

Semester: VI		
MOBILE APPLICATION DEVELOPMENT (Theory)		
Course Code:	MVJ21CS61	CIE Marks:50
Credits:	3	SEE Marks: 50
Hours:		SEE Duration: 3 Hrs
Course Learning Objectives: The students will be able to		
1	Demonstrate their understanding of the fundamentals of Android operating systems	
2	Demonstrate their skills of using Android software development tools	
3	Familiarize engineering practices and standards used in developing software products and components.	
4	Demonstrate their ability to develop software with reasonable complexity on mobile platform	

UNIT-I	
<p>Introduction to Android Operating System: Android OS design and Features – Android development framework, SDK features, Installing and running applications on Eclipse platform, Creating AVDs, Types of Android applications, best practices in Android programming, Android tools. Android application components – Android Manifest file, Externalizing resources like values, themes, layouts, Menus etc, Android Application Lifecycle – Activities, Activity lifecycle, activity states, monitoring state changes</p> <p>Video link / Additional online information (related to module if any):</p> <p>1. https://www.youtube.com/watch?v=deq8mkt_cxQ</p>	Hrs 8
UNIT-II	
<p>Android User Interface: Measurements – Device and pixel density independent measuring units Layouts – Linear, Relative, Grid and Table Layouts User Interface (UI) Components – Editable and non editable Text Views, Buttons, Radio and Toggle Buttons, Checkboxes, Spinners, Dialog and pickers Event Handling – Handling clicks or changes of various UI components Fragments – Creating fragments, Lifecycle of fragments, Fragment states, Adding fragments to Activity, adding, removing and replacing fragments with fragment transactions, interfacing between fragments and Activities, Multi-screen Activities</p>	Hrs 8

<p>Applications: Design a Simple Calculator App</p> <p>Video link / Additional online information (related to module if any):</p> <p>1. https://www.youtube.com/watch?v=PJ3RdfJ4Np8</p>		
UNIT-III		
<p>Intents and Broadcasts: Intent – Using intents to launch Activities, explicitly starting new Activity, Implicit Intents, passing data to Intents, getting results from Activities, Native Actions, using Intent to dial a number or to send SMS</p> <p>Broadcast Receivers – Using Intent filters to service implicit Intents, Resolving Intent filters, finding and using Intents received within an Activity</p> <p>Notifications – Creating and Displaying notifications, Displaying Toast.</p> <p>Video link / Additional online information (related to module if any):</p> <ul style="list-style-type: none"> https://nptel.ac.in/courses/106/106/106106147/ 		Hrs 8
UNIT-IV		
<p>Persistent Storage: Files – Using application specific folders and files, creating files, reading data from files, listing contents of a directory</p> <p>Shared Preferences – Creating shared preferences, saving and retrieving data using Shared Preference Database – Introduction to SQLite database, creating and opening a database, creating tables, inserting retrieving and deleting data, Registering Content Providers, Using content Providers (insert, delete, retrieve and update)</p> <p>Video link / Additional online information (related to module if any):</p> <ul style="list-style-type: none"> http://developer.android.com/develop/index.htm 		Hrs 8
UNIT-V		
<p>Advanced Topics: Alarms – Creating and using alarms</p> <p>Using Internet Resources – Connecting to internet resource, using download manager</p> <p>Location Based Services – Finding Current Location and showing location on the Map, updating location</p> <p>Video link / Additional online information (related to module if any):</p> <p>1. https://www.codeschool.com/learn/ios</p>		Hrs 8

Course Outcomes: After completing the course, the students will be able to	
CO1	Understand the fundamentals of Android operating systems
CO2	Understand various layouts and designing UI.

CO3	Understand major Android components intents, broadcasting and notifications.
CO4	Understand basic concepts of SQLite database.
CO5	Understand how to utilize Location based services.

Text Books	
1.	Charlie Collins, Michael Galpin and Matthias Kappler, "Android in Practice", DreamTech, 2012
2.	David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, "Beginning iOS 6 Development: Exploring the iOS SDK", Apress, 2013.
3.	Google Developer Training, "Android Developer Fundamentals Course – Concept Reference", Google Developer Training Team, 2017.

Reference Books:	
1.	James Dovey and Ash Furrow, "Beginning Objective C", Apress, 2012
2.	Jeff McWhorter and Scott Gowell, "Professional Mobile Application Development", Wrox, 2012.

Continuous Internal Evaluation (CIE):

Theory for 50 Marks

CIE is executed by way of quizzes (Q), tests (T) and assignments. A minimum of three quizzes are conducted along with tests. Test portion is evaluated for 50 marks and quiz is evaluated for 10 marks. Faculty may adopt innovative methods for conducting quizzes effectively. The number of quizzes may be more than three (conduct additional quizzes and take best three). The three tests are conducted for 50 marks each and the average of all the tests are calculated for 50. The marks for the assignments are 20 (2 assignments for 10 marks each). The marks obtained in test, quiz and assignment are added to get marks out of 100 and report CIE for 50 marks.

Semester End Examination (SEE):

Total marks: 50+50=100

SEE for 50 marks is executed by means of an examination. The Question paper for each course contains two parts, Part – A and Part – B. Part – A consists of objective type questions for 20 marks covering the entire syllabus. Part – B Students have to answer five questions, one from each unit for 16 marks adding up to 80 marks. Each main question may have a maximum of three sub divisions. Each unit will have internal choice in which both questions cover entire unit having same complexity in terms of COs and Bloom's taxonomy level.

CO-PO/PSO Mapping

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	3	3	1	-	-	-	-	-	-	-	-	3	1	-
CO2	3	3	1	-	-	-	-	-	-	-	-	3	3	-
CO3	3	3	1	2	-	-	-	-	-	1	-	3	1	-
CO4	3	3	3	3	-	-	-	2	2	2	-	3	2	2
CO5	3	3	3	3	-	-	2	2	3	2	-	3	1	-

High-3, Medium-2, Low-1

Semester: VI		
MACHINE LEARNING AND LAB (Theory and Practice)		
Course Code:	MVJ21CS62	CIE Marks:50+50
Credits:	4	SEE Marks: 50 +50

Hours:		SEE Duration: 03+03 Hours
Course (Theory) Learning Objectives: The students will be able to		
1	Define machine learning and problems relevant to machine learning.	
2	Differentiate supervised, unsupervised and reinforcement learning.	
3	Apply neural networks, Bayes classifier and k nearest neighbor, for problems appear in machine learning.	
4	Perform statistical analysis of machine learning techniques.	
Course (Practice) Learning Objectives: The students will be able to		
1	Make use of Data sets in implementing the machine learning algorithms	
2	Implement the machine learning concepts and algorithms in any suitable language of choice.	

UNIT-I	
<p>Introduction: Well posed learning problems, Designing a Learning system, Perspective and Issues in Machine Learning.</p> <p>Concept Learning: Concept learning task, Concept learning as search, Find-S algorithm, Version space, Candidate Elimination algorithm, Inductive Bias.</p> <p>Laboratory Sessions/ Experimental learning: To understand purpose, give real time dataset(problem) and ask to students to solve in class room.</p> <p>Video link / Additional online information (related to module if any):</p> <ul style="list-style-type: none"> • https://www.youtube.com/watch?v=rQ3oi9g8a1Y <p>https://www.youtube.com/watch?v=h0e2HAPTGF4</p>	Hrs 8
UNIT-II	

<p>Decision Tree Learning</p> <p>Decision tree representation, Appropriate problems for decision tree learning, Basic decision tree learning algorithm, hypothesis space search in decision tree learning, Inductive bias in decision tree learning, Issues in decision tree learning.</p> <p>Laboratory Sessions/ Experimental learning:</p> <p>Ask students to design a Decision Tree using freely available dataset or problem in classroom.</p> <p>Video link / Additional online information (related to module if any):</p> <ul style="list-style-type: none"> • https://www.youtube.com/watch?v=qDcl-FRnwSU • https://www.youtube.com/watch?v=FuJVLsZYkuE 	<p>Hrs 8</p>
<p>UNIT-III</p>	
<p>Bayesian Learning and Evaluating Hypotheses</p> <p>Bayesian Learning: Introduction, Bayes theorem, Bayes theorem and concept learning, MDL principle, Naive Bayes classifier, Bayesian belief networks, EM algorithm.</p> <p>Evaluating Hypotheses: Estimating hypothesis accuracy, Basics of sampling theorem, General approach for deriving confidence intervals, Difference in error of two hypothesis</p> <p>Laboratory Sessions/ Experimental learning:</p> <p>Ask the students to build Bayes Belief Networks for real time problem in class room.</p> <p>Video link / Additional online information (related to module if any):</p> <ul style="list-style-type: none"> • https://www.youtube.com/watch?v=480a_2jRdKO • https://www.youtube.com/watch?v=E3l26bTdtxl 	<p>Hrs 8</p>
<p>UNIT-IV</p>	
<p>Artificial Neural Networks and Instance based Learning</p> <p>Artificial Neural Networks: Introduction, Neural Network representation, Appropriate problems, Perceptron, Backpropagation algorithm. Instanced Based Learning: Introduction, k-nearest neighbor learning, locally weighted regression.</p> <p>Laboratory Sessions/ Experimental learning:</p> <p>Give real time problem and ask students to design an ANN using perceptrons.</p> <p>Video link:</p>	<p>Hrs 8</p>

<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=xbYgKoG4x2g&list=PL53BE265CE4A6C056. • https://www.youtube.com/watch?v=BRMS3T11Cdw&list=PL3pGy4HtqwD2a <p>57wl7CI7tmfxfk7JWJ9Y</p>	
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UNIT-V

<p>Reinforcement Learning and Deep Learning : Reinforcement Learning: Introduction, Learning Task, Q Learning.</p> <p>Deep Learning: Introduction to Deep Learning-Reasons to go Deep Learning, Introduction to Convolution Networks ,Restricted Boltzmann Machines, Deep Belief Nets, Recurrent Nets.</p> <p>Video link:</p> <ul style="list-style-type: none"> • https://www.youtube.com/watch?v=TIIDzLZPyhY&list=PLyqSpQzTE6M_FwzHFAyf4LSkz_IjMyjD9 • https://www.youtube.com/watch?v=iOh7QUZGyiU&list=PLqYmG7hTraZDNJre23vqCGIVpfZ_K2RZs 	Hrs 8
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LABORATORY EXPERIMENTS

SL. NO.	EXPERIMENT	HRS
1	Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.	3
2	Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.	3
3	Develop a program to demonstrate the prediction of values of a given dataset using Linear regression .	3
4	Write a program to demonstrate the working of the decision tree based ID3 algorithm . Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.	3
5	Build an Artificial Neural Network by implementing the Backpropagation algorithm and test the same using appropriate data sets.	3

6	Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets.	3
7	Assuming a set of documents that need to be classified, use the naïve Bayesian Classifier model to perform this task. Built-in Java classes/API can be used to write the program. Calculate the accuracy, precision, and recall for your data set.	3
8	Write a program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set. You can use Java/Python ML library classes/API.	3
9	Apply EM algorithm to cluster a set of data stored in a .CSV file. Use the same dataset for clustering using k-Means algorithm . Compare the results of these two algorithms and comment on the quality of clustering. You can add Java/Python ML library classes/API in the program.	3
10	Write a program to implement k-Nearest Neighbour algorithm to classify the iris data set. Print both correct and wrong predictions. Java/Python ML library classes can be used for this problem.	3
11	Implement the non-parametric Locally Weighted Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.	3

Course (Theory) Outcomes: After completing the course, the students will be able to

CO1	Identify the issues in machine learning and Algorithms for solving it.
CO2	Explain theory of probability and statistics related to machine learning.
CO3	Investigate concept learning, ANN, Bayes classifier, k nearest neighbor, Q, Learning.
CO4	Identify the difference between Machine Learning and Deep Learning and using scenario
CO5	Explain the concepts of Q learning and deep learning

Course (Practice) Outcomes: After completing the course, the students will be able to

CO1	Understand the implementation procedures for the machine learning algorithms.
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CO2	Design Java/Python programs for various Learning algorithms.
CO3	Apply appropriate data sets to the Machine Learning algorithms.
CO4	Identify and apply Machine Learning algorithms to solve real world problems.
CO5	Perform statistical analysis of machine learning techniques.

Text Books	
1	Tom M. Mitchell, Machine Learning, India Edition 2013, McGraw Hill Education.
Reference Books:	
1	Trevor Hastie, Robert Tibshirani, Jerome Friedman, h The Elements of Statistical Learning, 2nd edition, springer series in statistics.
2	Ethem Alpaydın, Introduction to machine learning, second edition, MIT press.

Continuous Internal Evaluation (CIE):

Theory for 50 Marks

CIE is executed by way of quizzes (Q), tests (T) and assignments. A minimum of three quizzes are conducted along with tests. Test portion is evaluated for 50 marks and quiz is evaluated for 10 marks. Faculty may adopt innovative methods for conducting quizzes effectively. The number of quizzes may be more than three (conduct additional quizzes and take best three). The three tests are conducted for 50 marks each and the average of all the tests are calculated for 50. The marks for the assignments are 20 (2 assignments for 10 marks each). The marks obtained in test, quiz and assignment are added to get marks out of 100 and report CIE for 50 marks.

Laboratory- 50 Marks

The laboratory session is held every week as per the time table and the performance of the student is evaluated in every session. The average of the marks over number of weeks is considered for 30 marks. At the end of the semester a test is conducted for 10 marks. The students are encouraged to implement additional innovative experiments in the lab and are awarded 10 marks. Total marks for the laboratory is 50.

Semester End Examination (SEE):

Total marks: 50+50=100

SEE for 50 marks are executed by means of an examination.

The Question paper for each course contains two parts, Part – A and Part – B. Part – A consists of objective type questions for 20 marks covering the entire syllabus. Part – B Students have to answer five questions, one from each unit for 16 marks adding up to 80 marks. Each main question may have a maximum of three sub divisions. Each unit will have internal choice in which both questions cover entire unit having same complexity in terms of COs and Bloom’s taxonomy level.

Laboratory- 50 Marks

Experiment Conduction with proper results is evaluated for 40 marks and Viva is for 10 marks. Total SEE for laboratory is 50 marks.

CO-PO/PSO Mapping (Theory)														
CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	1	-	-	-	-	-	-	2	-	-
CO2	3	3	3	-	-	-	-	-	1	-	1	2	1	-
CO3	2	2	2	1	3	-	-	-	-	-	1	3	-	1
CO4	3	2	3	-	-	-	-	-	-	2	3	2	-	-
CO5	3	2	3	-	-	-	-	-	-	2	3	2	2	-

CO-PO/PSO Mapping														
CO/P O	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	-	-	-	-	-	-	2	-	1	2	-
CO2	2	1	1	-	-	-	-	-	-	2	-	1	1	3
CO3	2	1	1	-	-	-	-	-	-	2	-	1	1	2
CO4	2	1	1	-	-	-	-	-	-	2	-	1	1	1
CO5	2	1	1	-	-	-	-	-	-	2	-	1	1	3

High-3, Medium-2, Low-1

Semester: VI		
CRYPTOGRAPHY AND NETWORK SECURITY AND LAB (Theory and Practice)		
Course Code:	MVJ21CS63	CIE Marks:50+50
Credits:	4	SEE Marks: 50 +50
Hours:		SEE Duration: 03+03 Hours
Course (Theory) Learning Objectives: The students will be able to		
1	Acquire fundamental knowledge on the concepts of finite fields and number theory.	
2	To gain various block cipher and stream cipher models.	
3	Describe the principles of public key cryptosystems, hash functions and digital signature.	

4	Learn the various malicious attacks and firewall applications.
5	To develop various security protocols for web and email applications
Course (Practice) Learning Objectives: The students will be able to	
1	Compare and contrast symmetric and asymmetric encryption systems and their vulnerability to various attacks.
2	Learn the various number theory concepts and applications.
3	Analyse the message digest algorithms and create digest values.
4	To develop and apply authentication, email security, web security services and mechanisms
5	Create java script for web applications for providing security.

UNIT-I	
<p>INTRODUCTION & NUMBER THEORY: Services, Mechanisms and attacks- Classical Encryption techniques (Symmetric cipher model, substitution techniques, transposition techniques. finite fields and number theory: Groups, Rings, Fields- Modular arithmetic- Euclid's algorithm-Finite fields- Polynomial Arithmetic –Prime numbers-Fermat's and Euler's theorem- Testing for primality -The Chinese remainder theorem.</p> <p>Applications: Developing cryptographic algorithms</p> <p>Video link / Additional online information (related to module if any):</p> <ul style="list-style-type: none"> • https://www.cc.gatech.edu/~echow/ipcc/hpc-course/ • https://nptel.ac.in/courses/111/103/111103020/ 	Hrs 8
UNIT-II	
<p>BLOCK CIPHERS & PUBLIC KEY CRYPTOGRAPHY: Data Encryption Standard-Block cipher principles-block cipher modes of operation-Advanced Encryption Standard (AES)-Blowfish-RC5 algorithm. Public key cryptography: Principles of public key cryptosystems-The RSA algorithm-Key management - Diffie Hellman Key exchange-Elliptic curve arithmetic-Elliptic curve cryptography.</p> <p>Applications: Online transactions</p> <p>Video link / Additional online information (related to module if any):</p> <ul style="list-style-type: none"> • http://www.infocobuild.com/education/audio-video-courses/computer-science/IntroductionToCryptography-Ruhr/lecture-08.html 	Hrs 8

<ul style="list-style-type: none"> • https://www.comparitech.com/blog/information-security/diffie-hellman-key-exchange/ 	
UNIT-III	
<p>HASH FUNCTIONS AND DIGITAL SIGNATURES:Authentication requirement – Authentication function – MAC – Hash function – Security of hash function and MAC –MD5 - SHA - HMAC – CMAC - Digital signature and authentication protocols – DSS – ElGamal.</p> <p>Applications: Cyber forensic</p> <p>Video link / Additional online information (related to module if any):</p> <ul style="list-style-type: none"> • https://www.educba.com/md5-algorithm/ • https://www.tutorialspoint.com/cryptography/cryptography_digital_signatures.htm 	Hrs 8
UNIT-IV	
<p>SECURITY PRACTICE & SYSTEM SECURITY: Authentication applications – Kerberos – X.509 Authentication services - Internet Firewalls for Trusted System: Roles of Firewalls – Firewall related terminology- Types of Firewalls - Firewall designs - SET for E-Commerce Transactions. Intruder – Intrusion detection system – Virus and related threats – Countermeasures.</p> <p>Applications: Antivirus / Malware detecting software</p> <p>Video link / Additional online information (related to module if any):</p> <ul style="list-style-type: none"> • https://www.simplilearn.com/what-is-kerberos-article • https://searchsecurity.techtarget.com/feature/The-five-different-types-of-firewalls 	Hrs 8
UNIT-V	
<p>E-MAIL & IP SECURITY: E-mail Security: Security Services for E-mail-attacks possible through E-mail - establishing keys privacy-authentication of the source-Message Integrity-Non-repudiation-Pretty Good Privacy-S/MIME. IPSecurity: Overview of IPsec - IP and IPv6-Authentication Header-Internet Key Exchange (Phases of IKE, ISAKMP/IKE Encoding).</p> <p>Applications: Email and Banking applications</p> <p>Video link / Additional online information (related to module if any):</p> <ul style="list-style-type: none"> • https://www.barracuda.com/glossary/email-security 	Hrs 8

- <https://www.youtube.com/watch?v=ubHZQrECeew>

LABORATORY EXPERIMENTS

S. NO.	EXPERIMENT	Hrs
1	Write a program that contains a string (char pointer) with a value \Hello World'. The program should XOR each character in this string with 0 and displays the result.	3
2	Write a program that contains a string (char pointer) with a value \Hello World'. The program should AND or and XOR each character in this string with 127 and display the result.	3
3	Write a Java program to perform encryption and decryption using the following algorithms: a) Ceaser Cipher b) Substitution Cipher c) Hill Cipher.	3
4	Write a Java program to implement the DES algorithm logic.	3
5	Write a C/JAVA program to implement the BlowFish algorithm logic.	3
6	Write a C/JAVA program to implement the Rijndael algorithm logic.	3
7	Using Java Cryptography, encrypt the text "Hello world" using BlowFish. Create your own key using Java key tool.	3
8	Write a Java program to implement RSA Algorithm with p=3, q=11.	3
9	Implement the Diffie-Hellman Key Exchange mechanism using HTML and JavaScript. Consider the end user as one of the parties (Alice) and the JavaScript application as other party (bob).	3
10	Calculate the message digest of a text using the MD5 algorithm in JAVA.	3
11	Calculate the message digest of a text using the SHA-1 algorithm in JAVA.	3
	<p>OPEN ENDED EXPERIMENT</p> <p>1. Perform encryption and decryption using mono-alphabetic cipher. The program should support the following :</p>	

	<ul style="list-style-type: none"> ○ Construct an input file named plaintext.txt (consisting of 1000 alphabets, without any space or special characters) ○ Encrypt the characters of plaintext.txt and store the corresponding ciphertext characters in ciphertext.txt ○ Compute the frequency of occurrence of each alphabet in both plaintext.txt and ciphertext.txt and tabulate the results <p>2. Write a program to perform the following using Playfair cipher technique</p> <ul style="list-style-type: none"> ○ Encrypt a given message M with different keys {k1,k2,...,kn}. Print key and cipher text pair <p>Decrypt the cipher texts obtained in (i) to get back M</p>		
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Course (Theory) Outcomes: After completing the course, the students will be able to

CO1	Implement number theory for various identified attacks.
CO2	Design and develop the public key cryptographic algorithms.
CO3	Develop the digital signature and hashing algorithms
CO4	Design a firewall for detecting malicious attacks.
CO5	Design the protocols for improving security on email, web and IP.

Course (Practice) Outcomes: After completing the course, the students will be able to

CO1	Identify the major types of threats to information security and the associated attacks, Services and Mechanisms
CO2	Design and develop cryptographic algorithms using public key cryptography.
CO3	Generate the own key for developing cryptography algorithms.
CO4	Implement the key exchange algorithms using scripts.
CO5	Design the various security protocols for web applications.

Text Books

1	William Stallings, Cryptography and Network Security, 6th Edition, Pearson Education,
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	March 2013.
2	Charlie Kaufman, Radia Perlman and Mike Speciner, "Network Security", Prentice Hall of India, 2002.
3	Behrouz A. Ferouzan, "Cryptography & Network Security", Tata Mc Graw Hill, 2007.
Reference Books:	
1	Man Young Rhee, "Internet Security: Cryptographic Principles", "Algorithms and Protocols", Wiley Publications, 2003.
2	Charles Pfleeger, "Security in Computing", 4th Edition, Prentice Hall of India, 2006.
3	Ulysess Black, "Internet Security Protocols", Pearson Education Asia, 2000.

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CO3	2	3	1	3	-	1	1	1	-	1	-	2	2	1
CO4	3	2	2	1	-	2	-	-	-	-	2	1	2	2
CO5	2	2	3	3	-	1	2	1	2	-	1	2	2	2

CO-PO/PSO Mapping (Practical)														
CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO11	PO 12	PSO 1	PSO2
CO1	2	2	1	-	-	-	-	-	-	1	-	1	-	-
CO2	1	1	2	-	-	-	-	-	-	2	-	1	1	2
CO3	2	2	1	-	-	-	-	-	-	1	-	1	-	3
CO4	2	1	1	-	-	-	-	-	-	2	-	1	-	3
CO5	2	2	1	-	-	-	-	-	-	2	-	1	1	2

High-3, Medium-2, Low-1

Semester: VI		
PYTHON PROGRAMMING (Theory)		
Course Code:	MVJ21CS641	CIE Marks:50
Credits:	3	SEE Marks: 50
Hours:		SEE Duration: 3 Hrs
Course Learning Objectives: The students will be able to		

1	Familiarize the students with the fundamentals and programming basics of Python Language
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UNIT-I	
<p>Prerequisites: Knowledge of C Programming is required</p> <p>Introduction to Python: Features of python, Applications of python, Syntax, Comments, Indentations, Number types, Variables and Data Types, Operators, conditional statement, Loops in Python.</p> <p>Python List: Create Python List, Access Python List, Slicing a Python List, slicing and dicing, Reassigning a Python List (Mutable), Reassigning the whole Python list, Deleting list and elements, Multidimensional Lists, List Operations, Built-in List Functions.</p>	Hrs 8
UNIT-II	
<p>Python Tuple: Create a Python Tuple, Tuples Packing, Tuples Unpacking, creating a tuple with a single item, Access Python Tuple, slicing a Tuple, Deleting a Python Tuple, Reassigning Tuples, Tuple Functions Tuple Operations.</p> <p>Python Dictionary: Create a Dictionary, Dictionaries with mixed keys, access a Python Dictionary, Delete Python Dictionary, In-Built Functions on a Python Dictionary, In-Built Methods on a Python Dictionary, Dictionary Operations.</p>	Hrs 8
UNIT-III	
<p>Python Function: User-Defined Functions in Python, Python Built-in Functions, Python Lambda Expressions, Recursion Function, Range function.</p> <p>Python Method: Introduction to Method, <code>__init__()</code>, Self-Parameter, Functions vs Method, Magic Methods.</p>	Hrs 8
UNIT-IV	
<p>Python Class: Introduction to Python Class, defining a Python Class, Accessing Python Class Members Python Object Attributes Belonging to Python Class, Delete Python Class, Attribute, Inheritance, Multiple inheritance.</p>	Hrs 8
UNIT-V	
<p>File Handling In Python: Read and Write File, Open File, Close File, File Methods, Data Base connections.</p>	Hrs 8

Course Outcomes: After completing the course, the students will be able to

CO1	Understand data types (like character strings, integers, and real numbers) and the Operations that can be Applied to each data type.
CO2	Write programs that get input, perform calculations, and provide output (using Conditional logic, loops, Functions).
CO3	Write well designed and well documented programs that are easily maintainable
CO4	Analyze String Formatting Options.
CO5	Enjoy the art and science of computer files using python.

Text Books:

1	Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser Data Structures and Algorithms in Python John Wiley & Sons, Incorporated.
2	Frank Kane (2017) Hands-On Data Science and Python Machine Learning 1st Edition, Kindle Edition.

Reference Books

1.	Mark Smart, (2018), Introduction to Data Science with Python: Basics of Numpy and Pandas.
2.	VK Jain, Data Science & Analytics, Khanna Book Publishing ; edition (2018)

Continuous Internal Evaluation (CIE):

Theory for 50 Marks

CIE is executed by way of quizzes (Q), tests (T) and assignments. A minimum of three quizzes are conducted along with tests. Test portion is evaluated for 50 marks and quiz is evaluated for 10 marks. Faculty may adopt innovative methods for conducting quizzes effectively. The number of quizzes may be more than three (conduct additional quizzes and take best three). The three tests are conducted for 50 marks each and the average of all the tests are calculated for 50. The marks for the assignments are 20 (2 assignments for 10 marks each). The marks obtained in test, quiz and assignment are added to get marks out of 100 and report CIE for 50 marks.

Semester End Examination (SEE):

Total marks: 50+50=100

SEE for 50 marks is executed by means of an examination. The Question paper for each course contains two parts, Part – A and Part – B. Part – A consists of objective type questions for 20 marks covering the entire syllabus. Part – B Students have to answer five questions, one from each unit for 16 marks adding up to 80 marks. Each main question may have a maximum of three sub divisions. Each unit will have internal choice in which both questions cover entire unit having same complexity in terms of COs and Bloom’s taxonomy level.

High-3, Medium-2, Low-1

CO-PO/PSO Mapping														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO12	PSO 1	PS O2
CO1	3	3	2	2	-	-	-	-	-	-	-	1	2	-
CO2	3	3	2	2	-	-	-	-	-	-	-	1	2	-
CO3	3	3	3	2	-	-	-	-	-	-	-	1	2	-
CO4	3	3	2	2	-	-	-	-	-	-	-	1	2	-
CO5	3	3	3	2	-	-	-	-	-	-	-	1	1	2

Semester: VI		
WEB TECHNOLOGIES		
(Theory)		
Course Code:	MVJ21CS642	CIE Marks:50
Credits:	3	SEE Marks: 50
Hours:		SEE Duration: 3 Hrs
Course Learning Objectives: The students will be able to		

1	Understand different Internet Technologies.
2	Learn java-specific web services architecture
3	Understand the SQL and JDBC
4	Learn the AJAX and JSON

UNIT-I	
<p>Website Basics, HTML5, CSS 3, Web 2.0: Web Essentials: Clients, Servers and Communication ,The Internet, Basic Internet protocols, World wide web, HTTP Request Message , HTTP Response Message, Web Clients, Web Servers, HTML5 : Tables, Lists, Image, HTML5 control elements , Semantic elements , Drag and Drop, Audio, Video controls, CSS3: Inline, embedded and external style sheets, Rule cascading, Inheritance, Backgrounds, Border Images, Colours, Shadows, Text, Transformations</p> <p>Laboratory Sessions/ Experimental learning:</p> <ol style="list-style-type: none"> 1. Design HTML form for keeping student record. 2. Write a HTML code to generate following output. Create an html page with following specifications <ol style="list-style-type: none"> a. Title should be about my college b. Put the image in the background c. Place your college name at the top of the page in large text followed by address in smaller size d. Add names of courses offered each in a different color, style and typeface e. Add scrolling text with a message of your choice <p>Video link / Additional online information:</p> <ul style="list-style-type: none"> • https://www.youtube.com/watch?v=QEtWL4IWIL4 • https://www.youtube.com/watch?v=h_RftxdJTzs 	Hrs 8
UNIT-II	
<p>Client side Programming: An Introduction to java Script, JavaScript DOM Model, Date and Object, Regular Expression, Exception Handling, Validation, Built-in Objects, Event Handling, DHTML with JavaScript, JSON introduction, Syntax, Function Files, Http Request, SQL.</p>	Hrs 8

Laboratory Sessions/ Experimental learning:

1. Write a JavaScript to design a simple calculator to perform the following operations: sum, product, difference and quotient.
2. Write a JavaScript code that displays text "TEXT-GROWING" with increasing font size in the interval of 100ms in RED COLOR, when the font size reaches 50pt it displays "TEXT-SHRINKING" in BLUE color. Then the font size decreases to 5pt.

Video link / Additional online information:

- <https://www.youtube.com/watch?v=uDwSnnhl1Ng&list=PLsyeobzWxl7qtP8Lo9TReqUMkiOp446cV>
- <https://www.youtube.com/watch?v=zPTY1hKq3SU&list=PLVIQHNRlFIP-ByWEVjCZAj79kJdshKQwu>

UNIT-III

Server Side Programming: Java Servlet Architecture, Servlet Life Cycle, Form GET and POST actions, Session handling, Installing and Configuring Apache Tomcat Web Server, Database Connectivity: JDBC perspectives, JDBC Program Example, JSP: Understanding Java server page, JSP Standard Tag Library (JSTL), Creating HTML form using JSP Code.

**Hr
s
8**

Laboratory Sessions/ Experimental learning:

1. Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and pwd4 respectively. Write a servlet for doing the following.
 - a. Create a Cookie and add these four user id's and passwords to this Cookie.
 - b. Read the user id and passwords entered in the Login form and authenticate with the values available in the cookies.
2. Write a JSP which insert the details of the 3 or 4users who register with the web site by using registration form. Authenticate the user when he submits the login form using the user name and password from the database.

Video link / Additional online information:

- https://www.youtube.com/watch?v=7TOmdDJc14s&list=PLsyeobzWxl7pUPF2xjjJiG4BKC9x_GY46
- <https://www.youtube.com/watch?v=xve6QEgIR-0&list=PL0zysOfIRCeI5BSXoslpfDawe8FyyOSZb>

- <https://www.youtube.com/watch?v=0pzR2FGTEhk>

UNIT-IV

PHP: Introduction to PHP, PHP using PHP, Variables, Program Control, Built-in Functions, Form Validation, Basic command with PHP examples, Connection to server, creating Database, Selecting Database, Listing Database, listing table names
Creating a table, Inserting data, deleting data and tables, altering tables.

Hrs
8

Laboratory Sessions/ Experimental learning:

1. Write a PHP program to keep track of the number of visitors visiting the web page and to display this count of visitors, with proper headings.
2. Write a PHP program to display a digital clock which displays the current time of the server.
3. Write a PHP program to sort the student records which are stored in the database using selection sort.
4. Design an XML document to store information about a student in an engineering college affiliated to VTU. The information must include USN, Name, and Name of the College, Branch, Year of Joining, and email id. Make up sample data for 3 students. Create a CSS style sheet and use it to display the document.

Video link / Additional online information :

- <https://www.youtube.com/watch?v=itRkLa2kq6w>
- <https://www.youtube.com/watch?v=KJHYdkKtafU>
- https://www.youtube.com/watch?v=G_CFRAdbXfl&list=PL_RGaFnxSHWrjk_pK2zD4TWKWMWVfeYK-b

UNIT-V

AJAX: Ajax client server architecture, Xml HTTP request object, Call back methods. Advanced JavaScript and jQuery, JavaScript Pseudo-Classes, jQuery Foundations, Web Services: Introduction, Java web services Basics, Creating, Publishing, Testing and Describing a web services, Database driven web service from an application.

Hrs
8

Laboratory Sessions/ Experimental learning:

1. Creating simple application to access data base using JDBC Formatting HTML with CSS.

2. Write a Program for manipulating Databases and SQL with real time application.
3. Write a Java applet to display the Application Program screen i.e. calculator and other.

Video link / Additional online information

- <https://www.youtube.com/watch?v=qk9MWbyRIhE>
- <https://www.youtube.com/watch?v=0pzR2FGTEhk>
- <https://www.youtube.com/watch?v=HgvIox6ehkM>

Course Outcomes: After completing the course, the students will be able to

CO1	Construct a basic website using HTML and Cascading Style Sheets.
CO2	Build dynamic web page with validation using Java Script objects and by applying different event handling mechanism.
CO3	Develop server side programs using Servlets and JSP.
CO4	Construct simple web pages in PHP and to represent data in XML format.
CO5	Use AJAX and web services to develop interactive web applications.

Text Books:

1	Deitel and Deitel and Nieto, Internet and World Wide Web, How to Program, Prentice Hall, 5th Edition, 2011.
2	Randy Connolly, Ricardo Hoar, "Fundamentals of Web Development", 1st Edition, Pearson Education India. (ISBN:978-9332575271)

Reference Books

1.	Stephen Wynkoop and John Burke –Running a Perfect Website , QUE, 2nd Edition, 1999
2.	Chris Bates, Web Programming – Building Intranet Applications, 3rd Edition, Wiley Publications, 2009.
3.	UttamK.Roy, –Web Technologies , Oxford University Press, 2011.

Continuous Internal Evaluation (CIE):

Theory for 50 Marks

CIE is executed by way of quizzes (Q), tests (T) and assignments. A minimum of three quizzes are conducted along with tests. Test portion is evaluated for 50 marks and quiz is evaluated for 10 marks. Faculty may adopt innovative methods for conducting quizzes effectively. The number of quizzes may be more than three (conduct additional quizzes and take best three). The three tests are conducted for 50 marks each and the average of all the tests are calculated

for 50. The marks for the assignments are 20 (2 assignments for 10 marks each). The marks obtained in test, quiz and assignment are added to get marks out of 100 and report CIE for 50 marks.

Semester End Examination (SEE):

Total marks: 50+50=100

SEE for 50 marks is executed by means of an examination. The Question paper for each course contains two parts, Part – A and Part – B. Part – A consists of objective type questions for 20 marks covering the entire syllabus. Part – B Students have to answer five questions, one from each unit for 16 marks adding up to 80 marks. Each main question may have a maximum of three sub divisions. Each unit will have internal choice in which both questions cover entire unit having same complexity in terms of COs and Bloom’s taxonomy level.

CO-PO/PSO Mapping														
CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO1 1	PO 12	PSO 1	PSO2
CO1	3	3	1	-	3	-	-	-	-	-	-	1	-	2
CO2	3	3	1	-	-	-	-	-	-	-	-	1	1	3
CO3	3	3	1	-	-	-	-	-	-	-	-	1	1	2
CO4	3	3	1	-	-	-	-	-	-	-	-	1	-	2
CO5	3	3	1	-	-	-	-	-	-	-	-	2	1	1

High-3, Medium-2, Low-1

Semester: VI		
OPERATING SYSTEMS		
Course Code: MVJ21CS643		CIE Marks:100
Credits: L:T:P:S: 3:0:0:0		SEE Marks: 100
Hours: 40L		SEE Duration: 3 Hrs
Course Learning Objectives: The students will be able to		
1	Introduce concepts and terminology used in OS.	
2	Explain threading and multithreaded systems.	
3	Illustrate process synchronization and concept of Deadlock.	
4	Introduce Memory and Virtual memory management, File system and storage techniques.	

UNIT-I

<p>Introduction: What operating systems do; Computer System organization; Computer System architecture; Operating System operations; Distributed system; Special-purpose systems; Computing environments. Operating System Services; User - Operating System interface; System calls; Types of system calls; System programs; Operating system design and implementation; Operating System structure; Virtual machines; System boot.</p> <p>Process Management: Process concept; Process scheduling; Operations on processes; Inter process communication.</p>	8 Hrs
UNIT-II	
<p>Multi-threaded Programming: Overview; Multithreading models; Thread Libraries; Threading issues. Process Scheduling: Basic concepts; Scheduling Criteria; Scheduling Algorithms; Multiple-processor scheduling; Thread scheduling.</p> <p>Process Synchronization: Synchronization: The critical section problem; Peterson's solution; Synchronization hardware; Semaphores; Classical problems of synchronization; Monitors.</p>	8 Hrs
UNIT-III	
<p>Deadlocks: Deadlocks; System model; Deadlock characterization; Methods for handling deadlocks; Deadlock prevention; Deadlock avoidance; Deadlock detection and recovery from deadlock.</p> <p>Memory Management: Memory management strategies: Background; Swapping; Contiguous memory allocation; Paging; Structure of page table; Segmentation</p>	8 Hrs
UNIT-IV	
<p>Virtual Memory Management: Background; Demand paging; Copy-on-write; Page replacement; Allocation of frames; Thrashing.</p> <p>File System, Implementation of File System: File system: File concept; Access methods; Directory structure; File system mounting; File sharing;</p> <p>Implementing File system: File system structure; File system implementation; Directory implementation; Allocation methods; Free space management.</p>	8 Hrs
UNIT-V	
<p>Mass Storage Structure-Disk Structure - Disk Attachment-Disk Scheduling-Disk Management- Swap-Space Management.</p> <p>Protection: Domain of protection, Access matrix, Implementation of access matrix, Access control, Revocation of access rights, Capability- Based systems.</p> <p>Case Studies: Windows, Unix, Linux, Android.</p>	8 Hrs

CO1	2	2	2	-	-	-	-	-	-	-	-	-
CO2	2	2	3	-	-	-	-	-	-	-	-	-
CO3	3	2	3	-	-	-	-	-	-	-	-	-
CO4	3	2	3	-	-	-	-	-	-	-	-	-
CO5	3	2	3	-	-	-	-	-	-	-	-	-

High-3, Medium-2, Low-1

Semester: VI		
MOBILE APPLICATION DEVELOPMENT		
Course Code:	MVJ21CS644	CIE Marks:50
Credits:	3	SEE Marks: 50
Hours:		SEE Duration: 3 Hrs
Course Learning Objectives: The students will be able to		
1	Demonstrate their understanding of the fundamentals of Android operating systems	
2	Demonstrate their skills of using Android software development tools	
3	Familiarize engineering practices and standards used in developing software products and components.	
4	Demonstrate their ability to develop software with reasonable complexity on mobile platform	

UNIT-I	
<p>Introduction to Android Operating System: Android OS design and Features – Android development framework, SDK features, Installing and running applications on Eclipse platform, Creating AVDs, Types of Android applications, best practices in Android programming, Android tools. Android application components – Android Manifest file, Externalizing resources like values, themes, layouts, Menus etc, Android Application Lifecycle – Activities, Activity lifecycle, activity states, monitoring state changes</p> <p>Video link / Additional online information (related to module if any):</p> <p>2. https://www.youtube.com/watch?v=deq8mkt_cxQ</p>	Hrs 8
UNIT-II	
<p>Android User Interface: Measurements – Device and pixel density independent measuring units Layouts – Linear, Relative, Grid and Table Layouts User Interface (UI) Components – Editable and non editable Text Views, Buttons, Radio and Toggle Buttons, Checkboxes, Spinners, Dialog and</p>	Hrs 8

<p>pickers Event Handling – Handling clicks or changes of various UI components</p> <p>Fragments – Creating fragments, Lifecycle of fragments, Fragment states, Adding fragments to Activity, adding, removing and replacing fragments with fragment transactions, interfacing between fragments and Activities, Multi-screen Activities</p> <p>Applications: Design a Simple Calculator App</p> <p>Video link / Additional online information (related to module if any):</p> <p>2. https://www.youtube.com/watch?v=PJ3RdfJ4Np8</p>	
<p>UNIT-III</p>	
<p>Intents and Broadcasts: Intent – Using intents to launch Activities, explicitly starting new Activity, Implicit Intents, passing data to Intents, getting results from Activities, Native Actions, using Intent to dial a number or to send SMS</p> <p>Broadcast Receivers – Using Intent filters to service implicit Intents, Resolving Intent filters, finding and using Intents received within an Activity Notifications – Creating and Displaying notifications, Displaying Toast.</p> <p>Video link / Additional online information (related to module if any):</p> <ul style="list-style-type: none"> • https://nptel.ac.in/courses/106/106/106106147/ 	<p>Hrs 8</p>
<p>UNIT-IV</p>	
<p>Persistent Storage: Files – Using application specific folders and files, creating files, reading data from files, listing contents of a directory Shared Preferences – Creating shared preferences, saving and retrieving data using Shared Preference Database – Introduction to SQLite database, creating and opening a database, creating tables, inserting retrieving and deleting data, Registering Content Providers, Using content Providers (insert, delete, retrieve and update)</p> <p>Video link / Additional online information (related to module if any):</p> <ul style="list-style-type: none"> • http://developer.android.com/develop/index.htm 	<p>Hrs 8</p>
<p>UNIT-V</p>	
<p>Advanced Topics: Alarms – Creating and using alarms Using Internet Resources – Connecting to internet resource, using download manager Location Based Services – Finding Current Location and showing location on the Map, updating location</p>	<p>Hrs 8</p>

Video link / Additional online information (related to module if any):	
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2. https://www.codeschool.com/learn/ios	
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Course Outcomes: After completing the course, the students will be able to	
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CO1	Understand the fundamentals of Android operating systems
CO2	Understand various layouts and designing UI.
CO3	Understand major Android components intents, broadcasting and notifications.
CO4	Understand basic concepts of SQLite database.
CO5	Understand how to utilize Location based services.

Text Books	
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- | | |
|----|--|
| 4. | Charlie Collins, Michael Galpin and Matthias Kappler, "Android in Practice", DreamTech, 2012 |
| 5. | David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, "Beginning iOS 6 Development: Exploring the iOS SDK", Apress, 2013. |
| 6. | Google Developer Training, "Android Developer Fundamentals Course – Concept Reference", Google Developer Training Team, 2017. |

Reference Books:	
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- | | |
|----|---|
| 1. | James Dovey and Ash Furrow, "Beginning Objective C", Apress, 2012 |
| 2. | Jeff McWhorter and Scott Gowell, "Professional Mobile Application Development", Wrox, 2012. |

Continuous Internal Evaluation (CIE):

Theory for 50 Marks

CIE is executed by way of quizzes (Q), tests (T) and assignments. A minimum of three quizzes are conducted along with tests. Test portion is evaluated for 50 marks and quiz is evaluated for 10 marks. Faculty may adopt innovative methods for conducting quizzes effectively. The number of quizzes may be more than three (conduct additional quizzes and take best three). The three tests are conducted for 50 marks each and the average of all the tests are calculated for 50. The marks for the assignments are 20 (2 assignments for 10 marks each). The marks obtained in test, quiz and assignment are added to get marks out of 100 and report CIE for 50 marks.

Semester End Examination (SEE):

Total marks: 50+50=100

SEE for 50 marks is executed by means of an examination. The Question paper for each course contains two parts, Part – A and Part – B. Part – A consists of objective type questions for 20 marks covering the entire syllabus. Part – B Students have to answer five questions, one from each unit for 16 marks adding up to 80 marks. Each main question may have a maximum of three sub divisions. Each unit will have internal choice in which both questions cover entire unit having same complexity in terms of COs and Bloom’s taxonomy level.

CO-PO/PSO Mapping														
CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO11	PO 12	PSO 1	PSO2
CO1	3	3	1	-	-	-	-	-	-	-	-	3	1	-
CO2	3	3	1	-	-	-	-	-	-	-	-	3	3	-
CO3	3	3	1	2	-	-	-	-	-	1	-	3	1	-
CO4	3	3	3	3	-	-	-	2	2	2	-	3	2	2
CO5	3	3	3	3	-	-	2	2	3	2	-	3	1	-

High-3, Medium-2, Low-1

Semester: VI		
NATURAL LANGUAGE PROCESSING		
Course Code:	MVJ21CS645	CIE Marks:50
Credits:	3	SEE Marks: 50
Hours:		SEE Duration: 3 Hrs
Course Learning Objectives: The students will be able to		
1	Learn the fundamentals of natural language processing.	
2	Understand the use of CFG and PCFG in NLP.	
3	Understand the role of semantics of sentences and pragmatics.	
4	Gain knowledge in automated Natural Language Generation and Machine Translation.	

UNIT-I	
<p>INTRODUCTION: Origins and challenges of NLP – Language Modelling: Grammar-based LM, Statistical LM –Regular Expressions, Finite-State Automata – English Morphology, Transducers forlexicon and rules, Tokenization, Detecting and Correcting Spelling Errors, Minimum EditDistance values of real symmetric matrices: Jacobi and Givens method.</p> <p>Laboratory Session: Word Analysis</p> <p>Applications: Text to Speech conversion</p> <p>Video link : https://nptel.ac.in/courses/106/105/106105158/</p>	Hrs 8

UNIT-II	
<p>WORD LEVEL AND SYNTACTIC ANALYSIS: Ngrams Models of Syntax - Counting Words - Unsmoothed Ngrams-Smoothing-Back off Deleted Interpolation – Entropy – English Word Classes - Tag sets for English-Part of Speech Tagging-RuleBased Part of Speech Tagging - Stochastic Part of Speech Tagging - Transformation-Based Tagging -Issues in PoS tagging – Hidden Markov and Maximum Entropy models.</p> <p>Laboratory Session: Morphological Analyzer for a given word</p> <p>Applications: Speech to text conversion</p> <p>Video link : https://nptel.ac.in/courses/106/105/106105158/</p>	Hrs 8
UNIT-III	
<p>CONTEXT FREE GRAMMARS: Context-Free Grammars, Grammar rules for English, Tree banks, Normal Forms for grammar – Dependency Grammar – Syntactic Parsing, Ambiguity, Dynamic Programming parsing – Shallow parsing Probabilistic CFG, Probabilistic CYK, Probabilistic Lexicalized CFGs – Feature structures, Unification of feature structures</p> <p>Laboratory Sessions: Chunking for a given sentence</p> <p>Applications: Compiler</p> <ul style="list-style-type: none"> • Video link : https://www.youtube.com/watch?v=6b40kKe2SFg 	Hrs 8
UNIT-IV	
<p>SEMANTICS AND PRAGMATICS: Representing Meaning - Meaning Structure of Language -First Order Predicate Calculus-Representing Linguistically Relevant Concepts –SyntaxDriven Semantic Analysis - Semantic Attachments –Syntax Driven Analyzer- Robust Analysis – Lexemes and Their Senses - Internal Structure - Word Sense Disambiguation -Information Retrieval.</p> <p>Laboratory Session: Pragmatic Analysis of a given sentence</p> <p>Applications: Sentiment Analysis</p> <ul style="list-style-type: none"> • Videolink:https://www.coursera.org/lecture/humanlanguage/pragmatics-E8VXH 	Hrs 8
UNIT-V	

<p>LANGUAGE GENERATION AND DISCOURSE ANALYSIS: Discourse segmentation, Coherence – Reference Phenomena, Anaphora Resolution using Hobbs and Centering Algorithm – Co reference Resolution – Resources: Porter Stemmer, Lemmatize, Penn Treebank, Brill’s Tagger, Word Net, Prop Bank, Frame Net, Brown Corpus, and British National Corpus (BNC).</p> <p>Laboratory Session: Sentiment analysis on movie database</p> <p>Applications: Sentiment analysis</p> <p>Videolink: https://www.coursera.org/lecture/text-mining-analytics/5-6-how-to-do-sentiment-analysis-with-sentiwordnet-5RwtX</p>	<p>Hrs 8</p>
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Course Outcomes: After completing the course, the students will be able to	
CO1	To tag a given text with basic Language features.
CO2	To design an innovative application using NLP components
CO3	To implement a rule-based system to tackle morphology/syntax of a language
CO4	To design a tag set to be used for statistical processing for real-time applications
CO5	To compare the use of different statistical approaches for different types of NLP applications

Text Books	
1	Daniel Jurafsky, James H. Martin–Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech, Pearson Publication, 2014.
2	C. Manning and H. Schutze, “Foundations of Statistical Natural Language Processing”, MIT Press. Cambridge, MA:1999

Reference Books:	
1	Steven Bird, Ewan Klein and Edward Loper, –Natural Language Processing with Python, First Edition, OReilly Media, 2009.
2	Natural Language Processing and Information Retrieval: Tanvier Siddiqui, U.S.Tiwary
3	Allen, James, Natural Language Understanding, Second Edition, Benjamin/Cumming, 1995.

**Continuous Internal Evaluation (CIE):
Theory for 50 Marks**

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Semester End Examination (SEE):

Total marks: 50+50=100

SEE for 50 marks is executed by means of an examination. The Question paper for each course contains two parts, Part – A and Part – B. Part – A consists of objective type questions for 20 marks covering the entire syllabus. Part – B Students have to answer five questions, one from each unit for 16 marks adding up to 80 marks. Each main question may have a maximum of three sub divisions. Each unit will have internal choice in which both questions cover entire unit having same complexity in terms of COs and Bloom’s taxonomy level.

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CO3	3	3	3	-	-	-	-	-	-	-	-	-	1	3
CO4	3	3	3	-	-	-	-	-	-	-	-	-	1	2
CO5	2	2	2	-	-	-	-	-	-	-	-	-	2	-

High-3, Medium-2, Low-1

Semester: VI

ANGULAR JS AND NODE JS

(Theory&Lab)

Course Code: MVJ21AEC66

CIE Marks:100

Credits: L:T:P:S: 2:0:0:0

SEE Marks: 100

Hours: 40L

SEE Duration: 3 Hrs

Course Learning Objectives: The students will be able to

- | | |
|---|---|
| 1 | To learn the basics of Angular JS. |
| 2 | To understand the Angular JS Modules |
| 3 | To implement Forms, inputs and Services |
| 4 | To implement Directives and Databases |
| 5 | To understand basics of Node JS. |

UNIT-I

Introduction To Angular JS:Introduction – Features – Angular JSModel-View-Controller – Expression -Directives and Controllers.

6 Hrs

UNIT-II

Angular JS Modules: Arrays –Working with ng-model – Working with Forms –Form Validation – Error Handling with Forms – Nested Forms with ng-form –Other Form Controls.	6 Hrs
UNIT-III	
Directives& Building Databases: Part I- Filters – Using Filters in Controllers andServices – Angular JS Services – Internal Angular JS Services – Custom Angular JS Services	6 Hrs
UNIT-IV	
Directives& Building Databases: Part-II- Directives – Alternatives to Custom Directives – Understanding the Basic options – Interacting with Server –HTTPServices – Building Database, Front End and BackEnd	6 Hrs
UNIT-V	
Introduction to NODE .JS: Introduction –Using the Terminals – Editors – Building aWebserver with Node – The HTTPModule – Views and Layouts.	6 Hrs

Course Outcomes: After completing the course, the students will be able to

CO1	Describe the features of Angular JS.
CO2	Recognize the form validations and controls.
CO3	Implement Directives and Controllers
CO4	Evaluate and create database for simple application.
CO5	Plan and build webservers with node using Node .JS.

Reference Books

1	Adam Freeman - ProAngular JS, Apress, First Edition, 2014.
2	ShyamSeshadri, Brad Green –“AngularJS: Up and Running: Enhanced Productivity with Structured Web Apps”, Apress, O'Reilly Media, Inc.
3.	AgusKurniawan–“AngularJS Programming by Example”, First Edition, PE Press, 2014.
4.	Brad Dayley, “Learning Angular JS”, Addison-Wesley Professional, First Edition, 2014.

Continuous Internal Evaluation (CIE):

Theory for 50 Marks

CIE is executed by way of quizzes (Q), tests (T) and assignments. A minimum of three quizzes are conducted along with tests. Test portion is evaluated for 50 marks and quiz is evaluated for 10 marks. Faculty may adopt innovative methods for conducting quizzes effectively. The number of quizzes may be more than three (conduct additional quizzes and take best three). The three tests are conducted for 50 marks each and the average of all the tests are calculated for 50. The marks for the assignments are 20 (2 assignments for 10 marks each). The marks obtained in test, quiz and assignment are added to get marks out of 100 and report CIE for 50 marks.

Semester End Examination (SEE):

Total marks: 50+50=100

SEE for 50 marks is executed by means of an examination. The Question paper for each course contains two parts, Part – A and Part – B. Part – A consists of objective type questions for 20 marks covering the entire syllabus. Part – B Students have to answer five questions, one from each unit for 16 marks adding up to 80 marks. Each main question may have a maximum of three sub divisions. Each unit will have internal choice in which both questions cover entire unit having same complexity in terms of COs and Bloom's taxonomy level.

CO-PO Mapping												
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	1	-	-	-	-	-	-	2
CO2	3	3	3	2	-	-	-	-	1	-	1	2
CO3	2	2	2	1	3	-	-	-	-	-	1	3
CO4	3	2	3	2	1	-	-	-	-	2	3	2
CO5	3	2	3	1	-	-	-	-	-	2	3	2

High-3, Medium-2, Low-1