CO3      | Design inverter, parallel and series equivalent circuits and VLSI interconnects.                                                | 60  | 79  |
|                    | CO4      | Illustrate circuit diagram, stick diagrams and layouts design rules for MOS.                                                    | 60  | 73  |
|                    | CO5      | Describe MOS transistor characteristics and its various Performance parameters.                                                 | 60  | 55  |
|                    | CO6      | Design CMOS subsystems and Semiconductors memories- SRAM DRAM SRAM SPICE models.                                                | 60  | 44  |
| BETL/ELL710        | CO1      | Describe the CMOS logic circuits.                                                                                               | 60  | 94  |
| /7445              | CO2      | Design different MOS Models.                                                                                                    | 60  | 60  |
| CMOS<br>TECHNOLOGY | CO3      | Classify the CMOS Process technology and layout design rules for CMOS circuits.                                                 | 60  | 85  |
|                    | CO4      | Describe MOS transistor characteristics and its various performance, Parameters that effect the operation the of CMOS circuits. | 60  | 87  |
|                    | CO5      | Examine the Semiconductors Memories.                                                                                            | 60  | 87  |
|                    | CO6      | Design problems related to programmable logic array.                                                                            | 60  | 89  |

# MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute, Affiliated to R.G.P.V. Bhopal)

# Department of Electronics Engineering

List of subjects and their CO whose target level is not achieved (Session July-December 2018)

| Semester | Subject Name                                                                          | CO attainment<br>(TARGET NOT<br>ACHIEVED) | Action Taken                                                            |
|----------|---------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------------------------------------|
|          | *140302/*200302<br>Electronics – I<br>*140303/*200303<br>Digital Circuits And Systems | CO4, CO5, CO6<br>CO6                      | • In house workshop<br>for CO revision and<br>question paper<br>setting |
| III      | *140304/*200304<br>Network Theory                                                     | CO4, CO5, CO6                             | <ul> <li>Additional Classes</li> <li>More tutorials</li> </ul>          |
|          | *140305/*200305<br>Signals And Systems                                                | CO5,CO6                                   | <ul> <li>Solutions of previous year</li> </ul>                          |
| V        | BELL505: Digital<br>Communication                                                     | CO2, CO4, CO4, CO6                        | question papers                                                         |
| VII      | ELL702: Microwave Engineering<br>ELL703: Cellular Mobile<br>Communication             | CO3, CO4, CO5, CO6<br>CO1, CO2, CO3, CO6  | • Additional classes by expert                                          |
|          | ELL704: VLSI Design                                                                   | CO2, CO5, CO6                             |                                                                         |