Home

Savitribai Phule Pune University
Third Year of Artificial Intelligence and Data Science (2019 Course)
317536: Mini Project

Teaching Scheme:	Credit	Examination Scheme:
TH: 02 Hours/Week	01	Term Work (TW): 50 Marks Oral(OR): 25 Marks

Prerequisite Courses, if any: **Computer Networks (317521)**

Companion Course, if any: **Cyber Security (317530), Elective II****

Part A Cyber Security

Course Objectives:

- To understand threats/vulnerabilities to networks and countermeasures.
- To provide understanding of cryptography and its applications.
- To explain various approaches to Encryption techniques.
- To understand working of firewall and IDs.

Course Outcomes:

On completion of the course, learner will be able to–

CO1: Identify basic security attacks and services
CO2: Analyze the vulnerabilities and design a security solution.
CO3: Implement symmetric and asymmetric key algorithms
CO4:Demonstrate network security applications, Firewall, IDs.

List of Assignments (any five assignments)

1. Implementation of S-DES
2. Implementation of S-AES
3. Implementation of Diffie-Hellman key exchange
4. Implementation of RSA.
5. Implementation of ECC algorithm.
6. Enable/Configure (windows/ubuntu)firewall. Create rules to filternetwork trafficand to block unauthorized network traffic.
7. Configure and demonstrate an Intrusion Detection System (IDS) to detect suspicious activities and generate alerts when detected.

Mini Project (any one)

8. Mini Project 1: Implement Cross Site Scripting using stored attack. A stored cross-site scripting vulnerability in the comment functionality. [Note: To implement this assignment, submit a comment that calls the alert function when the blog post is viewed.]
9. Mini Project 2: Implement SQL injection vulnerability attack that causes the application to display details of all theproducts available on website.
10. Mini Project 3: Design the Access control vulnerability. [Note: This assignment has an unprotected admin panel. It is located at an unpredictable location, but the location is disclosed somewhere in the application. Use https://portswigger.net]
11. Mini Project 4: This task is to demonstrate insecure and secured website. Develop a web site and demonstrate how the contents of the site can be changed by the attackers if it is http based and not secured. You can also add payment gateway and demonstrate how money transactions can be hacked by the hackers. Then support your website having https with SSL and demonstrate how secured website is.

Learning Resources

Text Books:

1. Nina Godbole, SunitBelapure, "Cyber Security- Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Wilely India Pvt.Ltd.,ISBN- 978-81-265-2179-1.
2. William Stallings, "Computer Security : Principles and Practices", Pearson 6thEd. ISBN :978-81-317-3351-6

Reference Books:

1. BerouzForouzan, "Cryptography and Network Security", 2nd Ed. TMH, ISBN: 9780070702080.
2. Mark Merkow, "Information Security-Principles and Practices", Pearson Ed. 978-81-317-1288-7.
3. CK Shyamala, "Cryptography and Security", Wiley India Pvt. Ltd, ISBN 978-81-265-2285-9

e-Books: https://heimdalsecurity.com/pdf/cyber_security_for_beginners_ebook.pdf

MOOC Courses:

@The CO-PO mapping table

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	-	2	-	-	-	-	1	-	-	1
CO2	1	1	1	1	2	2	-	-	1	-	-	1
CO3	2	2	2	2	2	2	-	-	1	-	-	1
CO4	2	2	2	2	2	2	-	-	1	-	-	1

Part B : Elective II : Robotics and Automation

Prerequisite Courses, if any:

Companion Course, if any:

Course Objectives:

- To study and survey recent trends in NLP
- To learn and implement different pre-processing techniques
- To design and develop different applications using NLP

Course Outcomes:

On completion of the course, learner will be able to–

CO1: Understand recent trends in NLP
CO2: Implement different pre-processing techniques
CO3: Design and develop various application using NLP

List of Assignments

1. Study Components of Industrial Robot (PUMA, KUKA, FANUC, Motomanetc) and its DH parameters.
2. Design and selection of Gripper / End effector
3. Two Programming exercise on lead through programming for Industrial Application
4. Program for Forward and Inverse kinematics of simple robot configuration (Robo Analyzer/ MATLAB or Open Source)
5. Control experiment using available Hardware or Software (Open Source or MATLAB)
6. Study of robotic system design.
7. Study of sensor integration.
8. Use of open source computer vision programming tool / Matlab, Open CV
9. Report on industrial application of robot /Industrial visit

Note: Choose any 4 assignments from Assignment 1 to Assignment 5 and any 1 assignment

form Assignment 6 to Assignment 9

Learning Resources

Text Books:

1. Groover M.P.- Automation, production systems and computer integrated manufacturing' - Prentice Hall of India
2. John Craig, Introduction to Robotics, Mechanics and Control, 3rd Edition, Pearson Education, 2009
3. R K Mittal & I J Nagrath, Robotics and Control, McGraw Hill Publication, 2015
4. Ganesh Hegde, Industrial Robotics, Laxmi publication
5. S. K. Saha, Introduction to Robotics, TMH International
6. Groover, Industrial Robotics, Tata McGraw-Hill Education

Reference Books:

1. Mark W Spong, M. Vidyasagar, Robot Dynamics And Control, John Wiley & Sons
2. Richard D. Klafter, Robotics Engineering: An Integrated Approach, Pearson

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PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	2	2	1	-	-	1	-	-	2
CO2	2	3	2	2	2	-	-	-	1	-	-	2
CO3	2	3	2	2	2	-	-	-	1	-	-	2
CO4	2	-	-	2	2	1	-	-	1	-	-	2

Part B : Elective II : Natural Language Processing

Prerequisite Courses, if any: **Discrete Mathematics , Data Structure ,Artificial Intelligence**

Companion Course, if any: **Artificial Neural Network**

Course Objectives:

- To study and survey recent trends in NLP
- To learn and implement different pre-processing techniques
- To design and develop different applications using NLP

Course Outcomes:

On completion of the course, learner will be able to–

CO1: Understand recent trends in NLP

CO2: Implement different pre-processing techniques

CO3: Design and develop various application using NLP

List of Assignments

1] Survey of Recent Advances in NLP:

Detailed survey of recent efforts being taken in the field of NLP with respect to approaches, applications, problems etc.

2] To perform various preprocessing tasks in NLP:

Perform various basic pre-processing tasks like tokenization, stemming, lemmatization, stop word removal etc. using inbuilt functions and using regular expressions.

3] Perform Spelling Correction:

Apply minimum edit distance between two strings for spelling correction.

4] Implement a system to detect different types of toxicity like threats, obscenity, insults, and identity-based hate from comments. (Dataset: Wikipedia comments which have been labeled by

human raters for toxic behavior. you can download dataset from https://www.kaggle.com/competitions/jigsaw-toxic-comment-classification-challenge/data)

5] Recommendation system using Voice Chabot. (Use of Google speech engine)

6] Examiner less oral examination system (Speech to text and answer matching)

Note: Assignments 1-4 are mandatory. Perform any 1 from 5, 6.

Learning Resources

Text Books:

1. Steven Bird,Ewan Klein and EdwordLoper," NLP with Python:Analyzing text with the Natural Language Toolkit", O'Reilly Media,Inc

Reference Books:

1. Steven Bird,Ewan Klein and EdwordLoper," NLP with Python:Analyzing text with the Natural Language Toolkit", O'Reilly Media,Inc.
2. Nitin Indurkhya and Fred J. Dameau, "Handbook of Natural Language Processing", 2nd ed. CRC press.

e-Books:

1. Yoav Goldberg. A primer on neural network models for natural language processing, 2015. URL http://u.cs.biu.ac.il/˜yogo/nnlp.pdf

MOOC Courses:

@The CO-PO mapping table

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2									
CO2	2	3	3									
CO3	2	3	3							2	2	

Part B : Elective II : Cloud Computing

PrerequisiteCourses,ifany:Database Management System (310241)

CompanionCourse,ifany:

CourseObjectives:

- To Learn AWS environment.
- To Learn Amazon RDS.
- Todesignand developdifferentapplicationsusing Amazon Sevices.

CourseOutcomes:

On completion of the course, learner will be able to:

CO1: Understanding of AWS environment.
CO2:Understand Amazon RDS
CO3:Understand and use of AWS Lightsail

List of Assignments

1. Setting up AWS Environment: Create a new AWS account, Secure the root user, Create an IAM user to use in the account Set up the AWS CLI, Set up a Cloud9 environment.
2. Setup, Create and visualize data in an Amazon Relational Database (Amazon RDS) MS SQL Express server using Amazon Quick Sight.

3. Setup, Create and connect your Word Press site to an object storage bucket using Lightsail service.

Note: All assignments are mandatory.

Part B : Elective II : Software Modeling and Architecture

Prerequisite Courses, if any: Object Oriented Programming (210243), Software Engineering (210253)

Companion Course, if any: Software Modeling and Architecture

Course Objectives:

- To understand SoftwareModelingandArchitecture
- ToUsetoolsandtechniquesofSoftwareModelingandArchitecture
- To DesignanddevelopapplicationsusingUML
- To ApplytheknowledgeofSoftwareModelingandArchitectureforproblemsolving

Course Outcomes:

On completion of the course, learner will be able to–

CO1: UsetoolsandtechniquesofSoftwareModelingandArchitecture

CO2: ApplytheknowledgeofSoftwareModelingandArchitectureforproblemsolving

CO3: DesignanddevelopapplicationsusingUML

List of Assignments

Select a moderately complex system which has at least 4-5 major functionalities. Identify stakeholders. Actors and write detail problem statement for your system. Implement following scenarios by taking reference of design model implementation using suitable object-oriented language.

1. Prepare Use Case Model
2. Draw detail use case diagram using UML 2.0 notations
3. Draw activity diagram with swim lanes using UML 2.0 Notations for major Use Cases
4. Prepare analysis model-class model
5. Draw sequence diagram for every scenario by using advanced notations using UML2.O(Identify at least 5 major scenarios (sequence flow) for your system)
6. Prepare Object Diagram, Package Diagram, Component diagram, Development diagram
7. Specify and document the architecture and design pattern with the help of templates. Implement the system features and judge the benefits of the design patterns accommodated.

Learning Resources

Text Books:

1.JimArlow,IlaNeustadt,“UML2andtheunifiedprocess–practicalobject-orientedanalysis anddesign”,AddisonWesley,Secondedition,ISBN978-0201770605

2.LenBass,PaulClements,RickKazman,"SoftwareArchitectureinPractice",Second Edition,Pearson,ISBN978-81-775-8996-2

3. Hassan Gomaa, “SoftwareModelingandDesign- UML,Use cases,PatternsandSoftware Architectures”,CambridgeUniversityPress,2011,ISBN978-0-521-76414-8

Erich Gamma,“DesignPatterns”, Pearson, ISBN 0-201-63361-2

References Books:

1.GardyBooch,JamesRambaugh,IvarJacobson,“Theunifiedmodelinglanguageuserguide”,

PearsonEducation,Secondedition,2008,ISBN0-321-24562-8.
2.LanSommerville,"SoftwareEngineering",9thedition,ISBN-13:978-0-13-703515-1ISBN-10:0-13-703515-2.

e-Books:

1. https://dhomaseghanshyam.files.wordpress.com/2016/02/gomaa-softwaremodellinganddesign.pdf

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CO2	1	1	3	-	3	-	-	-	-	-	-	1
CO3	1	1	2	1	2	-	-	-	-	-	-	1