

SEMESTER-VII

Title of the Paper : Cybersecurity

| | | |
|---|---|---------------|
| Credit: 4 | | Theory |
| Course Outcome: | At the end of this course, the successful students will be able to: <ul style="list-style-type: none">• Know risks inherent in Cyberspace.• Know precautions used to tackle with cybercriminals.• Know different forms of Cybercrime. | |
| Unit –I | | |
| Data, Information, Data Vs Information, characteristics of information, W3 Consortium, Function of W3C, Networking, W3 and internet relationship, Information security, World Wide Web Security, Network security, Cybersecurity Definition and importance. | | |
| Unit –II | | |
| Cybersecurity: As international Problem, Cybersecurity: Common and shared responsibility, Cyberspace basics, Cybercrime basics, Vicious architecture of Cybercrime, Motivations behind cybercrimes. | | |
| Unit –III | | |
| Cyber Attacks, Threat, and Malware, Cyberterrorism, Information security to cybersecurity, Role of risk analysis in cybersecurity, Cybercrime: as a Profession, Cost of Cybercrime, Cyber Stalking, Intellectual property theft, Salami attack, | | |
| Unit –IV | | |
| e-mailbombing, Phishing, Identity theft, Spoofing, Worms, Trojan Horses, Virus, Denial-of-Service (DoS), Distributed Denial-of-Service (DDoS), Defacement attack, Ransomware, Challenges in Cybersecurity. | | |

Referenced Books:

- [1] Rajesh Kumar Goutam, "Cybersecurity Fundamentals", BPB Publication, First Edition.
- [2] Nina Godbole, Sunit Belapure, "Cybersecurity", Wiley Publication,

Suggested Readings:

- [1] William Gibson, "Neuromancer", Ace Science Fiction Books.

Weblinks:

- [1] <http://heecontent.upsdc.gov.in/>
- [2] <http://index-of.es/Varios-2/Neuromancer.pdf>

Wheat
31/07/2021

MP
31/07/2021

Prish
31/7/2021

| Title of the Paper: Quality and Reliability Engineering | | |
|--|--|---------------|
| Credit: 4 Course Outcome: | At the end of this course, the successful students will be able to: <ul style="list-style-type: none">• Know parameters for quality software.• Write quality software.• Enhance the Reliability of Software. | Theory |
| Unit –I | | |
| Software Quality Control, Quality Assurance System, Responsibility for quality, Company-wide Quality Control, Quality Cost Categories, Meaning of Quality of Software, Management for Quality Control and Reliability. | | |
| Unit –II | | |
| Software quality control and Management, Software life-cycle phases, software quality attributes, software quality assurance activities, software quality management, taguchi method for quality improvement. | | |
| Unit –III | | |
| Introduction to reliability, History of reliability, Reliability mathematics, Component reliability and Hazard model, Reliability of series and parallel system, | | |
| Unit –IV | | |
| Software Reliability, Qualitative view of reliability, quantitative view of reliability, definition of software reliability, software environment and reliability management, software reliability models. | | |

Referenced Books:

- [1] Brijendra Singh, "Quality Control & Reliability Analysis", Khanna Publishers
- [2] Daniel Galin, "Software Quality Assurance: from theory to implementation", Pearson edition.

Suggested Readings:

- [1] Michael R. LYU, "Handbook of Software Reliability Engineering", McGraw Hills.
- [2] John D. Musa, "Software Reliability Engineering: More Reliable Software Faster and Cheaper", 2nd Edition.

Weblinks:

- [1] <http://heecontent.upsdc.gov.in/>
- [2] <http://www.cse.cuhk.edu.hk/~lyu/book/reliability/>







| Title of the Paper: Internet of Things | | |
|--|--|---------------|
| Credit: 4 | | Theory |
| Course Outcome: | At the end of this course, the successful students will be able to: <ul style="list-style-type: none">• Recognize IoT devices and learn their Management.• Know the role of IoT Devices in internet structure.• Understand IoT models and their utility. | |
| Unit –I | | |
| What is internet of Things (IoT), IoT Applications, Architecture, Devices, Wireless networks, Security and Privacy, Event-Driven Systems, IoT System Architectures, Protocol Concepts, IoT Oriented Protocols. | | |
| Unit –II | | |
| Bluetooth Stack, Databases, Time Bases, Security, IoT Devices, IoT Device Design Space, Cost of ownership and Power consumption, Duty Cycle and Power Consumption, Platform Design, IoT Network Model. | | |
| Unit –III | | |
| Events, Event as five tuple, Network, Devices and Hubs, Single hub Networks, Multi-hub Networks, Network Models and Physical Networks, IoT Event Analysis, Event Populations, Environmental Interaction Modeling. | | |
| Unit –IV | | |
| Industrial Internet of Things, Industrie 4.0, IoT, IIoT, and Industrie 4.0 relationship, IIoT Architecture, IoT reference model by ITU, IoT business models, Security property layers, Systems Security in IoT, Network Security in IoT. | | |

Referenced Books:

- [1] Dimitrios Serpanos and Marilyn Wolf, "Internet-of-Things (IoT) Systems:Architectures, Algorithms, Methodologies", springer.
- [2] David Hanes and Gonzalo Salgueiro, "IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things", Cisco Press.

Suggested Readings:

- [1] Cuno Pfister, "Getting Started with the Internet of Things", O'Reilly Publication.
- [2] Olivier Hersent, David Boswarthick, Omar Elloumi, "The Internet of Things: Key Applications and Protocols", Wiley Publication.

Weblinks:

- [1] <http://heecontent.upsdc.gov.in/>
- [2] <https://www.elsevier.com/journals/internet-of-things/2542-6605?generatepdf=true>

Upd

MP
31/07/2021

MP

| Title of the Paper: Machine Learning | | |
|--|--|---------------|
| Credit: 4 Course Outcome: | At the end of this course, the successful students will be able to: <ul style="list-style-type: none">• Grasp Machine Learning Concepts.• Use machine learning concepts to achieve automation.• Analyze data set for future decisions. | Theory |
| Unit –I | | |
| What is machine learning, Machine Learning Applications, Learning Associations, Classification, Regression, Unsupervised Learning, Reinforcement Learning, Wellsprings of Machine learning, Brain models. | | |
| Unit –II | | |
| Adoptive Control theory, Psychological Models, Evolutionary Models, Varieties of Machine Learning, Input Vectors, Training Regimes, Performance Evaluation, Boolean Representation in machine learning. | | |
| Unit –III | | |
| Representing Boolean Functions on Cubes, Decision Lists, Symmetric and Voting Functions, Version Spaces and mistakes bounds, Supervised learning definition, Generalization definition, Multivariate Regression, Multidimensional Scaling. | | |
| Unit –IV | | |
| Representing Boolean Functions on Cubes, Bayesian Decision Theory (only introduction), Boolean Representation in machine learning. | | |

Referenced Books:

- [1] Ethem Alpaydm, "Introduction to Machine Learning", The MIT Press Cambridge, Massachusetts, London, England, Second Edition.
- [2] Nils J. Nilsson, "Introduction to Machine Learning", Laboratory Department of Computer Science Stanford University Stanford.

Suggested readings:

- [1] Alex Smola and S.V.N. Vishwanathan, " Introduction to Machine Learning", Cambridge University Press.
- [2] Shai Shalev, Shwartz, Shai Ben-David, "Understanding Machine Learning: From Theory to Algorithms" Cambridge University Press.

Weblinks:

- [1] <http://heecontent.upsdc.gov.in/>
- [2] <https://www.cs.huji.ac.il/~shais/UnderstandingMachineLearning/understanding-machine-learning-theory-algorithms.pdf>

What

31/07/2021

PrL

| Title of the Paper: Data Science | | |
|---|---|---------------|
| Credit: 4 | At the end of this course, the successful students will be able to: | Theory |
| Course Outcome: | <ul style="list-style-type: none"> • Reduce data retrieval time. • Learn better organization of data. • Perform effective clustering • remove data redundancy | |
| Unit –I | | |
| Data Definition, Data Structure, Data Science, Need of Data Science, Data Structure Versus Data Science, Types of Data: Numerical Data, Discrete Data, Continuous Data. | | |
| Unit –II | | |
| Categorical Data, Ordinal Data, Mean, Median, Mode in terms of Data Science, Data Science deviation and variance, | | |
| Unit –III | | |
| Neighbors Concept, K-nearest neighbors (KNN), KNN Application to predict rating, Dimensionality Reduction, Principal Component Analysis, ETL versus ELT. | | |
| Unit –IV | | |
| Reinforcement Learning, Q-learning, Markov Decision process, Dealing with Real World Data, Analyzing the bias/variance trade off, Data Cleaning. | | |

Referenced Books:

- [1] Frank Kane, "Hands-on-Data Science and Python Machine Learning", Packt Publication.
- [2] Jake VanderPlas, "Python Data Science Handbook", Jupyter Publishing,

Suggested Readings:

- [1] Igual, Laura, Seguí, Santi, "Introduction to Data Science: A Python Approach to Concepts, Techniques and Applications", Springer.
- [2] Samuel Burns, "Fundamentals of Data Science: Take the first Step to Become a Data Scientist", Kendile edition.

Weblinks:

- [1] <http://heecontent.upsdc.gov.in/>
- [2] [http://math.ecnu.edu.cn/~lfzhou/seminar/\[Joel_Grus\]_Data_Science_from_Scratch_First_Princ.pdf](http://math.ecnu.edu.cn/~lfzhou/seminar/[Joel_Grus]_Data_Science_from_Scratch_First_Princ.pdf)

White

31/07/2021

Red

| Title of the Paper: Artificial Intelligence | | |
|--|--|--------|
| Credit: 4 | | Theory |
| Course Outcome: | Outcome of Course: At the end of this course, the successful students will be able to: <ul style="list-style-type: none">Analyze real time data and convert them into facts.Normalize data to perform operations.Cluster data to exclude undesired data. | |
| Unit –I | | |
| Artificial Intelligence Definition, Real time AI problems, Underlying assumptions, Production systems and its characteristics, AI problem characteristics, Universe Predictable Problem, State-space representation, Problem-reduction representation. | | |
| Unit –II | | |
| Four categories of production system. Simple Hill climbing, Steepest Ascent Hill Climbing, Local Maximum, Plateau, Ridge, Annealing, Mapping between Facts and Representations, Mutilated Checker Board Problem, | | |
| Unit –III | | |
| Representation of facts, Knowledge Representation, Representational Adequacy, Inferential Adequacy, Inferential efficiency, Acquisitional efficiency, Inheritable Knowledge, AI and Breadth Search Algorithm. | | |
| Unit –IV | | |
| Rule based systems, Representing knowledge as constraints, Model based reasoning, Blind state-space search, Blind AND/OR graph search. | | |

Referenced Books:

- [1] Elaine Rich, Kevin Knight, Shivashankar B Nair, "Artificial Intelligence", Third Edition, McGraw Hill.
- [2] Parag Kulkarni and Prachi Joshi, "Artificial Intelligence: Building Intelligent System", PHI

Suggested Readings:

- [1] Avron Barr and Edward A. Feigenbaum, "Handbook of artificial Intelligence", Department of Computer Science, Stanford University.
- [2] Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach", PHI

Weblinks:

- [1] <http://heecontent.upsdc.gov.in/>
- [2] <https://link.springer.com/journal/10462/volumes-and-issues>

What

31/07/22

Pradi

| Title of the Paper: Web Technologies | | |
|---|---|---------------|
| Credit: 4 Course Outcome: | At the end of this course, the successful students will be able to: <ul style="list-style-type: none">• Understand the Web Server environment.• Work with Web-page designing technologies.• Work with Content Management System to meet needs | Theory |
| Unit –I | | |
| Internet, World Wide Web, World Wide Consortium, Domain Name system, Accessing web server, Web Server, transferring of files from local server to web servers, The role of FTP in internet, Search Engine, Web Browser, Search Engine Versus Web Browser. | | |
| Unit –II | | |
| HTML, DHTML, Head and Body section of HTML page, Paired tags, Singular Tags, Title and footer, Text formatting, Emphasizing material in a web page, Text styles, Text effects, ordered and unordered lists, Border attribute, width and height attributes, Cell spacing and Cell Padding. | | |
| Unit –III | | |
| Row Spanning and Column Spanning, Working with tables, working with divisions, Links and Hyperlinks, inserting flash files in web-page, inserting media-player in web-page, Cascading Styles Sheet (CSS), CSS types, and attachments to web-pages. | | |
| Unit –IV | | |
| Interlinking Web-pages, Search Engine Optimization (SEO), Search Engine evaluation and criterion Enhancement of web-page ranking across search engines, Open-source software and their utility. | | |

Referenced Books:

- [1] Ivan Bayross, "Web Enabled Commercial Applications Development Using HTML, JavaScript, DHTML and PHP", BPB Publication, Fourth Edition.
- [2] Thomas Powell, "HTML & CSS: The Complete Reference", McGraw Hill, Fifth Edition.

Suggested Reading:

- [1] Steven Holzner, "HTML Black Book", dreamtech publication.
- [2] Craig Grannel, "The Essential Guide to CSS and HTML Web Design", friendsof publication.

Weblinks:

- [1] <http://heecontent.upsdc.gov.in/>
- [2] <https://wtf.tw/ref/duckett.pdf>

W. K. S.
31/07/2021

HP
31/07/2021

PS.L

| Title of the Paper: Research Methodology | | |
|--|--|---------------|
| Credit: 4 Course Outcome: | At the end of this course, the successful students will be able to: <ul style="list-style-type: none">• Choose and formulate Research Problems.• Do data analysis.• Handle small projects and write technical reports. | Theory |
| Unit –I | | |
| Meaning of Research, Objectives of Research, Types of Research, Research Approaches, and Significance of research, Research Methods Versus Methodology, Research and Scientific Method, Criteria of Good Research. | | |
| Unit –II | | |
| Research Problems, Research Problem formulation choosing Research Problem, Research Design, need for research design, features of Good Design, Research Hypothesis, Identification of Quality Research Papers, Research Paper Citations and their impacts in research field. | | |
| Unit –III | | |
| Data Collection, Authenticity of data, Data Collection methods: Survey and Questionnaire, Quality Questionnaire Preparation, Evaluation and Classification of data, Data Validation, Quantitative and Qualitative Data. | | |
| Unit –IV | | |
| Mean, Median, Mode, Dispersion, Skewness, Hypothesis, Report, technical report, writing Technical reports, Writing Project report. | | |

Referenced Books:

- [1] C R Kothari and Gaurav Garg, "Research Methodology: Methods and Techniques", New Age.
- [2] Ranjit Kumar, "Research Methodology", person india.

Suggested Readings:

- [1] Alexander M. Novikov, Dmitry A. Novikov, "Research Methodology From Philosophy of Science to Research Design", CRC Press.
- [2] S.K Acharya, P. Pal, A. Biswas, "Research Methodology the Design, Process and Appllication", SSPH Publishing.

Weblinks:

- [1] https://www.cusb.ac.in/images/cusb-files/2020/el/cbs/C_R_Kothari.pdf
- [2] <http://www.yanchukvladimir.com/docs/Library/202010.pdf>

W.P.
31/07/2024

UP
31/07/24

Pal