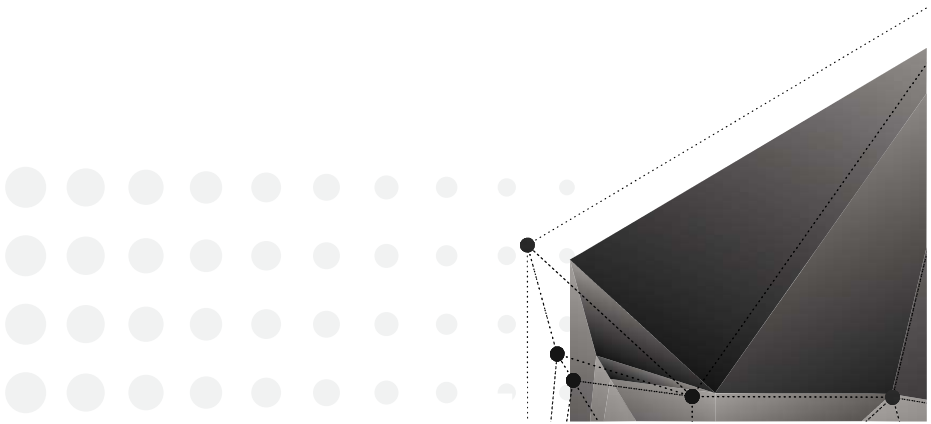


SIXTH SEMESTER
'COMMUNICATION
&
COMPUTER NETWORKING'



CLOUD COMPUTING CONCEPTS

Course Code:	476001
Course Title	Cloud Computing Concepts
No. of Credits	10 (TH:8,T:0,P:4)

COURSE OUTCOMES : On completion of this course, the students should be able to:

1. Understand cloud computing concepts and its various aspects.
2. Understand the various cloud services along with their respective standards
3. Acquire the knowledge of various cloud frameworks and cloud networks.
4. Describe virtualization, cloud security and other cloud computing concepts.

COURSE CONTENTS

1. Cloud Computing: An Overview

- Introduction to cloud computing
- Features of cloud computing
- Basic introduction to cloud service types
- Cloud support services
- Advantages & disadvantages of cloud computing
- Implications of cloud computing.

2. Services & Standards

- Introduction
- Cloud services: infrastructure as a service, Platform as a service, software as a service, data storage as a service
- Features of : Microsoft windows azure, IBM smart cloud
- Basic cloud standards and management.

3. Cloud Networks & Security

- Introduction
- Basic characteristics of cloud networks: elasticity, autonomic networking, programming interface
- Types of cloud networks
- Basic architecture of cloud network
- Cloud security: issues, concerns, challenges

Practical Outcomes: At the end of the course, the student will be able to:-

1. Familiarize with AWS and Azure interfaces and basic services.
2. Get an experience in setting up virtual machines and understanding resource impacts.
3. Proficient in cloud database management and basic API interactions.
4. Aware of cloud security practices through firewall rule implementations.
5. Understand the cloud service costs and collaborative cloud-based applications.

List of Practicals:

1. Sign up and explore AWS or Azure.
2. Set up a virtual machine with a web server.
3. Store and delete a file in cloud storage.
4. Change VM settings and see how it works.
5. Start a database, add and remove data.
6. Use commands to control a VM.
7. Put a basic app on Azure.
8. Look around IBM Smart Cloud features.
9. Draw a simple cloud network online.
10. Set a rule to block certain access in the cloud.
11. Check the cost of using certain cloud services.
12. Edit a file together on Google Docs.

References :

1. Encyclopedia of Cloud Computing by San Murugesan, Irena Bojanova, Wiley
2. Cloud Computing: A Practical Approach by Anthony T. Velte, Toby J. Velte, Robert Elsenpeter, The McGraw Hill
3. Cloud Computing For Dummies, 2nd Edition by Daniel Kirsch, Judith Hurwitz
4. https://www.tutorialspoint.com/cloud_computing/index.htm

**‘Open Elective-1-1’
INFORMATION SECURITY**

Course Code:	436006
Course Title	Information Security
No. of Credits	6 (TH:6,T:0,P:0)

COURSE OUTCOMES: After completion of this course the students are able to:

1. Develop a better understanding of security needs and issues of IT infrastructure.
2. Have basic skills on security audit of networks, operating systems and application software.
3. Get the basic knowledge of Crypto technique and their importance.
4. Have a better understanding of Network security products viz. Firewall etc.

COURSE CONTENTS

Unit - 1:

Introduction to Information Security, Various aspects of information security (PAIN), Security Features of Operating Systems – Authentication, Logs, Audit Features, File System Protection, User Privileges, RAID options, Anti-Virus Software, etc.

Unit - 2 :

Understanding security weaknesses in popular networking protocols – IP, TCP, UDP, RIP, OSPF, HTTP, SMTP, etc.; security weaknesses in common networking devices – Hub, switch, router, WiFi; Security solutions to mitigate security risk of networking protocols (IPSec, HTTPS, etc) and devices (VLAN, VPN, Ingress Filtering, etc)

Unit - 3 :

Basics of Cryptography, PKI, Security considerations while developing softwares

Unit 4 :

Network Security Products – Firewall, IDS/IPS, VPN Concentrator, Content Screening Gateways, etc.

Unit - 5 :

Introduction to Security Standards – ISO 27001, Indian IT Act, IPR Laws; Security Audit procedures;
Developing Security Policies; Disaster Recovery, Business Continuity Planning

Text & Reference Books :

1. Information Security and Cyber Laws, Sarika Gupta, Khanna Publishing House
2. RFCs of protocols listed in content (<https://www.ietf.org>)
3. Various Acts, Laws and Standards (IT Act, ISO27001 Standard, IPR and Copyright Laws, etc.)
4. Security Guideline documents of Operating Systems (OS Manual, Man Pages, etc)
5. <https://www.cert-in.org.in/>
6. <https://www.sans.org/>

**‘Open Elective 1-2’
NETWORK SECURITY**

Course Code:	476002
Course Title	Network Security
No. of Credits	6 (TH:6,T:0,P:0)

COURSE OUTCOME :

1. Develop Concept of Security needed in Communication of data through computers and networks along with Various Possible Attacks.
2. Understand Various Encryption mechanisms for secure transmission of data and management of key required for required for encryption.
3. Understand authentication requirements and study various authentication mechanisms.
3. Understand network security concepts and study different Web security mechanisms.

COURSE CONTENTS

Unit - I : Introduction:

1. Network Security: Definitions & Concepts
2. Access Control
3. Risk Vs Vulnerability
4. Security Threats and Attacks Types

Unit II : Network Security Methods (Overview):

1. Firewalls
2. IP Security
3. VPN
4. Intrusion Detection
5. Web Security
6. SSL
7. TLS

Unit- III : Network Threats:

1. Attack Sources: Classification with brief description
2. Attack in different layers of network

Unit - IV : Authentication:

1. Authentication Requirements
2. Message Authentication Codes
3. User Authentication: Password, Certificate based & Biometric Authentication

SUGGESTED BOOKS:

1. "Cryptography & Network Security", PHI William Stalling
2. "Cryptography & Network Security", Mc Graw Hill Atul Kahate
3. "Cryptography & Network Security", PHI 4 Forouzan
4. "Computer Security", Pearson Education. Matt Bishop
5. Vlabs, "Cryptography Lab" <http://cse29-iiith.vlabs.ac.in/>

**‘Open Elective 2-1’
OPERATIONS RESEARCH**

Course Code:	436002
Course Title	Operations Research
No. of Credits	6 (TH:6,T:0,P:0)

COURSE OUTCOMES: At the end of the course, the student will be able to:

1. Understand the formulation of Linear Programming
2. Analyze and Convert the problem into a mathematical model.
3. Understand and implement the transportation problems at workplace
4. Understand sequencing to optimize the process time for n- job and m-machine
5. Identify and select suitable methods for various games and apply the LP

COURSE CONTENTS

Unit - I :

Development, Definition, Characteristics and phase of Scientific Method, Types of models; General methods for solving operations research models.

Unit - II :

Allocation: Introduction to linear programming formulation, graphical solution, Simplex Method, artificial variable technique, Duality principle. Sensitivity analysis.

Unit - III :

Transportation Problem Formulation optimal solution. Unbalanced transportation problems, Degeneracy. Assignment problem, Formulation optimal solution.

Unit - IV :

Sequencing: Introduction, Terminology, notations and assumptions, problems with n-jobs and two machines, optimal sequence algorithm, problems with n-jobs and three machines.

Unit - V :

Theory of games: introduction, Two-person zero-sum games, The Maximum –Minimax principle, Games without saddle points – Mixed Strategies, $2 \times n$ and $m \times 2$ Games – Graphical solutions, Dominance property, Use of L.P. to games.

Reference Books:

1. Operations Research: an introduction, Hamdy A. Taha, Pearson Education.
2. Operations. Research: theory and application, J.K. Sharma, Macmillan Publishers.
3. Introduction to Operations Research: concept and cases, Frederick S. Hillier and Gerald J. Lieberman, Tata McGraw-Hill

**‘Elective 2-2’
OPTICAL COMMUNICATION & NETWORKING**

Course Code:	476004
Course Title	Optical Communication and Networking
No. of Credits	6 (TH:6,T:0,P:0)

Course outcomes : After completion of this course the students are able to:

1. Identify the different types of data communication equipment and techniques.
2. Use relevant digital modulation techniques.
3. Interpret data communication media.
4. Use fibre optics in data communication.
5. Use OSI model and relevant data communication protocols.
6. Maintain wireless network environment.

COURSE CONTENTS

Unit – I : Fiber Optic Concepts

Introduction to Fiber optic communication. Strength and limitations of fiber optic system Light propagation: reflection, refraction, Snell's law.

Light propagation through cable : Mode of propagation, index profile,

Fiber optic cables : cable construction, fiber optics cable modes, single mode, step index fiber, multimode index fiber, multimode graded index fiber, fiber cable losses.

Light source and Detector : Light emitting diode (LED), Photo Transistor, Laser diode, opto-coupler.

Unit – II : Data Communication Protocols & Interfacing Standard

OSI (Open Systems Interconnection) Reference model Introduction to protocol, FTP, SMTP, TCP/IP, UDP LAN standards, Introduction to IEEE Standards for LAN and GPIB, RS-232 standard: Introduction, and working principle of Network topologies, introduction to star, ring, tree, bus, mesh, hybrid topologies. Basic functions of networking devices: modem, switches, routers, repeaters, hubs, bridges, gateway.

Unit – III : Advanced Data Communication

Introduction to Wi-Fi and Wi- Max, Bluetooth architecture and its layers, Universal serial bus (USB) architecture, Bluetooth and USB.

Text & Reference Books:

1. Gerd Keiser, Optical Fiber Communication, 5th Edition, Mc Graw Hill Education (India) Private Limited, 2015.ISBN:1-25-900687-5.
2. John M Senior, Optical Fiber Communications, Principles and Practice, 3rd Edition, Pearson Education, 2010,ISBN:978-81-317-3266-3.
3. Joseph C Palais, Fiber Optic Communication, Pearson Education, 2005, ISBN:0130085103.

**‘Program Elective 1-1’
MOBILE COMPUTING**

Course Code:	436007
Course Title	Mobile Computing
No. of Credits	6 (TH:6,T:0,P:0)

COURSE OUTCOMES: Upon completion of the course students will be able to:

1. Understand the mobile ecosystem, Gaining insights into the development of android as a mobile platform.
2. Create their first android application using android SDK tools and the Eclipse IDE.
3. Comprehend the android application components enabling them to build interactive and responsive applications.
4. Develop user interfaces (UI) for Android applications.
5. Implement advanced features in Android applications.
6. Acquire skills in data storage and retrieval.

COURSE CONTENTS

UNIT -1 : A brief history of mobile phone generations, The Mobile Ecosystem, Types of Mobile Applications, Mobile Information Architecture, Android Versions, Features of Android, Android Architecture, Installing Android SDK Tools, Configuring Android in Eclipse IDE, Android Development Tools (ADT).

Unit - 2 : Creating android application, Anatomy of android application, Deploying Android app on USB connected Android device, Android application components, Activity life cycle, Understanding activities, Intent Types, Linking activities using intents

Unit-3: Fragments life cycle, Interaction between fragments, Understanding the components of a screen (Layouts), Adapting to display orientation, Action Bar, Views(UI Widgets)-Button, Toast, ToggleButton, CheckBox, RadioButton, Spinner, WebView, EditText, DatePicker, TimePicker, ListView, ProgressBar, Analog and Digital clock, Handling UI events.

Unit-4: Menus-Option, Context, Popup, Images-ImageView, ImageSwitcher, AlertDialog, Alarm manager, SMS, E-mail, Media Player, Using camera, recording video, Handling Telephony Manager

Unit - 5 : Data Storage preferences, Internal Storage, External Storage, Content Provider, The SQLite database, Connecting with SQLite database and operations-Insert, Delete, Update, Fetch, Publishing android applications, Deploying APK files.

Reference Books :

1. Wei-Meng Lee, Beginning Android 4 Application Development, Wiley Publishing, Inc.
2. Pradeep Kothari, “Android Application Development Black Book”, DreamTech Press
3. James C.Sheusi, “Android Application Development for Java Programmers”, Cengage Learning
4. Mark L Murphy, “Beginning Android”, Wiley India Pvt Ltd
5. Sayed Y Hashimi and Satya Komatineni(2009), “Pro Android”, Wiley India Pvt Ltd
6. Reto Meier, Professional Android 4 Application Development, Wiley India Pvt Ltd

**‘Program Elective 1-2’
BASICS OF WEB TECHNOLOGIES**

Course Code:	476005
Course Title	Basics of Web Technologies
No. of Credits	6 (TH:6,T:0,P:0)

COURSE OUTCOMES: At the end of the course, the student will be able to:

1. Understand the basic concepts of web technologies and web standards.
2. Develop an understanding to interactive and user-friendly web pages.
3. Implement responsive web design techniques.
4. Utilize server-side scripting languages (such as PHP or ASP.NET) to create dynamic web pages.
5. Integrate databases into web applications.
6. Apply web security principles and best practices to protect against common vulnerabilities and threats.

COURSE CONTENTS

UNIT -I : Introduction to World Wide Web

Basic protocols and programs, secure connections, application and development tools, web browser features, server characteristics, user log, web site design principles.

UNIT -II : Web Design Architecture

Fundamental, basic architecture of web based systems, types of web system architectures, data access concept, various data access concepts.

UNIT -III : Javascript

Client-side scripting, Basic Concept of JavaScript, Variables, Functions, conditions, Loops and repetition.

UNIT IV: Advance Scripting

JavaScript and objects, web browser environments, forms and validations, DHTML, introduction to Ajax, introduction to XML.

References:

1. “Web Technologies--A Computer Science Perspective”, Jeffrey C. Jackson,
2. “Internet & World Wide Web How To Program”, Deitel, Deitel, Goldberg, Pearson Education
3. “Web programming- Building Internet Application”, Chris Bales
4. “Web Applications: Concepts and Real World Design”, Knuckles

**‘AUDIT COURSE’
INDIAN CONSTITUTION**

Course Code:	AS601
Course Title	Indian Constitution (Audit Course)
No. of Credits	0 (TH:2,T:0,P:0)

COURSE OUTCOMES: After completion of the course the students are able to:

1. Understand the historical background and significance of the Indian Constitution, including the process of its making and the principles enshrined in it.
2. Analyze and interpret key elements of the Constitution.
3. Describe the structure and functioning of the Union Government.
4. Explain the roles and powers of the State Government.
5. Examine the structure and responsibilities of local administration, such as District Administration, Municipal Corporations, and Zila Panchayats.
6. Understand the role and functioning of the Election Commission.

COURSE CONTENTS

1. The Constitution :

- 1.1 Introduction
- 1.2 The History of the Making of the Indian Constitution
- 1.3 Preamble & the Basic Structure.
- 1.4 Fundamental Rights & Duties.
- 1.5 Directive Principles of State Policy (DPSP).

2. Union Government :

- 2.1 Structure of the Indian Union
- 2.2 President– Role and Power
- 2.3 Prime Minister and Council of Ministers
- 2.4 Lok Sabha and Rajya Sabha

3. State Government :

- 3.1 Governor– Role and Power
- 3.2 Chief Minister and Council of Ministers

4. Local Administration :

- 4.1 District Administration
- 4.2 Municipal Corporation
- 4.3 Zila Panchayat

5. Election Commission :

- 5.1 Composition, Role and Functioning of:
 - 5.1.1 Chief Election Commission
 - 5.1.2 State Election Commission

Suggested Learning Resources :

1. Ethics and Politics of the Indian Constitution, Rajeev Bhargava, Oxford University Press, New Delhi,
2. The Constitution of India, B.L. Fadia, Sahitya Bhawan; New edition (2017)
3. Introduction to the Constitution of India, D.D. Basu, Lexis Nexis; Twenty-Third 2018 edition

Suggested Software / Learning Websites :

1. <https://www.constitution.org/cons/india/const.html>
2. <http://www.legislative.gov.in/constitution-of-india>
3. <https://www.sci.gov.in/constitution>
4. <https://www.toppr.com/guides/civics/the-indian-constitution/the-constitution-of-india/>

ENTREPRENEURSHIP AND START-UPS
(Common in all branches of Engineering)

Course Code:	AS602
Course Title	Entrepreneurship and Start-ups
No. of Credits	4 (TH:4,T:0,P:0)

COURSE OUTCOMES: At the end of the course, the student will be able to:

1. Develop an understanding of the concept of entrepreneurship and its relevance in the engineering field, including the importance of creativity, innovation, and problem-solving.
2. Generate and evaluate entrepreneurial ideas, identifying market opportunities and target customers, and assessing the feasibility of a start-up venture.
3. Create a comprehensive business plan and formulate effective strategies for a start-up venture, encompassing marketing, operations, finance, and growth.
4. Comprehend the legal and regulatory considerations involved in establishing and operating a business, ensuring compliance and mitigating legal risks.
5. Design and implement marketing and sales strategies to effectively position and promote the start-up, considering market segmentation, branding, and customer acquisition.
6. Apply financial management principles to plan and manage the financial aspects of a start-up, including budgeting, financial forecasting, and resource allocation.

COURSE CONTENTS

1. Introduction to Entrepreneurship

- Concept of entrepreneurship
- Importance of entrepreneurship in the engineering field
- Traits and characteristics of successful entrepreneurs

2. Ideation and Opportunity Identification

- Generating entrepreneurial ideas
- Evaluating market opportunities
- Conducting market research and feasibility analysis
- Identifying target customers and their needs

3. Business Planning and Strategy

- Business objectives and goals
- Need of Business plan
- Formulating business strategies
- Assessing risk and managing uncertainty

4. Legal and Regulatory Considerations

- Legal forms of business entities
- Compliance with regulations and licenses
- Contracts and agreements in entrepreneurship

5. Marketing and Sales Strategies

- Need of marketing plan
- Methods for marketing
- Pricing strategies
- Sales and distribution

6. Financial Management for Start-ups

- Financial planning and budgeting
- Funding sources and raising capital

7. Operations and Supply Chain Management

- Designing efficient operations processes
- Supply chain management for start-ups
- Quality management and control
- Logistics and inventory management

8. Human Resource Management

- Leadership and organizational culture
- Performance management and motivation

9. Entrepreneurial Mindset and Growth

- Nurturing creativity and innovation
- Overcoming challenges and failures

Reference Books:

1. "The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses" by Eric Ries
2. "The Startup Owner's Manual: The Step-By-Step Guide for Building a Great Company" by Steve Blank and Bob Dorf
3. "Disciplined Entrepreneurship: 24 Steps to a Successful Startup" by Bill Aulet
4. "Zero to One: Notes on Startups, or How to Build the Future" by Peter Thiel and Blake Masters
5. "The Art of Startup Fundraising: Pitching Investors, Negotiating the Deal, and Everything Else Entrepreneurs Need to Know" by Alejandro Cremades
6. "Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers" by Alexander Osterwalder and Yves Pigneur
7. "Venture Deals: Be Smarter Than Your Lawyer and Venture Capitalist" by Brad Feld and Jason Mendelson
8. "The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail" by Clayton M. Christensen
9. "Founders at Work: Stories of Startups' Early Days" by Jessica Livingston.
10. "Start with Why: How Great Leaders Inspire Everyone to Take Action" by Simon Sinek.

MAJOR PROJECT-II

Course Code:	AS603
Course Title	Major Project - II
No. of Credits	3 (TH:0,T:0,P:6)

Introduction : Major Project-II represents the pinnacle of the diploma program, where students demonstrate their acquired knowledge and skills through the execution of a practical project. This capstone experience focuses on project implementation, problem-solving, data analysis, and effective communication. It challenges students to tackle real-world issues and apply their learning to find innovative solutions. Major Project-II nurtures responsibility, autonomy, and professionalism, preparing students for a successful transition into their future careers.

1. Project Execution (20%):

- Successful implementation of the project plan, adhering to the approved methodology.
- Demonstrating practical skills, technical knowledge, and attention to detail during project execution.

2. Regular Monitoring (10%):

- Providing periodic progress updates to project advisors and faculty mentors, showcasing responsibility and timely communication.
- Ability to adapt and make necessary adjustments to the project timeline as needed.

3. Data Analysis (15%):

- Applying appropriate techniques and tools to analyze collected data.
- Deriving meaningful insights and drawing well-supported conclusions.

4. Problem-Solving (15%):

- Identifying and addressing challenges and hurdles encountered during project execution.
- Demonstrating innovative thinking and resourcefulness in problem-solving.

5. Report Writing (15%):

- Preparing a comprehensive project report with a well-structured and organized presentation of the project journey.
- Clearly explaining the methodology, findings, and conclusions in a coherent manner.

6. Presentation (15%):

- Delivering a compelling and engaging project presentation to a panel of faculty members & experts.
- Demonstrating effective communication skills and confidence during the project defense.

7. Final Evaluation (10%):

- Punctuality and adherence to project deadlines.
- Demonstrating initiative and taking ownership of the project.
- Overall professionalism and commitment exhibited throughout the project.

Conclusion: Major Project-II serves as a significant milestone in the academic journey of diploma students. By incorporating marks distribution, the evaluation becomes more transparent, allowing students to understand the weighting of each aspect. Through project execution, problem-solving, data analysis, and effective communication, students will not only showcase their academic prowess but also their readiness to embrace real-world challenges. This capstone experience equips students with the skills and confidence needed to thrive in their chosen professions, paving the way for a successful and rewarding future.

SEMINAR

Course Code:	AS604
Course Title	Seminar
No. of Credits	1 (TH:2,T:0,P:0)

Guidelines for Seminar Presentation:

1. Topic Selection:

Choose a topic that is relevant to the field of gaming and animation, and that interests both the speaker & the audience. Consider emerging trends, technological advancements, or specific areas of expertise within the industry.

2. Research and Information Gathering:

Conduct thorough research on your chosen topic to gather relevant information, statistics, case studies, and examples. Utilize reputable sources such as academic journals, industry publications, and credible websites to ensure the accuracy of information gathered.

3. Presentation Structure:

Organize your seminar presentation into clear sections, including an introduction, main content, and conclusion. Use headings, sub-headings, and bullet points to help the audience follow your presentation easily.

4. Audience Engagement:

Incorporate interactive elements into your presentation to keep the audience engaged. This may include questions, quizzes, demonstrations, or multimedia components such as videos, images, or animations related to your topic.

5. Visual Support:

Create visually appealing slides to support your presentation. Use a clear and readable font, include relevant visuals, and avoid overcrowding slides with excessive texts. Visuals should be used to enhance understanding and highlight key points.

6. Explanation of Technical Concepts:

If your topic involves technical concepts or terminology, explain them in simple and concise terms. Use analogies or real-life examples to help the audience grasp complex ideas.

7. Use of Examples and Case Studies:

Include real-world examples or case studies to illustrate the application of concepts or technologies in the relevant. This will help the audience connect theory to practice and understand the practical implications of your topic.

8. Delivery and Rehearsal:

Practice your presentation multiple times to ensure a smooth and confident delivery. Time yourself to ensure that your presentation fits within the allotted time. Rehearsing will help you become familiar with the content and enhance your overall presentation skills.

9. Q & A and Discussion:

Reserve time at the end of your presentation for questions and discussion. Encourage the audience to ask questions or share their thoughts. Be prepared to answer questions and engage in meaningful dialogue with audience related to the selected topic.

10. Professionalism and Enthusiasm:

Dress appropriately for the occasion and maintain a confident and professional demeanor throughout your presentation. Maintain eye contact with the audience, speak clearly and audibly, and exhibit enthusiasm for your topic.

Evaluation Strategy: The performance of Seminar should be evaluated on the basis of following criteria:

S.N.	Evaluation Parameter	Weightage (%)
1.	Relevance of Topic	10
2.	Content Selection	20
3.	Presentation & Communication Skills	15
4.	Audience Engagement	10
5.	Explanation of Technical Concepts	20
6.	Use of Examples and Case Studies	10
7.	Q&A and Discussion	15
	Total	100

Remember, seminars are not just about sharing information but also about connecting with the audience and creating a memorable experience. Tailor your seminar presentation to cater to the interests and knowledge level of the audience, and aim to inspire and educate them about the concerned technology or topic.
