



**MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR**

**(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)**

### **ANNEXURE-03**

#### **(Syllabi of Open Category Courses)**



## Web Technologies

**680317**

### **Objectives:**

- Understand best technologies for solving web client/server problems
- Analyze and design real time web applications
- Use Java script for dynamic effects and to validate form input entry
- Analyze to Use appropriate client-side or Server-side applications

### **UNIT I**

**History of the internet:** Internetworking concepts, architecture, and protocol: Switch router etc., internet address and domains. Introduction World Wide Web (WWW), Hyper Text Transfer Protocol (HTTP), feature of HTTP protocol HTTP request- response model, Hyper Text Transfer Protocol Secure (HTTPS). Security on the web, proxy server, Firewall.

### **UNIT II**

**Introduction to Hyper Text Markup Language (HTML):** HTML elements, XHTML syntax and Semantics, extensible Markup Language (XML), element, attributes, entity declarations. DTD files and basics of Cascading Style Sheet (CSS), Document object Model (DOM) history and levels, Document tree.

### **UNIT III**

**Introduction to Java Script:** Basic concepts, variables and data types, functions, conditional statements, Loops, Operators, Arrays. Introduction to Web Services: UDDI, SOAP, WSDL.

### **UNIT IV**

**PHP :** Introduction and basic syntax of PHP, decision and looping with examples, PHP and HTML, Arrays, Functions, Browser control and detection, string, Form processing, Files, Advance Features: Cookies and Sessions.

### **UNIT V**

**PHP and MySQL :** Basic commands with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table names, creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables, PHP myadmin and database bugs

### **TEXT BOOKS:**

1. Web Technologies, Uttam Roy, OXFORD University press
2. Web programming with HTML, XHTML and CSS, 2e, Jon Duckett, Wiley India
3. Web programming Bai, Michael Ekedahl, CENAGE Learning, India edition.
4. An Introduction to Web Design + Programming, Paul S.Wang, India Edition

### **Course Outcomes:**

Student would be able to

CO1: **Evaluate** web application architecture, technologies, services and frameworks.

CO2: **Integrate** javascript, Php and server side scripting languages to develop web applications.

CO3: **Debug**, test and deploy web applications in different web servers.

CO4: **Apply** the knowledge of web technology in developing web applications.

CO5: **Implement** small to large scale projects to provide live solutions in web application development fields.

CO6: **Evaluate** different solutions in the field of web application development.



# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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## Network and Cyber Security

**680319**

### **Objectives:**

- To understand and appreciate computer/information security
- To explain the core information assurance (IA) principles
- To provide students with concepts of computer security, cryptography, digital money, secure protocols, detection and other security techniques
- To identify the key components of cyber security network architecture
- To apply cyber security architecture principles
- To describe risk management processes and practices
- Identify security tools and hardening techniques
- To distinguish system and application security threats and vulnerabilities
- To describe different classes of attacks
- To define types of incidents including categories, responses and timelines for response
- To describe new and emerging IT and IS technologies
- To analyze threats and risks within context of the cyber security architecture
- To appraise cyber security incidents to apply appropriate response
- To access additional external resources to supplement knowledge of cyber security

### **UNIT I**

**Computer Security** : Introduction, Need for security, Basics of Cryptography : Plain text and Cipher Text, Substitution techniques, Caesar Cipher, Mono-alphabetic Cipher, Polygram, Polyalphabetic Substitution, Playfair, Hill Cipher, Transposition Cipher, Encryption and Decryption, Symmetric and Asymmetric Key Cryptography, Steganography, Key Range and Key Size, Possible Types of Attacks

### **UNIT II**

**Symmetric Key Algorithms and AES**: Brief history of Asymmetric Key Cryptography, Overview of Asymmetric Key Cryptography, RSA algorithm. Overview of Symmetric key Cryptography, Data Encryption Standard (DES), International Data Encryption Algorithm (IDEA), RC4, RC5, Advanced Encryption Standard (AES) Asymmetric Key Algorithms, Digital Signatures

### **UNIT III**

**Network Security, Firewalls and Virtual Private Networks**: Brief Introduction to TCP/IP, Firewalls, Virtual Private Networks (VPN), Secure Socket Layer (SSL), Transport Layer Security (TLS), Secure Hyper Text Transfer Protocol (SHTTP), Time Stamping Protocol (TSP), Secure Electronic Transaction (SET), Secure Sockets Layer (SSL), E-mail Security.

### **UNIT IV**

**Introduction to information systems**: Types of information Systems, Development of Information Systems, Need for Information security, Threats to Information Systems, Information Assurance, Cyber Security, and Security Risk Analysis.

### **UNIT V**

**Security Policies**: Why Policies should be developed, WWW policies, Email Security policies, Policy Review Process-Corporate policies-Sample Security Policies, Publishing and Notification Requirement of the Policies. Information Security Standards-ISO, IT Act, Copyright Act, Patent Law, IPR.



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## TEXT BOOKS:

1. Bernard Menezes, "Network Security and Cryptography", CEGAGE Learning, ISBN-10:81-315-1349-1, ISBN-13: 978-81-315-1349-1, 2014.
2. Charles Pfleeger," Security in Computing", Prentice Hall, 4th Edition, ISBN-10: 0132390779, ISBN-13: 978-01323907744, 2006.
3. Ulysses Black, "Internet Security Protocols: Protecting IP Traffic", Prentice Hall PTR; 1<sup>st</sup> edition, ISBN-10: 0130142492, ISBN-13: 978-0130142498, 2000.
4. William Stallings, "Cryptography and Network Security", Pearson Education, 6th Edition, ISBN 10: 0133354695, 2013.
5. Jonathan Rosener, "Cyber Law: The law of the Internet", Springer-Verlag, 1997.
6. Mark F Grady, Francesco Parisi, "The Law and Economics of Cyber Security", Cambridge University Press, 2006.

## Course Outcomes:

Student would be able to

CO1: **Discuss** various network security techniques, applications and policies

CO2: **Demonstrate** various computer security mechanisms and Symmetric Key Algorithms.

CO3: **Evaluate** security mechanisms using rigorous approaches by key ciphers

CO4: **Analyze** the vulnerabilities in any computing system to secure an IT infrastructure

CO5: **Employ** appropriate security techniques and policies to protect computers and digital information.

CO6: **Develop** policies and procedures to manage enterprise security risks.

# **Madhav Institute of Technology and Science, Gwalior**

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**Department of Computer Science & Engineering**

## **MACHINE LEARNING USING PYTHON (680320)**

### **COURSE OBJECTIVES:**

- To learn the basic construct of python programming for implementing various Machine Learning algorithms.
- To understand the basic concepts of Machine Learning.
- To use Machine Learning concepts and algorithms for real-world problem solving.

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#### **Unit – I:**

**Introduction to Python Programming:** Setting up programming environment, running python programs from a terminal, variables and simple data types: numeric, string, list, tuple, dictionary, set, boolean. Conditional statements and loops. Lambda functions; various inbuilt functions; Read write operations in files; Using python packages and modules.

#### **Unit – II:**

**Data processing and visualization:** Introduction to Pandas, Installation, reading csv files and performing various operations: slicing, merging, concatenation on various datasets. Introduction to NumPy, vector representation, basic operations on n-dimensional matrices using NumPy. Data visualization using matplotlib, plotting various types of graphs: line, bar, scatter, histogram and pie-charts.

#### **Unit – III:**

**Introduction to Machine Learning:** Basic principles, Applications, Challenges; Supervised, unsupervised and reinforcement learning approaches; Basic steps of Machine learning: data collection, data preparation, choosing a learning model, training a model, evaluation of model, parameter tuning and prediction.

#### **Unit – IV:**

**Supervised Learning:** Linear regression, gradient descent, features, overfitting, regularization and complexity, training, validation, testing data, performance matrices: Mean Squared Error(MSE), Root-Mean-Squared-Error(RMSE), Mean-Absolute-Error(MAE), R<sup>2</sup> or Coefficient of Determination; multivariate regression; applications of regression. Classification: Binary, Multi-class and Multi-label classification; applications; Logistic regression, k-nearest neighbour, Decision trees, Random forests, Support vector machines and Neural networks; Comparison matrix.

#### **Unit – V:**

**Unsupervised Learning:** clustering and association problems; applications; k-means, DBSCAN, Principal Component Analysis, Apriori algorithm for association rule learning problems. Machine learning model building on various datasets available on Kaggle and UCI repositories using Python Machine Learning Library: Scikit-learn.

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### **RECOMMENDED BOOKS:**

- John Hunt, A Beginners Guide to Python 3 Programming, Springer, 1<sup>st</sup> Edition, 2019
- Learn Python the Hard Way: 3rd Edition
- Python Crash Course: A Hands-On, Project-Based Introduction to Programming, By Eric Matthes
- Andreas C. Müller, Sarah Guido, Introduction to Machine Learning with Python, O'Reilly Media,

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Inc, 2016.

- Aurélien Géron, Hands-On Machine Learning with Scikit-Learn and TensorFlow, O'Reilly Media, Inc, 2017.

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**COURSE OUTCOMES:**

After completion of this course, the students would be able to:

- CO1.** define basic concepts of Machine Learning.
- CO2.** Summarize various concepts of python programming, data processing and visualization.
- CO3.** apply machine learning algorithms to solve real world problems using python programming.
- CO4.** compare machine learning algorithms for applicability and performance analysis.
- CO5.** assess various open source datasets and estimate the most suitable machine learning model for prediction process.
- CO6.** build machine learning models on open source datasets using python machine learning library.

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