**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)**

Scheme of Teaching & Examination

**M.E. Electronics & Telecommunication (Communication)**

II Semester

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Board of Study</th>
<th>Subject Code</th>
<th>Subject</th>
<th>Periods per Week</th>
<th>Scheme of Examination</th>
<th>Credit L+(T+P)/2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>L</td>
<td>T</td>
<td>P</td>
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<tr>
<td>1</td>
<td>Electronics &amp; Telecom</td>
<td>551211 (28)</td>
<td>Secure Communication</td>
<td>3</td>
<td>1</td>
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<td>2</td>
<td>Electronics &amp; Telecom</td>
<td>551212 (28)</td>
<td>Advanced Mobile Communication</td>
<td>3</td>
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<tr>
<td>3</td>
<td>Electronics &amp; Telecom</td>
<td>551213 (28)</td>
<td>Digital Communication Receivers</td>
<td>3</td>
<td>1</td>
<td>-</td>
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<td>4</td>
<td>Electronics &amp; Telecom</td>
<td>551214 (28)</td>
<td>Embedded Technology in communication System</td>
<td>3</td>
<td>1</td>
<td>-</td>
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<td>5</td>
<td>Refer Table –II</td>
<td>Elective-II</td>
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<td>3</td>
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<td>6</td>
<td>Electronics &amp; Telecom</td>
<td>551221 (28)</td>
<td>Embedded Technology in Communication Systems Lab</td>
<td>-</td>
<td>-</td>
<td>3</td>
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<td>7</td>
<td>Electronics &amp; Telecom</td>
<td>551222 (28)</td>
<td>Signal Processing Lab</td>
<td>-</td>
<td>-</td>
<td>3</td>
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**Total**

|        | 15 | 5  | 6  | 650 | 100 | 250 | 1000 | 24 |

L- Lecture  
T- Tutorial  
P- Practical ,  
ESE- End Semester Exam  
CT- Class Test  
TA- Teacher's Assessment

**Table-II**

**ELECTIVE II**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Board of Study</th>
<th>Subject Code</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Electronics &amp; Telecom</td>
<td>551231 (28)</td>
<td>Advanced Digital Signal Processing &amp; Applications</td>
</tr>
<tr>
<td>2</td>
<td>Electronics &amp; Telecom</td>
<td>551232 (28)</td>
<td>Microwave Integrated Circuits</td>
</tr>
<tr>
<td>3</td>
<td>Electronics &amp; Telecom</td>
<td>551233 (28)</td>
<td>Optical Communication System</td>
</tr>
</tbody>
</table>

**Note (1)** – 1/4th of total strength of students subject to minimum of twenty students is required to offer an elective in the college in a particular academic session.

**Note (2)** – Choice of elective course once made for an examination cannot be changed in future examinations.
UNIT - I
CONVENTIONAL ENCRYPTION: Introduction, Conventional Encryption model, Stenography, Data Encryption, Standard block cipher, Encryption algorithms, confidentially key distribution.

UNIT - II
PUBLIC KEY ENCRYPTION AND HASHING: Principles of public key cryptosystems, RSA algorithm, Diffie-Hellman key Exchange, Elliptic curve cryptology, message authentication and Hash function, Hash and Mac algorithms, Digital signatures.

UNIT - III

UNIT - IV
WEB SECURITY: Web security requirement, secure sockets layer, transport layer security, secure electronic transaction, dual signature.

UNIT - V
SYSTEM SECURITY: Intruders, Viruses, Worms, Firewall design, Trusted systems, antivirus techniques, digital immune systems

Textbooks:

Reference Books:
a. Cryptography & Network Security W.stallings PHI
b. Applied Cryptography Schneier, Bruce John Wiley
Unit 1
Introduction to wireless mobile communications:
History & Evolution Of Mobile Radio Systems. Types Of Mobile Wireless Services / Systems-

Unit 2
Cellular Concept And System Design Fundamentals:
Cellular Concept And Frequency Reuse, Multiple Schemes, Channel Assignment And Handoff,
Interference And System Capacity, Trunking And Erlang Capacity Calculations.

Unit 3
Mobile Radio Propagation
Fading And Base Band Impulse Respond Models, Parameters Of Mobile Multipath Channels,
Antenna Systems In Mobile Radio.

Unit 4
Modulation And Signal Processing:
Analog And Digital Modulation Techniques- Performance Of Various Modulation Techniques,
Spectral Efficiency, Error Rate, Power Amplification, Equalizing Rake Receiver Concepts,
Diversity And Space Time Processing, Speech Coding Channel Coding.

Unit 5
System Example and Design Issues:
Multiple access techniques –FDMA, TDMA and CDMA Systems, Operational Systems, Wireless

Text Books

Reference Books
W.CY. Lee, “ Mobile Communications Engineering: Theory and appliocations, 2nd edition” MC-
Schiller “ Mobile communications” Peason Education Asia Ltd. 2000.
UNIT - I
Detection of Binary Signal in Gaussian Noise:

UNIT - II
Coherent and Noncoherent Detection:
Coherent Detection: Coherent Detection of PSK, Sampled Matched Filter, Coherent Detection of Multiphase Shift Keying, Coherent Detection of FSK.
Noncoherent Detection: Detection of Differential PSK, Binary Differential PSK example, Noncoherent Detection of FSK, Required Tone Spacing for Noncoherent Orthogonal FSK.

UNIT - III
Waveform Coding:
Waveform Coding and Structured Sequences: Antipodal and Orthogonal Signals, M-ary Signaling, Waveform Coding. Error-Detecting and Correcting Capability: Weight and Distance of Binary vectors, Minimum Distance of a Linear code, Error Detection and Correction, Convolutional Encoding, Reed-Solomon Codes.

UNIT - IV
Channel Coding:

UNIT - V
Microwave Receiver:

Text Books:

Reference Books:
2. Digital Communication Technique, Signal Design & Detection By Simon, Marvin K, Hinedi,Sami M & Lindsey, William C, PHI.
Semester: M. E. II  
Subject: Embedded Technology in Communication System  
Code: 551214 (28)

Total Theory Periods: 40  
Total Tutorial Periods: 12

Minimum number of class test to be conducted: 02

UNIT - I
Microcontrollers: Brief review of the 8 bit microcontroller 8051 - Programming , CPU Block diagram, Memory Organization, SFR s ,Ports and Interfacing -Introduction to a 16 bit micro controller 80186 High Speed Input, High Speed Output, Interrupts, ADC, PWM, Timers, Watch Dog Timer, Serial Port, I/O Port

UNIT - II
Introduction to Embedded Systems: Characteristics of Embedded systems , Software embedded into a system . General ideas of Processor and Memory organization - Processor and memory selection , Interface to Memory and I/O devices - Devices and Buses - Device Drivers and Interrupt Servicing mechanisms

UNIT - III
Inter-process Communication and Synchronization of Processes , Tasks and Threads: Multiple Processes in an Application - Data sharing by multiple tasks and routines- Inter Process Communication

UNIT - IV

UNIT - V
Case Study: Study of VX works - Case Studies of programming with RTOS - Case study /design using ARM processor/PIC microcontroller

Text Books:

Reference Books:
1. Programming and Customizing the 8051 microcontroller, 1st Edition; by: Predko, Myke; McGraw Hill International  
6. Embedded Software Primer - Simon, David E.  
7. VxWorks Programmers guide  
8. VxWorks Reference manual
UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V

Text Books:

Reference Books:
UNIT - I
MICROSTRIPS LINES, DESIGN, ANALYSIS: Introduction, types of MICs and their technology, Propagating models, Analysis of MIC by conformal transformation, Numerical analysis, Hybrid mode analysis. losses in Microstrip, Introduction to slot line and coplanar wave guide

UNIT - II
COUPLED MICROSTRIP, DIRECTIONAL COUPLERS AND LUMPED ELEMENTS FOR MICS: Introduction to coupled Microstrip, Even and odd mode analysis, Directional couplers, branch line couplers, Design and Fabrication of Lumped elements for MICs, Comparison with distributed circuits

UNIT - III
NON-RECIPIRICAL COMPONENTS AND ACTIVE DEVICES FOR MICS: Ferromagnetic substrates and inserts, Microstrip circulators, Phase shifters, Microwave transistors, Parametric diodes and Amplifiers, PIN diodes, Transferred electron devices, IMPATT, BARITT, Avalanche diodes, Microwave transistors circuits.

UNIT - IV
MICROSTRIP CIRCUIT DESIGN AND APPLICATIONS: Introduction, Impedance transformers, Filters, High power circuits, Low power circuits, MICs in satellite and Radar.

UNIT - V
MMIC TECHNOLOGY: Fabrication process of MMIC, Hybrid MICs, Configuration, Dielectric substances, thick and thin film technology, Testing methods, Encapsulation and mounting of Devices.

References:
UNIT – I
Fiber Optic Guides: Light Wave Generation Systems, System Components, Optical Fibers, SI,GI-Fibers, Modes, Dispersion in Fibers, Limitations Due To Dispersion, Fiber Loss, Non-Linear Effects, Dispersion Shifted And Dispersion Flattened Fibers.

UNIT – II

UNIT – III
Light Wave System: Coherent, Homodyne And Heterodyne Keying Formats, BER In Synchronous-And Asynchronous- Receivers, Sensitivity Degradation, System Performance, Multichannel, WDM, Multiple Access Networks, WDM Components, TDM, Subcarrier And Code Division Multiplexing.

UNIT – IV

UNIT – V

Text Books:
2. Optical Fiber Communacation Keiser,gerd Mgh

Reference Books:
List of experiments to be performed:

(i) Create, compile and test a program to print a string a message on standard output device.
(ii) Create a program to print powers of 2 from $2^0$ to $2^{12}$.
(iii) Write a program that continuously reads Port A and provides output to port B.
(iv) Use External Hardware Interrupt to print a message to the standard output devices each time an interrupt occurs. Also print number of times interrupt occurs.
(v) Create a program that will turn on an LED when falling edge occurs on external interrupt 0 and turn it off when rising edge occurs on external interrupt 1.
(vi) Create a programme that will demonstrate how watchdog timer resets the processor if programme hangs up to infinite loop.
(vii) Create a programme that will read the data on all 8 bits of port B swap the nibble of data and send it to port A.
(viii) Create a simulated engine speed monitor that will light a LED if the motor speed drops below 200 rpm and another LED if motor speed exceed 500 rpm and light another LED if motor speed between 200 to 500 rpm.
(ix) Create a programme to output the ASCII character G every 50 msec via USART at 9600 baud rate.
(x) Write a microcontroller 8051 program to add two floating-point numbers.
(xi) Write a microcontroller 8051 program to multiply two floating-point numbers.
(xii) Write a microcontroller 8051 program that generates 2kHz square wave on pin P1.0, 2.5 kHz on pin P1.2 and 25 Hz on pin P1.3.
(xiii) Write a microcontroller 8051 program for counter 1 in mode 2 to count the pulses and display the state of the TL1 count on P2. Assume that the clock pulses are fed to pin T1.
(xiv) Write a microcontroller 8051 program to transfer word “COMMUNICATION” serially at 4800 baud and one stop bit, to the com port of PC continuously.
(xv) Write a microcontroller 8051 program to receive bytes of data serially, and put them in P1. Set the baud rate at 2400 baud, 8-bit data, and 1 stop bit. Assume crystal frequency to be 11.0592 MHz.

Recommended Books:
1. Embedded C Programming and the Microchip by PIC Barneet, Cox, O’cull Thomson publication
2. Embedded system by Raj Kamal TMH

List of Equipments/Machine Required:
1. MATLAB Software with Simulink
2. Emulation software with Cross C complier
CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)

M.E. Semester: II  Branch: Electronics & Telecommunication
Subject: Signal Processing Lab  Code: 551222 (28)
Total Practical Periods: 40
Total Marks in end Semester Exam - 75

List of Practical
1. To Generate the following waveforms
   a: Unitstep Sequence
   b: Ramp Sequence
   c: Exponcial Sequence
   d: Sine Sequence
   e: Sine Sequence
2. Program for linear convolution
3. Program of computing circular convolution.
4. Program for computing cross correlation of the given sequence.
5. Program for design of Butter worth LPF.
6. Program for the design of FIR, LP, HP, BP and BS Filters using Rectangular Window.
7. Program for estimating PSD of Two sinusoid Plus noise.
8. Program for Drawn Sampling a Sinusoidal sequence by a faster M.
9. Cancellation of echo produced on the telephone base band channel (Simulation).
11. Study of DSP Processor. (Texas Instrument)
12. To observe the effect of interpolation and decimation on the spectrum of a signal
    (DSP Works Software)
13. To Generate and amplitude modulation Signal and observe the presence of sideband in its
    spectrum. (DSP works software)
14. To Demonstrate Spectral Leakage.
15. Program for partial fraction decomposition of a rational transfer function.

Recommended Books:
1. DSP - S Salivaliaran, A Vallavraj, C, TATA MECGRAW HILL.
2. Digital Signal Processors - Architecture, Programming and Application- B Venkatramani, M Bhaskar, TATA MECGRAW HILL.
3. dsp - a Handson approach - Charles schuler, Mahesh chugani, TATA MECGRAW HILL

List of Equipments/Machine Required :
1. MATLAB Software with DSP Toolbox.
2. DSPworks Signal generation and Analysis Software.
3. TMS 320C6** service starter Kits with Code composer Studio.