

**Specialization in–Information Technology**

**II SEMESTER**

Sl. No	Course	Course Code	Course Title	Teaching Hours Per Week			Examination				Credits
				Theory	Tutorial/SDA	Practical/Seminar	Duration in hours	CIE Marks	SEE Marks	Total Marks	
				L	T/SDA	P					
1	PCC/PEC/ MDC/PCC(PB) /IPCC	MSCS201	Advanced Operating Systems	3	0	0	03	50	50	100	3
2		MSIT202	Information Retrieval	3	0	0	03	50	50	100	3
3		MSIT203	Enterprise Application Programming	3	2	0	03	50	50	100	4
4		MSIT214X	Professional Elective course 1	3	0	0	03	50	50	100	3
5		MSIT215X	Professional Elective course 2	3	0	0	03	50	50	100	3
6		MSIT206	Mini Project with Seminar	0	0	6	03	50	50	100	3
7	PCCL	MSITL207	Enterprise Application Programming Lab	0	0	4	02	50	50	100	2
8	AEC/SEC	MSCS258	Skill Enhancement For Research Excellence-1	0	0	2	03	50	50	100	1
<b>Total</b>								<b>400</b>	<b>400</b>	<b>800</b>	<b>22</b>

<b>Professional Elective Course-I (PEC)</b>	
<b>Code</b>	<b>Title of the Course</b>
MSIT214A	Cloud Computing
MSIT214B	Deep Learning
MSIT214C	High Performance Computing
MSIT214D	Decision Support System

<b>Professional Elective Course-II(PEC)</b>	
<b>Code</b>	<b>Title of the Course</b>
MSIT215A	Multimedia Communication
MSIT215B	Web Engineering
MSIT215C	Block Chain Technology
MSIT215D	Software Project Planning & Management

# **II SEMESTER**

**Course: MCS201**  
**Credits: 3**  
**SEE: 50 Marks**  
**SEE Hours: 3 Hrs**

**Course: Advanced Operating Systems**  
**L:T:P - 3:0:0**  
**CIE: 50 Marks**  
**Total Marks: 100**

<b>Prerequisites if any</b>	Operating System
<b>Learning objectives</b>	<ul style="list-style-type: none"> <li>Analyze the characteristics of operating systems for multiprocessor and multicomputer architectures.</li> <li>Understand and address the challenges related to designing operating systems.</li> <li>Explore the latest trends in developing mobile operating systems.</li> <li>Evaluate the implications of these trends on performance and user experience.</li> </ul>

**Course Outcomes:**

*On the successful completion of the course, the student will be able to*

COs	Course Outcomes
CO1	Analyze the characteristics of operating systems for multiprocessor and multicomputer architectures.
CO2	Understand and address the challenges related to designing operating systems.
CO3	Explore the latest trends in developing mobile operating systems.
CO4	Evaluate the implications of these trends on performance and user experience.

**Course Structure**

		No. of Lecture Hours	No. of Tutorial Hours	No. of Practical Hours
<b>Module 1 - : Advances In Operating Systems</b>				
1.1	Multiprocessor Operating Systems: System Architectures- Structures of OS - OS design issues - Process synchronization - Process Scheduling and Allocation- Memory Management.	8	-	-
<b>Module 2 -</b>				
2.1	Distributed Operating Systems: System Architectures- Design issues - Communication models - clock synchronization - mutual exclusion - election algorithms- Distributed Deadlock detection.	8	-	-
<b>Module 3-</b>				
3.1	Distributed scheduling - Distributed shared memory - Distributed File system - Multimedia file systems - File placement - Caching.	8	-	-
<b>Module 4-</b>				
4.1	Database Operating Systems: Requirements of Database OS - Transaction process model - Synchronization primitives - Concurrency control algorithms.	8	-	-
<b>Module 5 -</b>				
5.1	Mobile Operating Systems: ARM and Intel architectures - Power Management - Mobile OS Architectures - Underlying OS - Kernel structure and native level programming - Runtime issues- Approaches to power management.	8	-	-
<b>Total No. of Lecture Hours</b>		40	-	-
<b>Total No. of Tutorial Hours</b>		-	-	-
<b>Total No. of Practical Hours</b>		-	-	-

**Text books:**

1. M Singhal and NG Shivaratri , Advanced Concepts in Operating Systems, Tata McGraw Hill Inc, 2001

**Reference Book/s:**

1. A S Tanenbaum, Distributed Operating Systems, Pearson Education Asia, 2001
2. Source Wikipedia, Mobile Operating Systems, General Books LLC, 2010

**Course: MSIT202**  
**Credits: 3**  
**SEE: 50 Marks**  
**SEE Hours: 3 Hrs**

**Course: Information Retrieval**  
**L:T:P - 3:0:0**  
**CIE: 50 Marks**  
**Total Marks: 100**

<b>Prerequisites if any</b>	
<b>Learning objectives</b>	<ul style="list-style-type: none"> <li>• Use the different information retrieval techniques in various application areas</li> <li>• Apply IR principles to locate relevant information collections of data</li> <li>• Analyze the performance of retrieval systems when dealing with unmanaged data sources</li> </ul>

**Course Outcomes:**

*On the successful completion of the course, the student will be able to*

COs	Course Outcomes
CO1	Describe models like vector-space, probabilistic and language models to identify the similarity of query and document
CO2	Implement retrieval systems for web search tasks.
CO3	Analyze ranked retrieval of a very large number of documents with hyperlinks between them.
CO4	Demonstrate genesis and diversity of information retrieval situations for text and hyper media

**Course Structure**

		No. of Lecture Hours	No. of Tutorial Hours	No. of Practical Hours
<b>Module 1 - :</b>				
1.1	Boolean retrieval. The term vocabulary and postings lists. Dictionaries and tolerant retrieval. Index construction. Index compression.	8	-	-
<b>Module 2 -</b>				
2.1	Scoring, term weighting, and the vector space model. Computing scores in a complete search system. Evaluation in information retrieval. Relevance feedback and query expansion.	8	-	-
<b>Module 3-</b>				
3.1	XML retrieval. Probabilistic information retrieval. Language models for information retrieval. Text classification. Vector space classification.	8	-	-
<b>Module 4-</b>				
4.1	Support vector machines and machine learning on documents, Flat clustering, Hierarchical clustering, Matrix decompositions and latent semantic indexing	8	-	-
<b>Module 5 -</b>				
5.1	Web search basics. Web crawling and indexes, Link analysis.	8	-	-
<b>Total No. of Lecture Hours</b>		<b>40</b>	-	-
<b>Total No. of Tutorial Hours</b>			-	-
<b>Total No. of Practical Hours</b>				-

**Text books:**

1. Introduction to Information Retrieval , Christopher D. Manning and Prabhakar Raghavan and Hinrich Schütze, Cambridge University Press, 2008.
2. Information Storage and Retrieval Systems: Theory and Implementation, Kowalski, Gerald, Mark T Maybury, Springer.
3. Modern Information Retrieval, Ricardo Baeza-Yates, Pearson Education, 2007.

**Course: MSIT203**  
**Credits: 04**  
**SEE: 50 Marks**  
**SEE Hours: 3 Hrs**

**Course: Enterprise Application Programming**  
**L:T:P - 3:2:0**  
**CIE: 50 Marks**  
**Total Marks: 100**

<b>Prerequisites if any</b>	Object-Oriented Programming using Java, Web Technologies, Software Engineering
<b>Learning objectives</b>	<ul style="list-style-type: none"> <li>• Explain WEB basics and their functionalities</li> <li>• Explore Software Development Methodologies.</li> <li>• Ability to apply Suitable Design Patterns in Enterprise Applications</li> </ul>

**Course Outcomes:**

*On the successful completion of the course, the student will be able to*

COs	Course Outcomes
CO1	Identify Functional Areas of an Enterprise.
CO2	Integrate JAVA support and API skills
CO3	Build a WEB application.
CO4	Build Security mechanisms

**Course Structure**

		No. of Lecture Hours	No. of Tutorial Hours	No. of Practical Hours
<b>Module 1</b>				
1.1	<b>Web application and java EE 6:</b> Exploring the HTTP Protocol, Introducing web applications, describing web containers, exploring web architecture models, exploring the MVC architecture. Working with servlets 3.0 Exploring the features of java servlet, Exploring new features in servlet 3.0, Exploring the servlet API, explaining the servlet life cycle, creating a sample servlet, creating a servlet by using annotation, working with servlet config and servlet context objects, working with the HTTP servlet request and HTTP Servlet response interfaces, Exploring request delegation and request scope, implementing servlet collaboration.	8	2	-
<b>Module 2</b>				
2.1	<b>Handling sessions in servlet 3.0:</b> Describing a session, introducing session tracking, Exploring the session tracking, mechanisms, using the java servlet API for session tracking, creating login application using session tracking. Implementing event handling Introducing events, Introducing event handling, working with the servlet events, developing the online shop web application. Working with java server pages: Introducing JSP technology, Exploring new features of JSP2.1, listing advantages of JSP over java servlet, Exploring the architecture of a JSP page, Describing the life cycle of a JSP page, working with JSP basic tags and implicit objects, working with the action tags in JSP, exploring the JSP unified EL, using functions with EL.	8	2	-
<b>Module 3</b>				
3.1	<b>Implementing JSP tag extensions:</b> Exploring the elements of tag extensions, Working with classic tag handlers, Exploring the tag extensions, Working with simple tag handlers. Implementing java server pages standard tag library 1.2: Introducing JSTL, Exploring the tag libraries JSTL, working with the core tag library. Implementing filters: Exploring the need of filters, exploring the working of filters, exploring filters API, configuring a filter, creating a web application using filters, using initializing parameter in filters.	8	2	-

<b>Module 4</b>				
4.1	<b>Persistence Management and Design Patterns:</b> Implementing java persistence using hibernate Introducing hibernate, exploring the architecture of hibernate, downloading hibernate, exploring HQL, understanding hibernate O/R mapping, working with hibernate, Implementing O/R mapping with hibernate. Java EE design patterns: Describing the java EE application architecture, Introducing a design patterns, discussing the role of design patterns, exploring types of patterns.	8	2	-
<b>Module 5</b>				
5.1	<b>Web Frameworks:</b> Working with struts 2 Introducing struts 2, understanding actions in struts 2. Working with java server faces 2.0: Introducing JSF, Explaining the features of JSF, Exploring the JSF architecture, describing JSF elements, Exploring the JSF request processing life cycle. Working with spring 3.0: Introducing features of the spring framework, exploring the spring framework architecture, exploring dependency injection & inversion of control, exploring AOP with spring, managing transactions. Securing java EE 6 applications: Introducing security in java EE 6, exploring security mechanisms, implementing security on an application server.	8	2	-
<b>Total No. of Lecture Hours</b>		<b>40</b>	-	-
<b>Total No. of Tutorial Hours</b>			<b>10</b>	-
<b>Total No. of Practical Hours</b>				-

#### **Textbooks:**

1. JAVA SERVER PROGRAMMING JAVA EE6(J2EE 1.6), Kogent, learning solution Dreamtech press, 2014
2. Java Complete Reference, Herbert Schildt, McGraw Hill, 7th Edition, 2017.

#### **Web links and Video Lectures (e-Resources):**

1. <https://www.tutorialspoint.com/ejb/index.htm>

**Course: MSIT206**

**Credits: 03**

**SEE: 50 Marks**

**SEE Hours: 3 Hrs**

**Course: Mini Project With Seminar**

**L:T:P – 0:0:6**

**CIE: 50 Marks**

**Total Marks: 100**

<b>Prerequisites if any</b>	Basic Communication Skills
<b>Learning objectives</b>	<ul style="list-style-type: none"><li>• Encourage self-directed learning, innovation, and ethical use of diverse information sources.</li><li>• Enhance abilities in organizing, presenting, and discussing ideas clearly and confidently in individual and group settings.</li><li>• Instill time management, punctuality, accountability, and the ability to meet deadlines.</li><li>• Cultivate skills in collaboration, adaptability, critical thinking, and sound judgment for both individual and group success.</li></ul>

**Course Outcomes:**

*On the successful completion of the course, the student will be able to*

<b>COs</b>	<b>Course Outcomes</b>
CO1	Apply interdisciplinary knowledge, critical thinking, and problem-solving skills to carry out a project and confidently defend your work.
CO2	Link concepts across domains to create, develop, and assess ideas and information, ensuring they effectively address the project task.
CO3	Present ideas coherently in both written and oral formats, tailoring your message to different audiences.
CO4	Work effectively in teams toward shared goals while independently reflecting on and improving your own learning process.

**Assessment Details**

**CIE procedure for Mini - Project:**

- The CIE marks awarded for Mini - Project, shall be based on the evaluation of Mini - Project Report, Project Presentation skill and Question and Answer session in the ratio 50:25:25.
- The marks awarded for Mini – Project report shall be the same for all the batch mates.

**Semester End Examination**

- SEE marks for the mini-project shall be awarded based on the evaluation of Mini-Project Report, Presentation skill and Question and Answer session in the ratio 50:25:25 by the examiner.

**Course: MSITL207**  
**Credits: 02**  
**SEE: 50 Marks**  
**SEE Hours: 2 Hrs**

**Course: Enterprise Application Programming Laboratory**  
**L:T:P - 0:0:4**  
**CIE: 50 Marks**  
**Total Marks: 100**

<b>Prerequisites if any</b>	Object-Oriented Programming using Java, Web Technologies, Software Engineering
<b>Learning objectives</b>	<ul style="list-style-type: none"><li>• Develop enterprise level applications.</li><li>• Implement J2EE programming techniques and program enterprise level application</li><li>• To develop distributed applications.</li></ul>

**Course Outcomes:**

*On the successful completion of the course, the student will be able to*

<b>COs</b>	<b>Course Outcomes</b>
CO1	Implement J2EE, Servlet JSP architecture to all other Server-side components.
CO2	Implement component based JSF (Java Server Faces) Framework and front-end development.
CO3	Hibernating (Persistence API) and Application Server to develop enterprise and distributed application.

**Course: MSIT214A**  
**Credits: 3**  
**SEE: 50 Marks**  
**SEE Hours: 3 Hrs**

**Course: Cloud Computing**  
**L:T:P - 3:0:0**  
**CIE: 50 Marks**  
**Total Marks: 100**

<b>Prerequisites if any</b>	Operating Systems, Computer Networks
<b>Learning objectives</b>	<ul style="list-style-type: none"> <li>• Discuss the concepts, characteristics, delivery models and benefits of cloud computing.</li> <li>• Explore the key technical, organisational and compliance challenges of cloud computing.</li> <li>• Grasp the concepts of virtualization efficiently.</li> <li>• Explore the security issues that arise from cloud computing architectures intended for delivering Cloud based enterprise IT services</li> </ul>

**Course Outcomes:**

*On the successful completion of the course, the student will be able to*

COs	Course Outcomes
CO1	Compare the strengths and limitations of cloud computing
CO2	Identify the architecture, infrastructure and delivery models of cloud computing
CO3	Demonstrate the working of VM and VMM on any cloud platforms (public/private), and run a software service on that.
CO4	Identify the known threats, risks, vulnerabilities and privacy issues associated with Cloud based IT services.

**Course Structure**

		No. of Lecture Hours	No. of Tutorial Hours	No. of Practical Hours
<b>Module 1 - :</b>				
1.1	<b>Introduction, Cloud Infrastructure:</b> Cloud computing, Cloud computing delivery models and services, Ethical issues, Cloud vulnerabilities, Cloud computing at Amazon, Cloud computing the Google perspective, Microsoft Windows Azure and online services, Open- source software platforms for private clouds, Cloud storage diversity and vendor lock-in, Energy use and ecological impact, Service level agreements, User experience and software licensing. Exercises and problems.	8	-	-
<b>Module 2 -</b>				
2.1	<b>Cloud Computing: Application Paradigms:</b> Challenges of cloud computing, Architectural styles of cloud computing, Workflows: Coordination of multiple activities, Coordination based on a state machine model: The Zookeeper, The Map Reduce programming model, A case study: The Gre The Web application, Cloud for science and engineering, High- performance computing on a cloud, Cloud computing for Biology research, Social computing, digital content and cloud computing.	8	-	-
<b>Module 3–</b>				
3.1	<b>Cloud Resource Virtualization:</b> Virtualization, Layering and virtualization, Virtual machine monitors, Virtual Machines, Performance and Security Isolation, Full virtualization and paravirtualization, Hardware support for virtualization, Case Study: Xen a VMM based paravirtualization, Optimization of network	8	-	-

	virtualization, vBlades, Performance comparison of virtual machines, The dark side of virtualization, Exercises and problems			
<b>Module 4–</b>				
4.1	<b>Cloud Resource Management and Scheduling:</b> Policies and mechanisms for resource management, Application of control theory to task scheduling on a cloud, Stability of a two- level resource allocation architecture, Feedback control based on dynamic thresholds, Coordination of specialized autonomic performance managers, A utility-based model for cloud-based Web services, Resourcing bundling: Combinatorial auctions for cloud resources, Scheduling algorithms for computing clouds, Fair queuing, Start-time fair queuing, Borrowed virtual time, Cloud scheduling subject to deadlines, Scheduling MapReduce applications subject to deadlines, Resource management and dynamic scaling, Exercises and problems	8	-	-
<b>Module 5 -</b>				
5.1	<b>Cloud Security, Cloud Application Development: Cloud security risks, Security:</b> The top concern for cloud users, Privacy and privacy impact assessment, Trust, Operating system security, Virtual machine Security, Security of virtualization, Security risks posed by shared images, Security risks posed by a management OS, A trusted virtual machine monitor, Amazon web services: EC2 instances, Connecting clients to cloud instances through firewalls, Security rules for application and transport layer protocols in EC2, How to launch an EC2 Linux instance and connect to it, How to use S3 in java, Cloud-based simulation of a distributed trust algorithm, A trust management service, A cloud service for adaptive data streaming, Cloud based optimal FPGA synthesis .Exercises and problems.	8	-	-
<b>Total No. of Lecture Hours</b>		40	-	-
<b>Total No. of Tutorial Hours</b>			-	-
<b>Total No. of Practical Hours</b>				-

### Textbooks:

1. Cloud Computing: Theory and Practice, Dan C Marinescu Elsevier (MK), 2013.
2. Computing Principles and Paradigms, RajkumarBuyya , James Broberg, Andrzej Goscinski, Willey, 2014.
3. Cloud Computing Implementation, Management and Security John W Rittinghouse, James F Ransome, CRC Press, 2013.

### Web links and Video Lectures (e-Resources):

1. <https://www.javatpoint.com/cloud-computing-tutorial>
2. [https://www.tutorialspoint.com/cloud\\_computing/index.htm](https://www.tutorialspoint.com/cloud_computing/index.htm)
3. <https://www.digimat.in/nptel/courses/video/106105167/L01.html> (Video Lectures)

**Course: MSIT214B**  
**Credits: 03**  
**SEE: 50 Marks**  
**SEE Hours: 03 Hrs**

**Course: Deep Learning**  
**L:T:P - 3:0:0**  
**CIE: 50 Marks**  
**Total Marks: 100**

<b>Prerequisites if any</b>	Artificial Intelligence and Machine Learning
<b>Learning objectives</b>	<ol style="list-style-type: none"> <li>1. Figure out the context of neural networks and deep learning</li> <li>2. Know how to use a neural network</li> <li>3. Explore the data needs of deep learning</li> <li>4. Have a working knowledge of neural networks and deep learning</li> <li>5. 5. Explore the parameters for neural networks</li> </ol>

**Course Outcomes:**

*On the successful completion of the course, the student will be able to*

<b>COs</b>	<b>Course Outcomes</b>
CO1	Identify the deep learning algorithms which are more appropriate for various types of learning tasks in various domains
CO2	Implement deep learning algorithms and solve real-world problems.(can be attained through assignment and CIE)
CO3	Execute performance metrics of Deep Learning Techniques. (can be attained through assignment and CIE)

**Course Structure**

		<b>No. of Lecture Hours</b>	<b>No. of Tutorial Hours</b>	<b>No. of Practical Hours</b>
<b>Module 1 - :</b>				
1.1	<b>Machine Learning Basics:</b> Learning Algorithms, Capacity, Overfitting and Underfitting, Hyper parameters and Validation Sets, Estimator, Bias and Variance, Maximum Likelihood Estimation, Bayesian Statistics, Supervised Learning Algorithms, Unsupervised Learning Algorithms, Stochastic Gradient Decent, building a Machine Learning Algorithm, Challenges Motivating Deep Learning.	8	-	-
<b>Module 2 -</b>				
2.1	<b>Deep Feed forward Networks:</b> Gradient-Based Learning, Hidden Units, Architecture Design, BackPropagation. Regularization: Parameter Norm Penalties, Norm Penalties as Constrained Optimization, Regularization and Under-Constrained Problems, Dataset Augmentation, Noise Robustness, SemiSupervised Learning, Multi-Task Learning, Early Stopping, Parameter Tying and Parameter Sharing, Sparse Representations, Bagging, Dropout.	8	-	-
<b>Module 3-</b>				
3.1	<b>Optimization for Training Deep Models:</b> How Learning Differs from Pure Optimization, Challenges in Neural Network Optimization, Basic Algorithms. Parameter Initialization Strategies, Algorithms with Adaptive Learning Rates. Convolutional Networks: The Convolution Operation, Motivation, Pooling, Convolution and Pooling as an Infinitely Strong Prior, Variants of the Basic Convolution Function, Structured Outputs, Data Types, Efficient Convolution Algorithms, Random or Unsupervised Features.	8	-	-

<b>Module 4–</b>				
4.1	<b>Sequence Modelling:</b> Recurrent and Recursive Nets: Unfolding Computational Graphs, Recurrent Neural Networks, Bidirectional RNNs, Encoder-Decoder Sequence-to-Sequence Architectures, Deep Recurrent Networks, Recursive Neural Networks. Long short-term memory	8	-	-
<b>Module 5 -</b>				
5.1	<b>Practical Methodology:</b> Performance Metrics, Default Baseline Models, Determining Whether to Gather More Data, Selecting Hyperparameters, Debugging Strategies, Example: Multi-Digit Number Recognition. Applications: Vision, NLP, Speech.	8	-	-
<b>Total No. of Lecture Hours</b>		40	-	-
<b>Total No. of Tutorial Hours</b>			-	-
<b>Total No. of Practical Hours</b>				-

#### **Text books:**

1. Deep Learning Ian Good fellow and YoshuaBengio MIT Press <https://www.deeplearningbook.org/> 2016.

#### **Reference Book/s:**

1. Neural Networks:Asystematic Introduction Raúl Rojas 1996.
2. Pattern Recognition and machine Learning Chirstopher Bishop 2007.

#### **Online Resources:**

3. <https://www.simplilearn.com/tutorials/deep-learning-tutorial>
4. <https://www.kaggle.com/learn/intro-to-deep-learning>
5. <https://www.javatpoint.com/deep-learning>

Course: MSIT214C

Credits: 03

SEE: 50 Marks

SEE Hours: 03 Hrs

Course: High Performance Computing

L:T:P -3:0:0

CIE: 50 Marks

Total Marks: 100

<b>Prerequisites if any</b>	Data Structures and Algorithms, Operating Systems, Computer Architecture
<b>Learning objectives</b>	<ul style="list-style-type: none"> <li>Determine the methods, costs, and frequency models for I/O performance concerns.</li> <li>Appreciate communication latencies, parallel designs, and connectivity networks.</li> <li>Set a performance model with the appropriate scaling baseline refinement.</li> </ul>

**Course Outcomes:**

*On the successful completion of the course, the student will be able to*

COs	Course Outcomes
CO1	Identify performance issues and Techniques, Cost and frequency models for I/O
CO2	Recognize parallel architectures and interconnection networks, communication latencies.
CO3	Choose the right scaling baseline refined performance model.

**Course Structure**

		No. of Lecture Hours	No. of Tutorial Hours	No. of Practical Hours
<b>Module 1 - :</b>				
1.1	<b>Modern processors and Basic optimization techniques for serial code:</b> Stored-program computer architecture, General-purpose cache-based microprocessor architecture, Vector processors. Scalar profiling, Common sense optimizations, Simple measures, large impact, The role of compilers, C++ optimizations	8	-	-
<b>Module 2 -</b>				
2.1	<b>Data access optimization and Parallel computers:</b> Balance analysis and light speed estimates, Case study: The Jacobi algorithm, Case study: Dense matrix transpose, Algorithm classification and access optimizations, Case study: Sparse matrix-vector multiply. Taxonomy of parallel computing paradigms, Shared-memory computers, Distributed-memory computers, Hierarchical (hybrid) systems, Networks.	8	-	-
<b>Module 3-</b>				
3.1	<b>Basics of parallelization and Shared-memory parallel programming with OpenMP:</b> Parallelism, Parallel scalability, Factors that limit parallel execution, Scalability metrics, Simple scalability laws, Parallel efficiency, Serial performance versus strong scalability, Refined performance models, Choosing the right scaling baseline ,Case study: Can slower processors compute faster?, Load imbalance. Shared-memory parallel programming with OpenMP: Short introduction to OpenMP, Case study: OpenMP-parallel Jacobi algorithm.	8	-	-

<b>Module 4–</b>				
4.1	<b>Efficient Open MP programming and Locality optimizations on ccNUMA architectures:</b> Profiling OpenMP programs, Performance pitfalls, Case study: Parallel sparse matrix-vector multiply. Locality optimizations on ccNUMA architectures: Locality of access on ccNUMA, Case study: ccNUMA optimization of sparse MVM, Placement pitfalls, ccNUMA issues with C++.	8	-	-
<b>Module 5 -</b>				
5.1	<b>Distributed-memory parallel programming with MPI and Efficient MPI programming:</b> Message passing, A short introduction to MPI, Example: MPI parallelization of a Jacobi solver. Efficient MPI programming: MPI performance tools, Communication parameters, Synchronization, serialization, contention, Reducing communication overhead, Understanding intra node point-to-point communication.	8	-	-
<b>Total No. of Lecture Hours</b>		<b>40</b>	-	-
<b>Total No. of Tutorial Hours</b>			-	-
<b>Total No. of Practical Hours</b>				-

### Textbooks:

1. Georg Hager and Gerhard Wellein, “Introduction to High Performance Computing for Scientists and Engineers” , Taylor & Francis Group.
2. “High Performance Computing A Chapter Sampler” , Taylor & Francis Group, CRC Press.

### Online Resources:

1. <https://www.udacity.com/course/high-performance-computing--ud281>
2. <https://shorturl.at/guSX1>

**Course: MSIT214D**  
**Credits: 03**  
**SEE: 50 Marks**  
**SEE Hours: 03 Hrs**

**Course: Decision Support System**  
**L:T:P – 3:0:0**  
**CIE: 50 Marks**  
**Total Marks: 100**

<b>Prerequisites if any</b>	Database Systems, Programming & Data Structures, Statistics and Probability
<b>Learning objectives</b>	<ul style="list-style-type: none"> <li>Recognize the relationship between business information needs and decision making</li> <li>Select appropriate modeling techniques</li> <li>Able to Analyze, design and implement a DSS</li> </ul>

**Course Outcomes:**

*On the successful completion of the course, the student will be able to*

<b>COs</b>	<b>Course Outcomes</b>
CO1	Appraise issues related to the development of DSS
CO2	Select appropriate modeling techniques
CO3	Analyze and implement a DSS
CO4	Demonstrate qualitative and quantitative skills and critical thinking to proficiencies in the application of theory surrounding the DSS

**Course Structure**

		<b>No. of Lecture Hours</b>	<b>No. of Tutorial Hours</b>	<b>No. of Practical Hours</b>
<b>Module 1 - :</b>				
1.1	Introduction to decision support systems: DSS Defined, History of decision support systems, Ingredients of a DSS, Data and model management, DSS Knowledge base, User interfaces, User interfaces, The DSS user, Categories and classes of DSSs, Chapter Summary. Decisions and decision makers Decision makers: who are they, Decision styles, Decision effectiveness, How can a DSS help?, A Typology of decisions, Decision theory and simon’s model of problem solving, Bounded decision making, The process of choice, Cognitive processes, Biases and heuristics in decision making,	8	-	-
<b>Module 2 -</b>				
2.1	Decisions in the organization: Understanding the organization, Organizational culture. Modelling decision processes: Defining the problem and its structures, Decision models, Types of probability, Techniques for forecasting probabilities, Calibration and sensitivity	8	-	-
<b>Module 3–</b>				
3.1	Group decision support and groupware technologies: Group Decision making, the problem with groups, MDM support technologies, Managing MDM activities, the virtual workspace, chapter summary. Executive information systems: What exactly is an EIS, Some EIS history, Why area top executives so different?, EIS components, Making the EIS work, The future of executive decision making and the EIS.	8	-	-

<b>Module 4–</b>			
4.1	Designing and building decision support systems: Strategies for DSS analysis and design, The DSS developer, DSS user interface issues, chapter summary. Implementing and integrating decision support systems: DSS implementation, System evaluation, The importance of integration, chapter summary.	8	-
<b>Module 5 -</b>			
5.1	Creative decision making and problem solving What is creativity?, Creativity defined, The occurrence of creativity, Creative problem solving techniques, Creativity and the role of technology, chapter summary.	8	-
<b>Total No. of Lecture Hours</b>		40	-
<b>Total No. of Tutorial Hours</b>			-
<b>Total No. of Practical Hours</b>			-

**Text books:**

1. Decision support system, George M.Marakas, PHI, 2011.
2. Decision Support Systems, Marakas, 2nd Edition, Pearson India, 2015.

**Online Resources:**

1. <https://www.coursera.org/lecture/business-intelligence-tools/decision-support-systems-video-lecture-E8P9x>

**Course: MSIT215A**  
**Credits: 03**  
**SEE: 50 Marks**  
**SEE Hours: 03 Hrs**

**Course: Multimedia Communications**  
**L:T:P – 3:0:0**  
**CIE: 50 Marks**  
**Total Marks: 100**

<b>Prerequisites if any</b>	Computer Networks, Digital Signal Processing, Operating System
<b>Learning objectives</b>	<ul style="list-style-type: none"> <li>• Discuss the multimedia communications systems, application and basic principles.</li> <li>• Able to analyze the multimedia streaming.</li> <li>• Performing and establishing multimedia communication terminals.</li> </ul>

**Course Outcomes:**

*On the successful completion of the course, the student will be able to*

<b>COs</b>	<b>Course Outcomes</b>
CO1	Deploy the right multimedia communication models.
CO2	Apply QoS to multimedia network applications with efficient routing techniques
CO3	Communicate clearly and concisely, visually, verbally and in writing, using techniques appropriate for the intended audience.
CO4	Identify the basic components of a multimedia project

**Course Structure**

		<b>No. of Lecture Hours</b>	<b>No. of Tutorial Hours</b>	<b>No. of Practical Hours</b>
<b>Module 1 - :</b>				
1.1	Introduction, multimedia information representation, multimedia networks, multimedia applications, Application and networking terminology, network QoS and application QoS, Digitization principles,. Text, images, audio and video.	8	-	-
<b>Module 2 -</b>				
2.1	Text and image compression, compression principles, text compression- Runlength, Huffman, LZW, Document Image compression using T2 and T3 coding, image compression- GIF, TIFF and JPEG	8	-	-
<b>Module 3–</b>				
3.1	Audio and video compression, audio compression - principles, DPCM, ADPCM, Adaptive and Linear predictive coding, Code-Excited LPC, Perceptual coding, MPEG and Dolby coders video compression, video compression principles.	8	-	-
<b>Module 4–</b>				
4.1	Video compression standards: H.261, H.263, MPEG, MPEG 1, MPEG 2, MPEG-4 and Reversible VLCs, Standards for multimedia communications: Reference models, standards relating to interpersonal communications.	8	-	-
<b>Module 5 -</b>				
5.1	Notion of synchronization, presentation requirements, reference model for synchronization, Introduction to SMIL, Multimedia operating systems, Resource management, process management techniques.	8	-	-
<b>Total No. of Lecture Hours</b>		40	-	-
<b>Total No. of Tutorial Hours</b>			-	-
<b>Total No. of Practical Hours</b>				-

**Text books:**

1. Multimedia Communications, Fred Halsall, Pearson education, 2001.
2. Multimedia: Computing, Communications and Applications, Raif Steinmetz, KlaraNahrstedt, Pearson education, 2002.
3. Multimedia Communication Systems, K. R. Rao, Zoran S. Bojkovic, Dragorad A. Milovanovic, Pearson education, 2004

**Online Resources:**

1. <https://www.tutorialspoint.com/multimedia/index.htm>
2. [https://www.youtube.com/watch?v=NPQWUwR6vQ&list=PL6wr\\_B29b3UR5weQ80W8aYMkxEAz92IIC](https://www.youtube.com/watch?v=NPQWUwR6vQ&list=PL6wr_B29b3UR5weQ80W8aYMkxEAz92IIC) (Video Lectures)

**Course: MSIT215B**  
**Credits: 03**  
**SEE: 50 Marks**  
**SEE Hours: 03 Hrs**

**Course: Web Engineering**  
**L:T:P – 3:0:0**  
**CIE: 50 Marks**  
**Total Marks: 100**

<b>Prerequisites if any</b>	Web Technologies, Programming Fundamentals, Database Management, Computer Networks
<b>Learning objectives</b>	<ul style="list-style-type: none"> <li>• Explore the different characteristics of web applications</li> <li>• Describe learning techniques and evaluation metrics for ensuring the proper operability, maintenance and security of a web application.</li> <li>• Explain the testing techniques for web applications</li> </ul>

**Course Outcomes:**

*On the successful completion of the course, the student will be able to*

<b>COs</b>	<b>Course Outcomes</b>
CO1	Employ techniques to analyze and evaluate software architectures on a real-world large-scale web-based software systems
CO2	Analyze and design comprehensive systems for the creation, dissemination, storage, retrieval, and use of electronic records and documents
CO3	Develop solution to complex problems using appropriate method, technologies, framework, web services and content management.
CO4	Illustrate the usage of web servers and use this to develop webpage and store data in database in JSP on Web server.

**Course Structure**

		<b>No. of Lecture Hours</b>	<b>No. of Tutorial Hours</b>	<b>No. of Practical Hours</b>
<b>Module 1 - :</b>				
1.1	<b>Introduction To Web Engineering And Requirements Engineering</b> :Motivation, Categories of Web Applications, Characteristics of Web Applications, Product-related Characteristics, Usage related Characteristics, Development-related Characteristic, Evolution of web engineering - Requirements Engineering Activities RE Specifics in Web Engineering, Principles for RE of Web Applications, Adapting RE Methods to Web Application Development, Requirement Types, Notations, Tools	8	-	-
<b>Module 2 -</b>				
2.1	<b>Web Application Architectures &amp; Modelling Web Applications</b> :Introduction- Categorizing Architectures, Specifics of Web Application Architectures, Components of a Generic Web Application Architecture, Layered Architectures, 2-Layer Architectures, N-Layer Architectures Data-aspect Architectures, Database-centric Architectures, Architectures for Web Document Management, Architectures for Multimedia Data Modeling Specifics in Web Engineering, Levels, Aspects, Phases Customization, Modeling Requirements, Hypertext Modeling, Hypertext Structure Modeling Concepts, Access Modeling Concepts	8	-	-

<b>Module 3–</b>			
3.1	<b>Web Application Design:</b> Introduction, Web Design from an Evolutionary Perspective, Information Design, Software Design: A Programming Activity, Merging Information Design and Software Design, Problems and Restrictions in Integrated Web Design, A Proposed Structural Approach, Presentation Design, Presentation of Nodes and Meshes, Device-independent Development, Approaches, Inter action Design, User Interaction User Interface Organization, Navigation Design, Designing a Link Representation, Designing Link Internals, Navigation and Orientation, Structured Dialog for Complex Activities, Interplay with Technology and Architecture, Functional Design.	8	-
<b>Module 4–</b>			
4.1	<b>Testing Web Applications:</b> Introduction, Fundamentals, Terminology, Quality Characteristics, Test Objectives, Test Levels, Role of the Tester, Test Specifics in Web Engineering, Test Approaches, Conventional Approaches, Agile Approaches, Test Scheme, Three Test Dimensions, Applying the Scheme to Web Applications, Test Methods and Techniques, Link Testing, Browser Testing, Usability Testing, Load, Stress, and Continuous Testing, Testing Security, Test-driven Development, Test Automation, Benefits and Drawbacks of Automated Test, Test Tools.	8	-
<b>Module 5 -</b>			
5.1	<b>Web Project Management:</b> Understanding Scope, Refining Framework Activities, Building a Web Team, Managing Risk, Developing a Schedule, Managing Quality, Managing Change, Tracking the Project. Introduction to node JS - web sockets.	8	-
<b>Total No. of Lecture Hours</b>		40	-
<b>Total No. of Tutorial Hours</b>			-
<b>Total No. of Practical Hours</b>			-

### Online Resources:

1. <https://www.youtube.com/watch?v=JsbxB2l7QGY>
2. <https://www.geeksforgeeks.org/web-technology>
3. <https://youtu.be/HorJOe2yl8Q>
4. [https://youtu.be/pWG7ajC\\_OVo?list=PL4cUxeGkcC9gksOX3Kd9KPo-O68ncT05o](https://youtu.be/pWG7ajC_OVo?list=PL4cUxeGkcC9gksOX3Kd9KPo-O68ncT05o)
5. [https://youtu.be/6EukZDFE\\_Zg](https://youtu.be/6EukZDFE_Zg)
6. <https://youtu.be/xr6uZDRTna0>

**Course: MSIT215C**  
**Credits: 03**  
**SEE: 50 Marks**  
**SEE Hours: 03 Hrs**

**Course: Block Chain Technology**  
**L:T:P – 3:0:0**  
**CIE: 50 Marks**  
**Total Marks: 100**

<b>Prerequisites if any</b>	Computer Networks, Cryptography, Programming Skills
<b>Learning objectives</b>	<ul style="list-style-type: none"> <li>• Explain the strong technical knowledge of Blockchain technologies.</li> <li>• Analyze the blockchain decentralization and cryptography concepts.</li> <li>• Explore the driving force behind the crypto currency Bitcoin, along with the Decentralization.</li> </ul>

**Course Outcomes:**

*On the successful completion of the course, the student will be able to*

COs	Course Outcomes
CO1	Explore the emerging abstract models for Blockchain Technology and to familiarize with the functional/operational concepts.
CO2	Analyze the various consensus mechanisms, applications, research challenges and future directions.
CO3	Practical implementation of Blockchain operations and solutions using Ethereum

**Course Structure**

		No. of Lecture Hours	No. of Tutorial Hours	No. of Practical Hours
<b>Module 1 - :</b>				
1.1	Blockchain 101: Distributed systems, History of blockchain, Introduction to blockchain, Types of blockchain, CAP theorem and blockchain, Benefits and limitations of blockchain.	8	-	-
<b>Module 2 -</b>				
2.1	Decentralization and Cryptography: Decentralization using blockchain, Methods of decentralization, Routes to decentralization, Decentralized organizations. Cryptography and Technical Foundations: Cryptographic primitives, Asymmetric cryptography, Public and private keys	8	-	-
<b>Module 3–</b>				
3.1	Bitcoin and Alternative Coins A: Bitcoin, Transactions, Blockchain, Bitcoin payments B: Alternative Coins, Theoretical foundations, Bitcoin limitations, Namecoin, Litecoin, Primecoin, Zcash	8	-	-
<b>Module 4–</b>				
4.1	Smart Contracts and Ethereum 101: Smart Contracts: Definition, Ricardian contracts. Ethereum 101:Introduction, Ethereum blockchain, Elements of the Ethereum blockchain, Precompiled contracts	8		-
<b>Module 5 -</b>				
5.1	Alternative Blockchains: Blockchains Blockchain-Outside of Currencies: Internet of Things, Government, Health, Finance, Media	8	-	-
<b>Total No. of Lecture Hours</b>		40	-	-
<b>Total No. of Tutorial Hours</b>			-	-
<b>Total No. of Practical Hours</b>				-

**Textbooks**

1. Mastering Blockchain – Distributed ledgers, decentralization and smart contracts explained, Imran Bashir, Packt Publishing Ltd, Second Edition, ISBN 978-1-78712-544-5, 2017.

**Reference Book**

1. Mastering Bitcoins: Unlocking Digital Cryptocurrencies by Andreas Antonopoulos. O'Reilly Media, Inc, 2013.

**Course: MSIT214D**  
**Credits: 03**  
**SEE: 50 Marks**  
**SEE Hours: 03 Hrs**

**Course: Software Project Planning & Management**  
**L:T:P – 3:0:0**  
**CIE: 50 Marks**  
**Total Marks: 100**

<b>Prerequisites if any</b>	Software Engineering
<b>Learning objectives</b>	<ul style="list-style-type: none"> <li>• Explore methods and techniques appropriate to defining, planning and carrying out a project within your chosen specialist area within the management of software projects</li> <li>• Discuss the project to develop the scope of work, provide accurate cost estimates and to</li> <li>• plan the various activities</li> </ul>

**Course Outcomes:**

*On the successful completion of the course, the student will be able to*

COs	Course Outcomes
CO1	Apply risk management analysis techniques that identify the factors that put a project at risk and to quantify the likely effect of risk on project timescales
CO2	Identify the resources required for a project and to produce a work plan and resource schedule
CO3	Monitor the progress of a project and to assess the risk of slippage, revising targets counteract drift
CO4	Use appropriate metrics to management the software development outcome

**Course Structure**

		No. of Lecture Hours	No. of Tutorial Hours	No. of Practical Hours
<b>Module 1 - :</b>				
1.1	Metrics: Introduction, The Metrics Roadmap, A Typical Metrics Strategy, What Should you Measure?, Set Targets and track Them, Understanding and Trying to minimize variability, Act on data, People and Organizational issues in Metrics Programs, Common Pitfalls to watch out for in Metrics Programs, Matrices implementation checklists and tools, Software configuration management: Introduction, Some Basic Definitions and terminology, the processes and activities of software configuration management, configuration status accounting, configuration audit, software configuration management in geographically distributed teams, Metrics in software configuration management, software configuration management tools and automation.	8	-	-
<b>Module 2 -</b>				
2.1	Risk Management: Introduction, What is risk management and why is it important?, Risk management cycle, Risk identification: common tools and techniques, Risk Quantifications, Risk Monitoring, Risk Mitigation, Risks and Mitigation in the context of global project teams, some practical techniques risk management, Metrics in risk management. Project Planning and Tracking: Components of Project Planning and Tracking, The “What “ Part of a Project Plan, The “What Cost “ Part of a Project Plan, The “When “ Part of Project Planning, The “How “ Part of a Project Planning: Tailoring of Organizational Processes For the Project, The “	8	-	-

	By Whom “ Part of the Project Management Plan : Assigning Resources, Putting it all together : The Software Management Plan, Activities Specific to Project Tracking, Interfaces to the Process Database. Project Closure: When Does Project Closure Happen?. Why Should We Explicitly do a Closure?, An Effective Closure Process, Issues that Get Discussed During Closure, Metrics for Project Closure, Interfaces to the Process Database.			
<b>Module 3–</b>				
3.1	Software Requirements gathering: Inputs and start criteria for requirements gathering, Dimensions of requirements gathering, Steps to be followed during requirements gathering, outputs and quality records from the requirements phase, skill sets required during requirements phase, differences for a shrinkwrapped software, challenges during the requirements management phase, Metrics for requirements phase. Estimation: What is Estimation? when and why is Estimation done?, the three phases of Estimation, Estimation methodology, formal models for size Estimation, Translating size Estimate into effort Estimate, Translating effort Estimates into schedule Estimate, common challenges during Estimation , Metrics for the Estimation processes. Design and Development Phases: Some differences in our chosen approach, salient features of design, evolving an architecture/ blueprint, design for reusability, technology choices/ constraints, design to standards, design for portability, user interface issues, design for testability, design for diagnose ability, design for maintainability, design for install ability, interoperability design, challenges during design and development phases, skill sets for design and development, metrics for design and development phases.	8	-	-
<b>Module 4–</b>				
4.1	Project management in the testing phase: Introduction, What is testing?, what are the activities that makeup testing?, test scheduling and types of tests, people issues in testing, management structures for testing in global teams, metrics for testing phase. Project management in the Maintenance Phase: Introduction, Activities during Maintenance Phase, management issues during Maintenance Phase, Configuration management during Maintenance Phase, skill sets for people in the maintenance phase, estimating size, effort, and people resources for the maintenance phase, advantages of using geographically distributed teams for the maintenance phase, metrics for the maintenance phase.	8	-	-
<b>Module 5 -</b>				
5.1	Globalization issues in project management: Evolution of globalization, challenges in building global teams, Models for the execution of global projects, some effective management techniques for managing global teams. Impact of the internet on project management: Introduction, the effect of internet on project management, managing projects for the internet, Effect on the project management activities. People focused process models: Growing emphasis on people centric models, people capability maturity model(P-CMM), other people focused models in the literature, how does an organization choose the models to use?	8	-	-
<b>Total No. of Lecture Hours</b>		40	-	-
<b>Total No. of Tutorial Hours</b>			-	-
<b>Total No. of Practical Hours</b>				-

**Text books:**

1. Managing Global Projects, Ramesh Gopaldaswamy, Tata McGraw Hill, 2013
2. Managing the Software Process, Watts Humphrey, Pearson Education, 2000

**Online Resources:**

1. [https://www.tutorialspoint.com/software\\_engineering/software\\_project\\_management.htm](https://www.tutorialspoint.com/software_engineering/software_project_management.htm)
2. <https://www.javatpoint.com/software-project-management>  
<https://nptel.ac.in/courses/106105218>

**Course: MSCS258**  
**Credits: 1**  
**SEE: 50 Marks**  
**SEE Hours: 3 Hrs**

**Course: Skill Enhancement for Research Excellence-1**  
**L:T:P - 0:0:2**  
**CIE: 50 Marks**  
**Total Marks: 100**

<b>Prerequisites if any</b>	Operating System
<b>Learning objectives</b>	<ul style="list-style-type: none"> <li>Acquire skills in structuring, writing, and ethically presenting high-quality research papers aligned with academic and publication standards.</li> <li>Identify suitable journals, understand peer review dynamics, respond to reviewer feedback, and utilize citation tools for effective manuscript submission.</li> <li>Craft impactful abstracts, posters, and presentations for conferences while collaborating effectively with co-authors and research teams.</li> <li>Keep up with field advancements, embrace open access models, and build a professional network to increase the visibility and relevance of research.</li> </ul>

**Course Outcomes:**

*On the successful completion of the course, the student will be able to*

<b>COs</b>	<b>Course Outcomes</b>
CO1	Develop high-quality research papers and effectively present findings through abstracts and posters at academic conferences.
CO2	Identify suitable journals, submit manuscripts aligned with their scope, and respond constructively to peer review feedback.
CO3	Demonstrate proficiency in structuring research papers and uphold ethical practices in research and publication.
CO4	Utilize citation management software and other research tools to organize references and ensure proper attribution.

**Guidelines for Research paper preparation:**

Each student in a group of two members shall actively participate in carrying out the research work jointly, in constant consultation with the internal guide, mentors or co-guide, and external guide. They must prepare the project report as per the prescribed norms while ensuring plagiarism is avoided. A research group can have a maximum of two members.

**1. Understanding Research Fundamentals**

- **Definition of Research:** Understand what constitutes research and its significance in technology and engineering.
- **Types of Research:** Basic Research: Focused on gaining comprehensive knowledge without immediate applications. Applied Research: Aimed at solving specific problems.
- **Literature Review:**
  - **Conducting a Literature Survey:** Identify relevant academic papers, journals, and conference proceedings. Summarize key findings and methodologies from existing literature.
  - **Critical Analysis:** Evaluate the strengths and weaknesses of existing research. Identify gaps in the literature that your research can address.

**2. Research Methodology: Selecting a Research Topic:** Choose a topic that aligns with your interests and current trends in technology.

- **Research Design:** Decide on qualitative, quantitative, or mixed methods based on your research objectives.
- **Data Collection Techniques:** Surveys, interviews, experiments, and simulations.

**3. Writing Research Proposals**

- **Structure of a Proposal:** Introduction, Literature Review, Methodology, Expected Outcomes, and References.
- **Proposal Presentation:** Practice presenting your proposal to peers and faculty for feedback.

**4. Data Analysis**

- Statistical Tools: Familiarize yourself with tools like MATLAB, R, or Python for data analysis.
  - Interpreting Results: Learn to draw meaningful conclusions from your data and relate them back to your research questions.
5. Writing Research Papers
- Structure of a Research Paper: Abstract, Introduction, Methodology, Results, Discussion, Conclusion, and References.
  - Academic Writing Skills: Focus on clarity, coherence, and proper citation of sources.
  - Peer Review Process: Understand the importance of peer review and how to respond to reviewers' comments.
6. Presentation Skills
- Effective Communication: Develop skills to present your research findings clearly and confidently.
  - Use of Visual Aids: Incorporate slides, charts, and graphs to enhance your presentations.
7. Ethical Considerations in Research
- Understanding Ethics: Familiarize yourself with ethical guidelines related to research involving human subjects, data privacy, and plagiarism.
  - Responsible Conduct of Research: Promote integrity and accountability in your research practices.

### **Submitting Manuscripts to Scopus-Indexed Conferences or Web of Science or Proceedings /Book Chapters**

#### 1. Identify Relevant Conferences

- Research Scopus-Indexed Conferences: Use platforms like Conference Alerts, IEEE Xplore, or the Scopus website to find conferences in your field.
- Check Conference Indexing: Ensure that the conference is indexed in Scopus by checking its official website or the Scopus database.

#### 2. Prepare Your Manuscript

- Follow Conference Guidelines: Each conference has specific formatting and submission guidelines. Adhere to these requirements.
- Structure of the Manuscript: Title, Abstract, Introduction, Methodology, Results, Discussion, Conclusion, and References.
- Language and Clarity: Use clear and concise language. Consider having your manuscript proofread by peers or professionals.
- Submission of manuscript, Registration and Presentation finally Publication

### **Assessment Details:**

The assessment for Skill Enhancement for Research Excellence will be divided into Continuous Internal Evaluation (CIE) and Semester End Examination (SEE), each carrying 50 marks.

#### **Continuous Internal Evaluation (CIE) – 50 Marks**

- CIE shall be conducted weekly and will be assessed based on:
  - Base Papers Referred & Review – 10 Marks
  - Presentations on Proposed Concepts – 15 Marks
  - Preparation of Conference Papers (Preferably Scopus Indexed or Reputed Conferences) – 25 Marks

#### **Semester End Examination (SEE) – 50 Marks**

- The SEE examiner may be appointed from the same college for evaluation.
- The candidate must present their research work before the examiner.
- Mandatory requirement: The candidate must have submitted a paper to a conference or accepted or presented at a reputed conference.

- Marks will be awarded based on:
  - Research Presentation Quality – 25 Marks
  - Clarity of Concept & Methodology – 15 Marks
  - Conference Submission & Acceptance/Presentation – 10 Marks