# Scheme of Teaching and Examination

**M.Tech. (Information Technology)**

**Semester – I**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Board of Study</th>
<th>Subject Code</th>
<th>Subject Name</th>
<th>Periods</th>
<th>Scheme of Examination</th>
<th>Total Marks</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>533111 (33)</td>
<td>Distributed Operating System</td>
<td>3 1 -</td>
<td>ESE 100 CT 20 TA 20</td>
<td>140</td>
<td>4</td>
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<tr>
<td></td>
<td></td>
<td>533112 (33)</td>
<td>Information Technology Management</td>
<td>3 1 -</td>
<td>ESE 100 CT 20 TA 20</td>
<td>140</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>533113 (33)</td>
<td>Software Engineering &amp; TQM</td>
<td>3 1 -</td>
<td>ESE 100 CT 20 TA 20</td>
<td>140</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>533114 (33)</td>
<td>Advanced Image Technology</td>
<td>3 1 -</td>
<td>ESE 100 CT 20 TA 20</td>
<td>140</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>533121 (33)</td>
<td>Digital Image Processing Lab</td>
<td>- - 3</td>
<td>75 ESE 75 TA 150</td>
<td>2</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>533122 (33)</td>
<td>Software Testing Lab</td>
<td>- - 3</td>
<td>75 ESE 75 TA 150</td>
<td>2</td>
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**Total**: 15 L 5 T 6 ESE 100 CT 250 TA 1000 24

- **L**: Lecture,
- **T**: Tutorial,
- **P**: Practical,
- **ESE**: End Semester Examination,
- **CT**: Class Test,
- **TA**: Teacher’s Assessment

Note: Duration of all theory papers will be of Three Hours.

### Elective-I

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Board of Study</th>
<th>Subject Code</th>
<th>Subject Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Information Technology</td>
<td>533131 (33)</td>
<td>Cloud Computing</td>
</tr>
<tr>
<td>2</td>
<td>Electronics and Telecommunication</td>
<td>533132 (28)</td>
<td>Advanced Digital Communication Systems</td>
</tr>
<tr>
<td>3</td>
<td>Computer Science &amp; Engg.</td>
<td>533133 (22)</td>
<td>Advanced Computer Architecture</td>
</tr>
</tbody>
</table>
Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: I  Branch: Information Technology.
Subject: DISTRIBUTED OPERATING SYSTEM  Code: 533111 (33)
Total Theory Periods: 40  Total Tutorial Periods: 12
Total Marks in End Semester Exam:100
Minimum number of class tests to be conducted: 02.

UNIT I:

UNIT II:
Interprocess communication: Remote Procedure Call (RPC), Life Cycle of Thread, Architecture of RMI, CORBA, Remote Object Invocation, Message Oriented Communication, Stream Oriented Communication, Message passing: case study, Multithreaded Communication: case study

UNIT III:
Synchronization: Introduction, Clock synchronization, Logical clocks, Mutual Exclusion, Election Algorithm., Distributed Transactions, SEMAPHORE in Distributed System.

UNIT IV:

UNIT V:
Naming: Naming Entities, Locating Mobile Entities, Removing Unreferenced Entities

TEXT BOOKS:
2) Andrew S. Tanenbaum, Maarten Van Steen, “Distributed Systems: Principles and paradigms”

REFERENCE BOOKS:
Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: I
Subject: Information Technology & Management
Total Theory Periods: 40
Total Marks in End Semester Exam: 100
Minimum number of class tests to be conducted: 02.

Unit- I:
**IT Strategy:** Information revolution, Business and strategy. IT Strategy, Strategy and Success, Design Parameters, Strategic positioning, Evolution of strategy sequences and getting the right, development of a strategy, types of strategy, context and Strategy.

Unit-II:
**IT Management and IT Governance Strategy:** IT management and its roles, IT governance, IT governance and strategy, Technology management process, Technology selection, Strategic aspects of technology. IT and Business alignment, Risk Management, Exploiting IT Capabilities, Deploying IT in strategic manner, Strategic planning for information technology and frameworks, Measuring IT, Performance Measures: Balanced Score Card.

Unit-III:

Unit-IV:
**IT strategies for Knowledge Management:** Knowledge Management, Knowledge Management and IT strategies, role of Knowledge Management in IT strategies for IT companies, knowledge industry and knowledge strategy knowledge workers, IT strategic services, product and Consulting. IT strategies for non –IT companies : Role of IT in non –IT companies , IT Investment decision, measurement of IT, IT strategies for Non-IT companies, IT supply chain management and constraint management, IT enabled supply chain management.

Unit-V:
**IT Strategies in specific scenario :** Enterprise resource planning implementation, mapping IT strategies initiatives to ERP , supply chain contribution and business strategy, IT strategies for business process outsourcing, IT strategy implementation : IT strategy implementation, Development and need of it strategic plan ,IT strategy implementation to gain competitive advantage, IT strategy and leadership, IT strategy and differentiation , Execution and IT strategy.

**TEXT BOOK:**

**REFERENCE BOOKS:**
2. Gottschalk, P “Strategic Knowledge Managements Technology “IGPUSA
3. Hill, C and G Jones “Strategic management “Houghton Miffen USA
Chhattisgarh Swami Vivekanand Technical University, Bhilai

Subject: SOFTWARE ENGINEERING & TQM  Code: 533113 (33)
Total Theory Periods: 40  Total Tutorial Periods: 12
Total Marks in End Semester Exam: 100
Minimum number of class tests to be conducted: 02.

UNIT I: System Analysis and Design

UNIT II: Coding, Documentation & Testing

UNIT III: Software Project Management and Planning

UNIT IV: Project Management Issues

UNIT V: Quality Assurance

Text Book:

Reference Books:
Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: I
Subject: ADVANCED IMAGE TECHNOLOGY
code: 533114 (33)
Total Theory Periods: 40
Total Tutorial Periods: 12
Total Marks in End Semester Exam: 100
Minimum number of class tests to be conducted: 02.

Unit-I
Digital Image Fundamentals:
Image model and its Applications, Relationship between pixels, Fundamental Steps in Image Processing, Elements of Digital image processing systems some basic relationships like neighbours, Imaging Geometry Camera model, Sampling and Quantization,

Unit-II
Image Transformation
Introduction to FT, DFT & FFT, 2D-DFT, DLT, KLT, DWT, Slant, Harr, Walsh transformation, Hadamard transformation, Hotelling transformation, Histogram, Sub-band coding, some properties of the two dimensional Fourier transform.
Wavelet Transform for Image Processing:
Continuous wavelet transform, discrete wavelet transform, multi-resolution analysis, image compression.

Unit-III
Image Smoothing
Neighborhood averaging, Median filtering low pass filters, average of multiple images, Image sharpening by differentiation technique, High pass filtering
Image Restoration

Unit-IV
Image Segmentation and Edge Detection: Region Operations, Crack Edge Detection
Edge Following, Gradient operator s, Compass and Laplace operator s. Threshold detection methods, optimal thresholding, multispectral thresholding, thresholding in hierarchical data structures; edge based image segmentation- edge image thresholding, edge relaxation, border tracing, border detection Filtering: Median, Gradient.

Unit-V
Image compression:
Lossy and lossless techniques, standards of image compression, video compression, standards of video compression, motion compensation, Error free comparison

Text Books:

Reference Books:
Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: I
Subject: Advanced Digital Communication System (Elective-1)
Branch: Information Technology.
Code: 533132 (28)
Total Theory Periods: 40
Total Tutorial Periods: 12
Total Marks in End Semester Exam: 100
Minimum number of class tests to be conducted: 02.

UNIT-I
Digital Transmission - Introduction, Sampling Theorem & its techniques, Nyquist Rate & Nyquist Interval, Quantization, Pulse Modulation, Pulse Code Modulation, Signal to quantization Noise Ratio, Robust Quantization, linear Vs Non linear PCM Codes, VOCODERS, Delta modulation PCM, adaptive delta modulation, Deferential PCM, Pulse transmission, Signal power in binary digital signals. Frequency Division Multiplexer, Time Division Multiplexing, Multiple Access Techniques

UNIT-II
Information Theory - Uncertainty, information & entropy, joint and conditional entropy, Mutual information, Channel capacity: Noise free Channel, Symmetric channel, BSC, casceded channel, BEC, Binary channel, Shannon’s theorem, continuous channel, capacity of Gaussian channel: Shannon - Hartley Theorem, trade-off between B/W & S/N Ratio.

UNIT-III
Error control coding - Linear block codes, Huffman coding, error correcting codes, cyclic codes, convolution codes, properties of convolution codes. Vertebl decoding algorithm, turbo code concept, trellises codes.

UNIT-IVm
Principles of Data Transmission – Digital CW modulation, ASK, PSK, DPSK, DEPSK, QPSK baseband signal receiver, probability of error, probability of error in FSK, PSK and DPSK, matched filter

UNIT-V
Spread Spectrum Techniques – Model of spread spectrum digital communication System, Pseudo noise sequences, Direct Sequence spread spectrum system, CDMA, FH, PN Sequence, Power Requirement, applications, ISDN.

Books –
Textbooks -

Reference Books-
2. Leon W. Couch, “Modern communication systems: Principles and application”, PHI.
3. Taub & Schilling, Principles of Communication System”THM.
Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: I  
Subject: Advanced Computer Architecture (Elective-1)  
Total Theory Periods: 100  
Total Marks in End Semester Exam: 12  
Minimum number of class tests to be conducted: 02.

Unit I:  
Parallel Computer Models  

UNIT II:  
Program and Network Properties  

UNIT III:  
Principles of Scalable Performance  

UNIT IV:  
Processor & Memory Hierarchy  

UNIT V:  
Pipelining and Super scalar Techniques.  

Text Books:  

Reference Books:  
Semester: I  
Subject: Cloud Computing (Elective-1)  
Total Theory Periods: 40  
Total Tutorial Periods: 12  
Total Marks in End Semester Exam: 100  
Minimum number of class tests to be conducted: 02.

ELECTIVE -I

Unit - I : Introduction to Cloud Computing

Unit - II: Services for Cloud Computing
Communication-as-a-Service (CAAS), Infrastructure-as-a-Service (IAAS), Monitoring-as-a-Service (MAAS), Platform-as-a-Service (PAAS), Software-as-a-Service (SAAS).

Unit - III: Data Center Base
The Evolution from the MSP Model to Cloud Computing and Software-as-a-Service, The Cloud Data Center, Basic Approach to a Data Center-Based SOA, Where Open Source Software is Used?, Service-Oriented Architectures as a Step Toward Cloud Computing.

Unit - IV: Cloud Security

Unit – V: Smartphone’s
What is a Smartphone?, Mobile Operating Systems for Smartphone’s (iPhone, Windows Mobile), Google(Android) Blackberry, Ubuntu Mobile Internet, Mobile Platform Virtualization (KVM, VMWare).

Text Books :

Reference Books :
Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: I  Branch: Information Technology.
Subject: Digital Image Processing Laboratory  Code: 533121 (33)
Total Lab Periods: 40  Total Marks in End Semester Exam: 75
Minimum number of class tests to be conducted: 02.

DIGITAL IMAGE PROCESSING LABORATORY
List of Experiment

1. Write a program to perform Point-to-point transformation.
2. Write a program to perform morphological operations.
3. Write a program to perform histogram equalization.
4. Write a program to perform Geometric transformations of given image.
5. Write a program to perform Two-dimensional Fourier transfer.
6. Write a program to perform Linear filtering using convolution.
7. Write a program to perform Highly selective filters.
8. Write a program to perform Ideal filters in the frequency domain.
9. Write a program to perform Non Linear filtering using convolutional masks.
10. Write a program to perform Entropy as a compression measure in given image
11. Write a program to perform Edge detection method of given image.
12. Write a program to perform segmentation method of given image.
13. Write a program to perform feature extraction in given image.
14. Write a program to perform image enhancement of given image
15. Write a program to develop GUI.

List of Tools Required:
1. Matlab

Text books:
Programming with Matlab, Rafael C. Gonzalez & Richard E. Woods,
SOFTWARE TESTING LABORATORY

List of Experiments

1. To perform Record and playback process
2. Creating resilient scripts with assure technology and Performing user actions with a script(including verification points)
3. Creating and using Test object map
4. To perform object recognition and analyze recognition Score also perform pattern based recognition
5. To perform rational software development platform (perspectives, script debugging and editing)
6. To examine extending scripts with script support features and analyze layout and structure of a script
7. To perform Logs and logging options and analyze data pools and external data sources
8. To understand and use the Dashboard with various roles in RQM.
9. Write review and approve an attest plan with RQM.
10. Analysis and perform capture risk attributes, prioritize risk and optimize testing based on risk.
11. To Show requirement traceability and coverage to the test plan in RQM.
12. To analyze Manager Use defect capabilities and to include duplicate defect detection.
13. To analyze the Use of IBM RFT and RQM.
14. To understand workflow control and use work items in RQM.
15. Create and execute a test suite and explain how to run planning and execution status reports.

List of Tools Required:
1. Rational Functional Tester
2. Rational Quality Manager

Text books:

Reference books:
2. Perry, William E. “Effective Methods for Software Testing” by Wiley India Publication