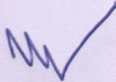


**Autonomous Programme Structure of
Final Year B. Tech. (Computer Engineering)
Academic Year : 2019-2020**


Final Year B. Tech. (Computer Engineering) Semester – I										
Course Code	Course Title	Teaching Scheme Hours /Week			Examination Scheme				Marks	Credit
		Lecture	Tutorial	Practical	In Semester	End Semester	Oral	Practical		
CE 4101	Internet of Things	3	0	0	50	50	0	0	100	3
CE 4102	Software Engineering	3	0	0	50	50	0	0	100	3
HS 4101	Organizational Behavior	3	0	0	50	50	0	0	100	3
OE 4101	Open Elective I	3	0	0	50	50	0	0	100	3
CE 4103	Internet of Things Laboratory	0	0	2	0	0	50	0	50	1
CE 4104	Project Phase-I	0	2	14	100	0	50	0	150	9
	Total	12	2	16	300	200	100	0	600	22
	Grand Total	30			600				600	22

OE 4101: Open Elective I

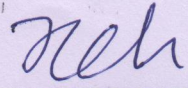
1. Soft Computing
2. Computer Graphics
3. Introduction to Cyber Crime and Forensics



DEAN ACADEMICS
MKSSS's Cummins College
of Engineering for Women
Karvenagar, Pune-411052



Principal
MKSSS's Cummins College of Engg.
For Women, Karvenagar, Pune-52



APPROVED BY
Governing Body Members
MKSSS's Cummins College
of Engineering for Women
Karvenagar, Pune-411052

CE 4101 INTERNET OF THINGS

Teaching Scheme

Lectures : 3 Hrs/week

Examination Scheme

In semester: 50 marks

End semester: 50 marks

Credits: 3

Prerequisite: Elective–III Embedded and Real time systems (PECE 3202)

Course Objectives:

To facilitate the learners to -

1. To understand the fundamental concepts, basic design and components in Internet of things(IoT).
2. Understand and design smaller systems for various devices.
3. To understand the various protocols used in IoT.
4. Learn and implement smaller scenarios using programming language.
5. To understand fundamentals of security in IoT and web and cloud based services for IoT.

Course Outcomes:

By taking this course, the learner will be able to –

1. Apply the concepts of Internet of Things with different components and design process.
2. Apply the various things and design a system.
3. Analyze through Knowledge gain and skills to select application layer protocols for seamless integration of various components of an IoT ecosystem.
4. Implement smaller codes with python programming.
5. Apply the fundamentals of security used in IoT with the different services provided in web and cloud.

Unit 1: Introduction to Internet of Things

(07)

IoT: Definition and characteristics of IoT, Vision of IoT, IoT Ecosystem, IoT Reference Model, Physical Design Model, Logical Design: Functional Block, Communication models, Communication API's, IoT enabling Technologies, IoT Levels and Deployment Templates, Applications of IoT, IoT & M2M.

Unit 2: Embedded Devices and Programming for IoT

(07)

Transducers, Sensors and Actuators for IoT, Introduction to Arduino, Beagle Bone Black, Raspberry Pi, Python Programming for IoT devices.

Unit 3: IoT Protocols

(07)

Protocol Classification , Protocols for different Layers: Link layer, network layer, Transport layer and Application Layer : Message Queue Telemetry Transport (MQTT), Extensible Messaging and Presence Protocol (XMPP), Data Distribution Services (DDS), Advanced Message Queuing Protocol (AMQP), Constrained Application Protocol (COAP), Representational State Transfer (REST), Comparison of Protocols.

Unit 4 : IoT Platform Design methodology and Case studies for IoT Design (07)

Introduction to IoT platform Design methodology, Steps involved in IoT system Design methodology, Case studies: Home automation, Smart cities, Agriculture.

Unit 5: Web of things and Cloud of Things (07)

Four pillars of IoT paradigms, Two Pillars of Web, Cloud of things architecture, Four Deployment Models : Private, Public, Community and Hybrid, Cloud computing paradigm: data collection, Storage and Computing, IoT cloud-based Services using Xivel, Nimbits and other platforms, Applications and features of Cloud IoT.

Unit 6: IoT Privacy, Security and Vulnerabilities Solutions (07)

Introduction to security, Vulnerabilities, Security requirements and Threat Analysis, Use and Misuses Cases, IoT Security Tomography and Layered Attacker Model, Identity Management and Establishment, Access control and Secure Message communication, Security Models, Profiles and Protocols for IoT.

Text Books:

1. Arshdeep Bagha, Vijay Madiseti, '**Internet of Things – A Hands-on-approach**', Universities Press (2014).
2. Srinivasa K.G., Siddesh G.M., Hanumantha Raju R., '**Internet of Things**', Cengage Publication.
3. Rajkamal, '**Internet Of Things: Architecture and Design Principles**' McGraw Hill Education (India) Private Limited.

References:

1. Ovidiu Vermesan, Peter Friess, '**Internet of Things – Converging Technologies for Smart Environments and Integrated Ecosystems**', River Publishers.
2. Honbo Zhou, '**The Internet of Things in the Cloud**', CRC Press(2013).
3. Peter Waher, '**Learning Internet of Things**', Packt Publishing (2015).
4. <https://onlinecourses.nptel.ac.in/>



CE 4102 Software Engineering

Teaching Scheme

Lectures: 3 Hrs/Week

Examination Scheme

In Semester: 50 marks

End Semester: 50 marks

Credits: 3

Prerequisites: Software Design and Architecture (CE 3203)

Course Objectives:

To facilitate the learner to -

1. Develop familiarity with the software design and component based software engineering.
2. Get exposure to the various facets of agile software process model.
3. Learn the basic concepts of refactoring.
4. Gain knowledge about the various aspects of designing and testing of web applications.

Course Outcomes:

By taking this course, the learner will be able to -

1. Apply the concepts of component-level design to realize the solution of a system.
2. Analyze the agile software process model for application development.
3. Analyze the refactoring methods to restructure the classes.
4. Make use of various concepts of designing and testing for web applications.

Unit 1: Software Design Concepts and Component-Level Design (07)

Design within the context of Software Engineering, The design process, Design concepts, Design model. Component-Level Design: What is a component, Designing class-based components, Steps of component-level design, Component-based development.

Unit 2: Introduction to Agile Software Development (07)

Why agile software development - Limitations of traditional process models, Evaluating Agile Benefits, Understanding the Agile Manifesto, Outlining the Four Values of the agile Manifesto, Defining the 12 Agile Principles, Agile approaches - Lean, Scrum and Extreme Programming, Agile team.

Unit 3: Agile Project Planning and Software Practices (07)

Agile project inception, User stories, Estimation, Agile plan. Agile software practices: Refactoring, Test-driven development, Continuous integration.

Unit 4: Introduction to Refactoring (07)

What is Refactoring, Why and when to refactor, Duplicated code, Long method, Extract method, Large class, Extract class, Alternative classes with different interfaces, Move method, Move field, Rename method, Replace method with method object.

Unit 5: Refactoring Methods (07)

Replace data value with object, Change unidirectional association to bidirectional, Switch statements, Replace conditional with polymorphism.

Remove control flag, Introduce assertion, Replace constructor with factory method, Replace error code with exception.

Pull up field, Pull up method, Push down method, Push down field, Extract subclass, Extract superclass, Extract interface, Replace inheritance with delegation.

Unit 6: Design and Testing of Web Applications (07)

WebApp design quality, Design goals, Design pyramid, WebApp interface design, Asthetic design, Content design, Architecture design, Navigation design, Component-level design, Object-oriented hypermedia design method.

Testing concepts for WebApps, Testing process - overview, Content testing, User interface testing, Component-level testing, Navigation testing, Configuration testing, Security testing, Performance testing.

Text books:

1. Roger S. Pressman, '**Software Engineering: A Practitioners Approach**', *Tata McGraw Hill*, (7th Edition) (2010).
2. Jonathan Rasmusson, '**The Agile Samurai: How Agile Masters Deliver Great Software**', *Shroff Publishers and Distributers (SPD)*, ISBN: 978-93-5213-411-3, (2016).
3. Martin Fowler, Kent Beck, John Brant, William Opdyke and Don Roberts, '**Refactoring: Improving The Design of Existing Code**', *Pearson Education*, ISBN: 978-81-317-3466-7, (2017).
4. Mark C. Layton, Steven J. Ostermiller, '**Agile Project Management for Dummies**', *Wiley*, (2nd Edition), (2017).

Reference books:

1. Ian Sommerville, '**Software Engineering**', *Person Education*, (8th Edition) (2008).
2. Grady Booch, James Rumbaugh, Ivar Jacobson, '**The Unified Modeling Language User Guide**', *Pearson Education*, (2nd Edition) (2008).

Web References:

1. Official website of R. S. Pressman and Associates, Inc: <http://www.rspa.com/>
2. Agile Software process model: <https://www.agilealliance.org/>
3. Basics of Scrum: <https://www.scrumalliance.org/>



HS 4101 Organizational Behavior

Teaching Scheme

Lectures: 3 Hrs/Week

Examination Scheme

In Semester: 50 marks

End Semester: 50 marks

Credits : 3

Course Objectives:

To facilitate the learner to -

1. Develop familiarity with the concepts related to organizational behavior.
2. Gain knowledge about personality traits and individual behavior.
3. Study group dynamics.
4. Get exposure to the recent trends in Organizational behavior.

Course Outcomes:

By taking this course, the learner will be able to–

1. Explain concepts of organizational behavior, its importance and culture.
2. Outline meaning of personality and how individual behavior impacts organization.
3. Relate with ideas of group dynamics and influence of groups in work place.
4. Recall latest trends in Organizational behavior.

Unit 1: Introduction

(07)

Management and Organizational Behavior (OB), Organizational behavior in historical perspective, Developing an OB model, Challenges and Opportunities for OB, Foundation of individual behavior.

Unit 2: Individual

(08)

Personality, personality frameworks, big five model, perception, individual decision making, attitudes, components of attitudes, attitudes and behavior, Job attitudes, values

Unit 3 : Diversity and Ethics

(06)

Environmental context : diversity and ethics, Communication, Case studies

Unit 4: Trends

(07)

International organizational behavior, emotional intelligence, strategic organizational behavior, Intra-preneurship, flat organization

Unit 5: Group Dynamics

(08)

Foundation of group behavior, stages of group development, group decision making, team building, organizational conflicts and negotiation, power and politics

Unit 6: Dynamic Environment and Culture

(06)

Information technology and globalization, Human resource policies and practices, Learning



Text books:

1. Stephen P. Robbins, Timothy A. Judge, '**Organisational Behavior**', 18th Global Edition, Pearson Education, ISBN: 978-0-13-410398-3
2. Dr. S. S. Khanka, '**Organisational Behaviour (Text and Cases)**' , S. Chand & Company Pvt.Ltd. (2018), ISBN 978-81-219-2014-8
3. Fred Luthans, '**Organizational Behavior**', 12th Edition, McGraw Hill Publication, ISBN-978-1-25-909743-0

Reference Books:

1. Moorhead, Griffin, '**Introduction to Organizational Behavior**', India Edition, Cengage Learning, ISBN: 978-81-315-1242-5.
2. P. Subba Rao, '**Organisational Behaviour (Text , Cases and Games)**', Himalaya Publishing House, ISBN 978-93-5024-673-3.
3. K. Aswathappa, '**Organisational Behavior : Text, Cases & Games**', 10th Revised Edition, Himalaya Publishing House, ISBN 978-93-5051-588-4.

Web resources:

<https://nptel.ac.in/downloads/110105034/#>



CE 4103 Internet of Things Laboratory

Teaching Scheme

Laboratory : 2 Hrs/week

Examination Scheme

Oral: 50 Marks

Credits: 1

Course Objectives:

To facilitate the learners to -

1. Understand various development boards used for Internet of Things(IoT).
2. Learn and Understand the fundamentals of sensor based applications.
3. Implement and solve the problems using high level language.
4. Develop mini applications on IoT boards with proper design.

Course Outcomes:

By taking this course, the learner will be able to :-

1. Build Internet of Things on various development boards.
2. Design the minimum system for sensor based application.
3. Solve the problems related to the primitive needs using IoT.
4. Develop IoT application for distributed environment.

Example List of Laboratory Assignments:

Assignments Group A (Mandatory)

1. Study of Raspberry-Pi, Beagle board, Arduino and other micro controller (History & Elevation)
2. Study of different operating systems for Raspberry-Pi /Beagle board. Understanding the process of OS installation on Raspberry-Pi /Beagle board.
3. Write an application to read the environment temperature. If temperature crosses a threshold value, the application indicated user using LEDSs
4. Understanding the connectivity of Raspberry-Pi /Beagle board circuit with IR sensor. Write an application to detect obstacle and notify user using LEDs.
5. Understanding and connectivity of Raspberry-Pi /Beagle board with camera. Write an application to capture and store the image.



Assignments Group B (Any 2)

1. Understanding and connectivity of Raspberry-Pi /Beagle board with a Zigbee module. Write a network application for communication between two devices using Zigbee.
2. Assignments on Beagle Bone Black :
 - a. Write an application using Beagle board to control the operation of stepper motor.
 - b. Write an application using Beagle board to control the operation of a hardware simulated traffic signal.
 - c. Write an application using Beagle board to control the operation of a hardware simulated lift elevator.
3. Assignments on Cloud of Things:
 - a. Write a server application to be deployed on Raspberry-Pi /Beagle board. Write client applications to get services from the server application.

- b. Create a small dashboard application to be deployed on cloud. Different publisher devices can publish their information and interested application can subscribe.
- c. Create a simple web interface for Raspberry-Pi/Beagle board to control the connected LEDs remotely through the interface.

Assignments Group C (Any 1)

Sample Mini Project Statements :

1. Develop a Real time application like smart home with following requirements: When user enters into house the required appliances like fan, light should be switched ON. Appliances should also get controlled remotely by a suitable web interface. The objective of this application is student should construct complete Smart application in group.
2. Develop a Real time application like a smart home with following requirements: If anyone comes at door the camera module automatically captures his image send it to the email account of user or send notification to the user. Door will open only after user's approval.

References:

1. Rajkamal, '**Internet Of Things: Architecture and Design Principles**' McGraw Hill Education (India) Private Limited.
2. Ovidiu Vermesan, Peter Friess, '**Internet of Things – Converging Technologies for Smart Environments and Integrated Ecosystems**', River Publishers.
3. Honbo Zhou, '**The Internet of Things in the Cloud**', CRC Press(2013).
4. Peter Waher, '**Learning Internet of Things**', Packt Publishing (2015).
5. <https://onlinecourses.nptel.ac.in/>





CE 4104 Project Phase-I

Teaching Scheme

Tutorial : 2 Hrs /week
Practical: 14 Hrs/Week

Examination Scheme

In Semester: 100 marks
Oral Exam : 50 marks

Credits: 9

Summary of the subject:

Final Year Projects represent the culmination of study towards the Bachelor of Engineering degree. Projects offer the opportunity to apply and extend material learned throughout the program. It also provides an opportunity to learn new technologies and frameworks .It gives an enriching experience of working with industry and / or work with real life problems.

Projects are undertaken in small groups. It emphasises on team work and gives the students chance to present and polish their interpersonal and intrapersonal skills.

The projects undertaken, span a diverse range of topics. Projects can be sponsored by a sponsoring company, faculty defined, research oriented or self defined and vary from year to year. Projects can be undertaken in various domains like Artificial Intelligence, Data Warehousing, Data mining, Machine learning, App development, Network security, Networking, Cloud computing, Embedded Systems, Systems programming and many more. Approval of the problem statement by the Course Coordinator is required.

The course necessarily introduces the dimension of workload management. By applying suitable software development processes and project management concepts, students have to conduct this relatively unstructured "assignment" over the course of the semester.

The projects are assessed using a continuous evaluation process. Students can do seminar presentation, submission of a report, oral and technical presentation to present their work.

This course is to be conducted in the first semester.

Course Objectives:



To facilitate the learners to-

- 1) Explore state of art, research approaches, algorithms, products in the domain.
- 2) Formulate a significant and challenging problem statement of relevance.
- 3) Provide a suitable and acceptable design solution to meet requirements considering relevant Social, ethical and legal issues.
- 4) Have systematic approach as a team following best practices and engineering processes.
- 5) Choose and learn relevant tools, APIs, languages, frameworks, technologies for Implementation of the project

- 6) Choose and apply appropriate SDLC approach like waterfall model, agile, RAD, Incremental model, Spiral, Prototyping etc.
- 7) Develop their personal skills

Course Outcomes:

By taking this course the learner will be able to -

- 1) Work in a team to develop the knowledge, skills, ethics and attitudes of a professional engineer.
- 2) Select appropriate tools, API, technologies to build a tested, working prototype, system.
- 3) Deliver solutions to real life problems that are acceptable.
- 4) Construct quality documents for entire Software Development Life Cycle.
- 5) Justify effectively the work done, learning achieved, learning experience, and usefulness of product or service.

Evaluation Criteria:

The project work of the team will be assessed by the Project Guide. The guide will review the work done throughout the duration of the course. The guide can give assignments. The Final semester oral examination will be conducted by examiners where the project group has to present their work using presentations.

Assessment should be done on the basis of the following points:

- The quality of oral, written presentations.
- Fitness of project to problem statement.
- Innovations, well thought contributions in giving a solution, meeting requirements, use of technology and algorithms.
- The process including the project software engineering, teamwork and documentation.
- Understanding which tools, APIs and technologies can be applied and how.



OE 4101 Soft Computing

Teaching Scheme

Lectures : 3 Hrs/Week

Examination Scheme

In Semester : 50 Marks

End Semester: 50 Marks

Credits: 3

Course Objectives:

To facilitate the learners to -

1. To understand basics in soft computing
2. To understand concepts of fuzzy logic and fuzzy sets
3. To understand supervised and unsupervised neural network architecture, training and testing algorithms
4. To understand concept evolutionary programming, genetic algorithm and swarm intelligent systems

Course Outcomes:

By taking this course, the learner will be able to -

1. Identify various soft computing and artificial neural network constunets to solve the problems in engineering domain
2. Experiment with fuzzy logic principles
3. Apply learning algorithms in artificial neural networks
4. Make use of principles of genetic algorithm and swarm intelligece in solving engineering problems

Unit 1: Introduction to Intelligent systems, soft tools and Artificial Neural network (07)

Soft computing constituents and conventional Artificial Intelligence, Artificial Neural network: definition, advantages of artificial neural network, Fuzzy Set Theory, Genetic algorithm, hybrid systems: neuro fuzzy, neuro genetic, fuzzy genetic, soft computing, Introduction to Artificial Neural Network: Fundamental concepts, basic models of artificial neural network, important terminologies of ANNs, McCulloch- Pitts Neuron, linear separability.

Unit 2: Fuzzy logic and fuzzy sets (07)

Introduction to fuzzy logic, fuzzy sets, fuzzy set operations, properties of fuzzy sets, classical relation, fuzzy relation, membership function, fuzzification, Methods of membership value assignments, lambda-cuts for fuzzy set, lambda-cuts for fuzzy relations, defuzzyfication.

Unit 3: Supervised Learning Networks (07)

Introduction, Perceptron Networks: Perceptron learning rule, Architecture, perceptron training algorithm for single output classes, perceptron training algorithm for multiple output classes, perceptron network testing algorithm, Back Propagation Network: flowchart for training process, training algorithm, linear factors of back- propagation networks, number of training data, number of hidden layer nodes, testing algorithm of back- propagation networks

Unit 4: Associative Memory Networks and Unsupervised Learning Networks (07)

Associative Memory Networks: Introduction, Training algorithm for pattern association: Hebb rule, Autoassociative Memory networks, Bidirectional associative memory: architecture, discrete bidirectional associative memory, Unsupervised Learning Networks: Introduction, Fixed wright competitive nets: max net, Kohonan Self organizing feature maps, counterpropogation networks, full counter propogation net.

Unit 5: Genetic Algorithm (07)

Introduction, biological background, genetic algorithms and search space, genetic algorithm vs. traditional algorithms, basic terminologies in in genetic algorithm, simple GA, operations

in genetic algorithm: encoding- binary, octal, selection- Roulette wheel selection, random selection, crossover- single point cross over, two point crossover, mutation- flipping, interchanging, stopping condition for genetic algorithm flow, constraints in genetic algorithm

Unit 6: Swarm Intelligent Systems

(07)

Introduction, background of Ant Intelligent systems, Importance of the Ant Colony Paradigm, Ant colony systems, Development of Ant colony systems, Applications of Ant Colony Intelligence, the working of ant colony systems, practical swarm intelligent systems: The basic of PSO method, Characteristic features

Text Books:

1. S.N. Sivanandam- **“Principles of Soft Computing”**, Second Edition, Wiley India- ISBN- 9788126527410, 2008
2. J. S. R. Jang, CT Sun and E.Mizutani, **“Neuro-Fuzzy and Soft Computing”** , PHI PVT LTD, ISBN 0-13-261066-3. 2015
3. N.P.Padhy, **“Artificial Intelligence and Intelligent Systems”** Oxford University Press, ISBN 10: 0195671546, 2005

References:

1. De Jong, **“Evolutionary Computation: A Unified Approach”**, Cambridge (Massachusetts): MIT Press. ISBN: 0-262-04194-4. 2006
2. S. Rajsekaran and G.A. Vijayalakshmi Pai, **“Neural Networks, Fuzzy Logic and Genetic Algorithm: Synthesis and Applications”** , Prentice Hall of India, ISBN: 0451211243, 2003
3. Sinha N.K., **“ Soft Computing And Intelligent Systems: Theory And Applications”**, ISBN-13: 978-0126464900, Elsevier. 2007.



OE 4102 Open Elective I

COMPUTER GRAPHICS

Teaching Scheme:
Lectures: 3 Hrs/Week

Examination Scheme:
In-Semester: 50 Marks
End-Semester: 50 Marks
Credits: 3

Course Objectives:

Facilitate the learners –

1. To understand basic concepts of computer graphics.
2. To understand and apply various Computer Graphics Algorithms of scan conversion, polygon filling, clipping, projection.
3. To learn 2-D and 3-D transformations.
4. To learn Computer Graphics techniques of shading, hidden surfaces and curves .
5. To get exposure on animation concept and tool to develop an animation

Course Outcomes:

By taking this course, the learner will be able to –

1. Develop logic to perform basic graphic operations and scan conversions.
2. Compare polygon filling and clipping algorithms.
3. Apply mathematics and logic for 2-D and 3-D transformations and projections.
4. Develop the competency to understand the concepts related to curves, fractals and shading
5. Apply basic concepts of animation to design an animation program.

Unit – I: Basics of Computer graphics and (08)

Scan conversions

Introduction to computer graphics and applications, Basics of Graphics systems, lines, line segments, vectors, pixels and frame buffers, Aspect ratio, Resolution , Raster scan & random scan display

DDA and Bresenham's line drawing algorithms, Bresenham's circle drawing algorithm, Line styles- thick line drawing, dotted lines drawing

Display file structure, algorithms and display file interpreter. Primitive operations of display files

Unit – II: Polygons and Clipping algorithms (06)

Introduction to polygon, types of polygon , Inside-outside tests, polygon filling algorithms-flood fill, seed fill, scan line fill

Introduction to window and view-port, viewing transformations, 2-D line clipping: Cohen – Sutherland line clipping algorithm, Polygon clipping: Sutherland Hodgeman algorithm, generalized clipping

Unit – III: 2D and 3D Transformations (08)

2D Transformation: Introduction, Translation, Scaling, Rotation, Reflection and shear, homogeneous coordinate system, representation of transformation matrices in homogeneous form, 3D Transformation: Introduction to 3-D geometry, translation, scaling, rotation
Projections: parallel and perspective projections and its types

Unit –IV: Hidden surfaces algorithms and shading

(08)

Hidden Surfaces: Introduction, Back face detection and removal, Algorithms: Depth buffer (z), Depth sorts (Painter), Area subdivision (Warnock), BSP tree, and Scan line
Illumination Models: Light Sources, Ambient Light, Diffuse reflection, Specular Reflection, and the Phong model Shading Algorithms: Halftone, Gouraud and Phong Shading.

Unit – V : Curves, surfaces and fractals

(06)

Curves and Surfaces: Cubic splines, Bezier, B-splines Fractals: Introduction, Classification, Applications, Fractal generation

Unit – VI: Segment and Animation

(06)

Introduction to segment, Segment table, operations on segment, display file used for segment, Introduction to animation, Animation languages, design of animation sequences, Methods of controlling animation, basic rules of animation, case study -Animation tool

Text books:

1. S. Harrington, '**Computer Graphics**', McGraw-Hill Publications (2nd Edition), (1987), ISBN 0 – 07 – 100472 – 6
2. D. Rogers, '**Procedural Elements for Computer Graphics**', Tata McGraw-Hill Publication (2nd Edition), (2001), ISBN 0 – 07 – 047371 – 4.
3. D. Hearn, M. Baker, '**Computer Graphics – C Version**', Pearson Education (2nd Edition), (2002), ISBN 81 – 7808 – 794 – 4.



Reference books:

1. J. Foley, V. Dam, S. Feiner, J. Hughes, '**Computer Graphics Principles and Practice**', Pearson Education (4th Edition), (2008), ISBN 978-81 – 317 – 0505 – 6.
2. D. Rogers, J. Adams, '**Mathematical Elements for Computer Graphics**', Tata McGraw-Hill Publication (2nd Edition), (2002), ISBN 0 – 07 – 048677 – 8.
3. Donald Hearn and M Pauline Baker, Warren Carithers, '**Computer Graphics with OpenGL**', Pearson Education (4th Edition), ISBN 978-93-325-1871-1
4. F.S. Hill Jr, Stephen M. Kelley, 'Computer Graphics Using OpenGL', PHI (3rd Edition), (2009), ISBN 978-81 – 317 – 2414 – 9.

Online/Web/Other References:

1. NPTEL series – https://onlinecourses.nptel.ac.in/noc21_cs97
Prof. Samit Bhattacharya, IIT Guwahati



OE 4101 Introduction to Cyber Crime and Forensics

Teaching Scheme:

Lecture: 3 Hrs./week

Examination Scheme:

In Semester: 50 Marks

End Semester: 50 Marks

Credits: 3

Course Objectives:

To facilitate the learners to-

- 1 Learn fundamental concepts of cyber security
2. Understand Security challenges presented by mobile devices and information system access in cybercrime world
- 3 Learn tools used in Computer forensics and Cyber Applications
4. Understand risks associated with social media networking

Course Outcome:

By taking this course the learner will be able to-

1. Classify Cyber Crimes
2. Identify threats and risks within context of Cyber Security
3. Outline various laws and acts in Cyber security
4. Appraise various tools used in Cyber Security/ Digital forensics

UNIT- I: Introduction to Cybercrime: Introduction, Cybercrime, and Information Security, Who are Cybercriminals, Classifications of Cybercrimes, Ethical dimensions of cybercrime, Ethics and Morality, Cybercrime: The legal Perspectives and Indian Perspective, Cybercrime and the Indian ITA 2000, A Global Perspective on Cybercrimes (7)



UNIT – II: Cyber Offenses: How Criminals Plan Them: Introduction, How Criminals plan the Attacks, Social Engineering, Cyber stalking, Cyber cafe and Cybercrimes, Botnets: The Fuel for Cybercrime, Attack Vector- Infrastructure / Cloud Computing. (7)

UNIT – III: Cybercrime: Mobile and Wireless Devices : Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones, Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile, Organizational Security Policies and Measures in Mobile Computing Era, Laptops. (8)

UNIT IV:Tools and Methods Used in Cybercrime: Introduction, Proxy Servers and Anonymizers,Phishing, Password Cracking, Keyloggers and Spywares, Virus and Worms, Trojan Horse and Backdoors, Steganography, DoS and DDoS attacks, SQL Injection, Buffer Overflow. (7)

UNIT V: Cyber Security: Organizational Implications Introduction, Cost of Cybercrimes and IPR issues, Web threats for Organizations, Security and Privacy Implications, Social media marketing: Security Risks and Perils for Organizations, Social Computing and the associated challenges for Organizations. (7)

Unit VI : Digital Forensics- Introduction to Digital Forensics, Forensics Software and Hardware, Evaluating computer forensic tools , Software tools and Hardware Tools, New Trends, Sample Case studies. (6)

TEXT BOOK:

1. Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole and Sunil Belapure, Wiley INDIA. ISBN 978-81-265-2179-1
2. Computer Forensics and Investigations Bill Nelson, Amelia Phillips and Christopher Stuart Cenage learning. ISBN 978-81-315-1946-2

REFERENCE BOOK:

1. Intoduction to Cyber Security , Chwan-Hwa(john) Wu,J.David Irwin.CRC Press T&F Group
2. Eoghan Casey,"Digital evidence and computer crime Forensic Science,Computers and the Internet , ELSVIER,2011 ISBN 978-0-12-374268-1

