Teaching Plan

Name of the Faculty : Dr. Neetu Singh

Name of the Course : B. Tech. Electronics

Semester : VI Sec (if any) : N.A.

Title of the Paper : Control Systems

Month	Topics Covered	References
January	Introduction of open loop and closed loop control systems, mathematical modeling of physical systems (Electrical, Mechanical and Thermal), derivation of transfer function, Armature controlled and field controlled DC servomotors, AC servomotors, block diagram representation & signal flow graph, Reduction Technique, Mason's Gain Formula. Effect of feedback on control systems, Basic Control Actions: Proportional, integral and Derivative controls	• Chapter 1,2,3,4- I. J. Nagrath & M. Gopal, Control System Engineering, New Age International, 2000 • Chapter 1,3- K. Ogata, Modern Control Engineering, PHI 2002 • Chapter 1,3,4- B. C. Kuo , "Automatic control system", Prentice Hall of India, 2000
February	**Time – Domain Analysis:-**Time domain performance criteria, transient response of first, second & higher order systems, steady state errors and static error constants, performance indices, response with P, PI and PID Controllers. **Concept of Stability:** Asymptotic stability and conditional stability, Routh – Hurwitz criterion, relative stability analysis, Root Locus plots and their applications. **Practical:- NA** **Assignment:15 Feb, Monday**	• Chapter 5,6,7 - I. J. Nagrath& M. Gopal, Control System Engineering, New Age International, 2000 • Chapter 5,6,7 - K. Ogata, Modern Control Engineering, PHI 2002 • Chapter 6,7,8,10 - B. C. Kuo , "Automatic control system", Prentice Hall of India, 2000
March	**Frequency Domain Analysis:** Correlation between time and frequency response, Polar and inverse polar plots, frequency domain specifications, Logarithmic plots (Bode Plots), gain and phase margins, Nyquist stability criterion, relative stability using nyquist criterion, constant M & N circles. **Practical:- NA** **Test -I: 7 March, Monday (Tentative)**	• Chapter 8,9 - I. J. Nagrath& M. Gopal, Control System Engineering, New Age International, 2000 • Chapter 8 - K. Ogata, Modern Control Engineering, PHI 2002 • Chapter 9 - B. C. Kuo , "Automatic control system", Prentice Hall of India, 2000
April	**Compensation Techniques:** Concept of compensation, Lag, Lead and Lag-Lead networks **State Space Analysis:** Definitions of state, state variables, state space, representation of systems, Solution of time invariant, homogeneous state equation, state transition matrix and its properties. **Test-II : 28 March, Monday(Tentative)**	• Chapter 10,12 - I. J. Nagrath& M. Gopal, Control System Engineering, New Age International, 2000 • Chapter 9,11 - K. Ogata, Modern Control Engineering, PHI 2002 • Chapter 5,10 - B. C. Kuo , "Automatic control system", Prentice Hall of India, 2000

Teaching Plan Jan'16

Name of the Faculty: Mrs.Jyoti Bansal

Name of the Course:B.Sc. (H) Electronics

Semester : VI semester **Sec (if any)** : NA

Title of the Paper : Digital Signal Processing

Month	Topics Covered	References
January	**Theory:-** **Discrete Time systems:** Discrete sequences, linear coefficient difference equation, Representation of DTS, LSI Systems. Stability and causality, frequency domain representations and Fourier transform of DT sequences. **Practical:** . Generation in MATLAB of unit sample sequence, unit step, ramp function, discrete time sequence, real sinusoidal sequence. . Generate and plot sequences over an interval.	• A.V. Oppenheim and Schafer, Discrete Time Signal Processing, Prentice Hall, 1989. • John G. Proakis and D.G. Manolakis, Digital Signal Processing: Principles, Algorithms And Applications, Prentice Hall, 1997. • A.V. Oppenheim and Schafer, Discrete Time Signal Processing, Prentice Hall, 1989. • John G. Proakis and D.G. Manolakis, Digital Signal Processing: Principles, Algorithms And Applications, Prentice Hall, 1997.
February	**Theory:-** **Z-Transform:** Definition and properties, Inverse Z Transform and stability. Parsevals Theorem and applications. Function signal flow graph, its use in representation and analysis of Discrete Time Systems. Techniques of representations. Matrix generation and solution for DTS evaluations. **Practical:-** . Guven x[n], write program in MATLAB to find X[z]. . Fourier Transform, Discrete Fourier Transform and Fast Fourier Transform **Test -I: 26th February, Friday (Tentative)** **Theory:-**	• A.V. Oppenheim and Schafer, Discrete Time Signal Processing, Prentice Hall, 1989. • John G. Proakis and D.G. Manolakis, Digital Signal Processing: Principles, Algorithms And Applications, Prentice Hall, 1997.

March April	**Discrete Fourier Transform:** DFT assumptions and Inverse DFT. Matrix relations, relationship with FT and its inverse, circular convolution, DFT theorems, DCT. Computation of DFT. FFT Algorithms and processing gain, Discrimination ,interpolation and extrapolation. Gibbs phenomena. FFT of real functions interleaving and resolution improvement. Word length effects. **Practical:-** . Design of a Butterworth analog filter for low pass and high pass. **<u>Presentation: 1st March onwards ,Monday</u>** **Theory:-** **Digital Filters:** Analog filter review. System function for IIR and FIR filters, network representation. Canonical and decomposition networks. IIR filter realization methods and their limitations. FIR filter realization techniques. Discrete correlation and convolution; Properties and limitations. **Practical:-** . Design of digital filters. **<u>Test-II : 10th April, Monday(Tentative)</u>** **NOTE**: Remaining topics, if any &revision.	• A.V. Oppenheim and Schafer, Discrete Time Signal Processing, Prentice Hall, 1989. • John G. Proakis and D.G. Manolakis, Digital Signal Processing: Principles, Algorithms And Applications, Prentice Hall, 1997.

Teaching Plan Jan'16

Name of the Faculty: Mrs.Jyoti Bansal

Name of the Course:B.Sc. (H) Electronics

Semester : VI semester **Sec (if any)** : NA

Title of the Paper : Engineering Mathematics-II

Month	Topics Covered	References
January	**Theory:-** Series Solutions of Differential Equations and Special Functions: Power Series Method, Legendre Polynomials, Frobenius Method, Bessel's equations and Bessel's functions of first and second kind. **Practical:** . Solve the linear partial differential equation of first order. . Solve the non-linear partial differential equation of first order. **Test -I: 19th January, Tuesday (Tentative)**	• E. Kreyszig, Advanced Engineering Mathematics, Wiley India (2008) • B. V. Ramana, Higher Engineering Mathematics, Tata Mc-Graw Hill Publishing Company Limited (2007) • R. K. Jain, and S. R. K. Iyengar, Advanced Engineering Mathematics, Narosa Publishing House (2007)
February	**Theory:-** **Fourier series :**Functions of any period, even and odd Functions, half range expansions, Forced Oscillations, Complex Fourier Series Fourier Integral, Fourier Sine and Cosine Transforms. , Fourier Transforms ,Discrete and Fast Fourier Transforms. **Practical:-** . Solve two dimensional wave equations. **Assignment: 25th February,Thursday (Tentative)**	• E. Kreyszig, Advanced Engineering Mathematics, Wiley India (2008) • B. V. Ramana, Higher Engineering Mathematics, Tata Mc-Graw Hill Publishing Company Limited (2007) • R. K. Jain, and S. R. K. Iyengar, Advanced Engineering Mathematics, Narosa Publishing House (2007) • E. Kreyszig, Advanced Engineering Mathematics, Wiley India (2008) • B. V. Ramana, Higher Engineering Mathematics, Tata Mc-Graw Hill Publishing Company Limited (2007) • R. K. Jain, and S. R. K. Iyengar, Advanced Engineering Mathematics, Narosa Publishing House

March	**Theory:-** **Partial Differential Equations:** Formation of Partial Differential Equation, Partial Differential Equation of First Order, Linear Equations of First Order, Non-linear Partial Differential Equations of First Order, Method of Separation of Variables, Classification of Partial Differential Equations of Second Order. **Practical:-** . Solve two dimensional heat equations.	(2007) • E. Kreyszig, Advanced Engineering Mathematics, Wiley India (2008) • B. V. Ramana, Higher Engineering Mathematics, Tata Mc-Graw Hill Publishing Company Limited (2007) R. K. Jain, and S. R. K. Iyengar, Advanced Engineering Mathematics, Narosa Publishing House (2007)
April	**Theory:-** **Partial Differential Equations:** Modeling a Vibrating string and the Wave Equation, Separation of Variables and Use of Fourier series. **Practical:-** . Solve Bessel's function of first order.. **Test-II : 11th April, Monday(Tentative)** **NOTE**:Remaining topics, if any &revision.	

Teaching Plan Jan'16

Name of the Faculty: Dr. Monika Bhattacharya

Name of the Course: B.Tech Electronics

Semester : VI semester **Sec (if any)**: NA

Title of the Paper : Embedded Systems

Month	Topics Covered	References
January	**Theory:-** • Overview of Embedded Systems, Features, Requirements and Applications • Recent Trends in the Embedded System Design, Common architectures for the Embedded System Design, Embedded • Software design issues. Introduction to microcontrollers, Overview of Harvard architecture and • Von Neumann architecture, RISC and CISC microcontrollers • Introduction to AVR RISC Microcontrollers, Architecture overview, status **Practical:** Programming of AVR Microcontroller in Assembly and C using AVR Studio IDE • To calculate simple mathematical expressions such as N!, 2^N, M^N, etc. • To generate first N terms of infinite series such as Fibonacci series, A.P. series, G.P. series, etc. To sort data in an array.	• Chapter 1, 2 &3 AVR Microcontroller and Embedded Systems: Using Assembly and C by Muhammad Ali Mazidi, Sarmad Naimi, Sepehr Naimi, PHI • Chapter 1-2 Programming and Customizing the AVR Microcontroller by D V Gadre, McGraw-Hill
February	**Theory:-** Status register, general purpose register file, memories, Instruction set, Data Transfer Instructions, Arithmetic and Logic Instructions, Branch Instructions, Bit and Bit-test Instructions, MCU Control Instructions. Simple programs in Assembly Language / C Language **Ist Internal Assessment Test** (February 22, Monday) (tentative) **Practical:** AVR I/O port programming	• Chapter 4 5 &6 AVR Microcontroller and Embedded Systems: Using Assembly and C by Muhammad Ali Mazidi, Sarmad Naimi, Sepehr Naimi, PHI • Chapter 3 &4 Programming and Customizing the AVR Microcontroller by D V Gadre, McGraw-Hill

<table>
<tr>
<td>March

April</td>
<td>Theory:
Introduction to System Clock, Reset sources,
Introduction to interrupts, External interrupts,
I/O Ports, 8-bit and 16-bit Timers
Introduction to different modes, Input Capture and Compare Match.
Practicals:-
To interface a simple keyboard and LED with microcontroller.
To display key status on LED using various algorithms such as (i) LED should be ON till the corresponding key is pressed. (ii) LED should be ON when the corresponding key is pressed once. LED should be switched OFF when the key is pressed next.
To display different patterns on LEDs using Timers.
To interface an LCD with microcontroller.
Presentations: March 9-11,

Internal Assessment Test II : March 28, Monday (Tentative)

Theory:
Analog Comparator, Analog-to-Digital Converter, Serial Peripheral Interface (SPI), The
Universal Synchronous and Asynchronous serial Receiver and Transmitter (USART), Two Wire Interface (TWI) / I^2C bus
Practicals:
To measure analog voltage using ADC and display its value on LCD.
To measure the frequency of an AC signal.
To control speed of an DC motor.
To control speed of a Stepper motor</td>
<td>Chapter 8,10 &11
AVR Microcontroller and Embedded Systems: Using Assembly and C by Muhammad Ali Mazidi, Sarmad Naimi, Sepehr Naimi, PHI
Chapter 5
Programming and Customizing the AVR Microcontroller by D V Gadre, McGraw-Hill
Chapter-12
AVR Microcontroller and Embedded Systems: Using Assembly and C by Muhammad Ali Mazidi, Sarmad Naimi, Sepehr Naimi, PHI
Chapter- 6 & 7Programming and Customizing the AVR Microcontroller by D V Gadre, McGraw-Hill</td>
</tr>
</table>

Teaching Plan

Name of the Faculty : Dr. Neetu Singh

Name of the Course : B.Tech. (Electronics)

Semester : VI Sec (if any) : N.A.

Title of the Paper : Engineering Mathematics -II

Month	Topics Covered	References
January	Ordinary Differential Equations: First Order Ordinary Differential Equations, Basic Concepts. Linear Differential Equations of Second Order :Homogeneous Linear Ordinary Differential Equations of second order, :Homogeneous Linear Ordinary Differential Equations with constant coefficients.	Kreyszig, Advanced Engineering Mathematics.
February	Modelling: Free Oscillations, Euler-cauchy Equations, Existence and Uniqueness of solutions, Non-Homogeneous ODEs, Modeling: Forced Oscillations. Higher order homogeneous differential equations. **Assignment:15 Feb, Monday**	Kreyszig, Advanced Engineering Mathematics.
March	Modelling Separable Ordinary Differential Equations, Modelling, Exact Ordinary Differential Equations. **Test:1 Mar, Tuesday**	Kreyszig, Advanced Engineering Mathematics.
April	Linear Ordinary Differential Equations. **NOTE**:Remaining topics, if any &revision.	Kreyszig, Advanced Engineering Mathematics.