SRI VENKATESWARA UNIVERSITY
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SEMESTER SYSTEM WITH CBCS
SEMESTER V
W.E.F. 2022-2023

Skill Enhancement Courses (SECs) for Semester V,

from 2022-23 *(Syllabus with Learning Outcomes, References, Co-curricular Activities)*

Structure of SECs for Semester – V

(To choose one pair from the three alternate pairs of SECs)

UnivCode	CourseNumber6 &7	Name of Course	Hours/ Week Theo+Prac	Credits Theo+Prac	Marks	
					IA –20 FiledWork05	Sem End
	6A	Web Interface Designing Technologies	3+3	3+2	25	75
	7A	Web Applications Development using PHP & MYSQL	3+3	3+2	25	75
OR						
	6B	Internet of Things	3+3	3+2	25	75
	7B	Application Development using Python	3+3	3+2	25	75
OR						
	6C	Data science	3+3	3+2	25	75
	7C	Python for Data Science	3+3	3+2	25	75

Note-1: For Semester–V, for the domain subject Computer Science **any one** of the **three** pairs of SECs shall be chosen as courses 6 and 7, i.e., 6A & 7A or 6B & 7B or 6C& 7C.Thepair shall not be broken (ABCD allotment is random, not on any priority basis).

Note-2: *One of the main objectives of Skill Enhancement Courses (SEC) is to inculcate field related skills of the domain subject in students. The syllabus of SEC will be partially skill oriented. Hence, teachers shall also impart practical training to students on the skills embedded in syllabus citing related real field situations.*

Course Code:

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SEMESTER V

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Skill Enhancement Courses (SECs) for Semester V,

from 2022-23 *(Syllabus with Learning Outcomes, References, Co-curricular Activities)*

Max Marks: 100+50

COURSE6A: WEB INTERFACE DESIGNING TECHNOLOGIES

(Skill Enhancement Course(Elective),Credits:05)

I. LearningOutcomes: Studentsaftersuccessfulcompletionofthecoursewillbeabl eto:

1. Understand and appreciate the web architecture and services.
2. Gain knowledge about various component sofa website.
3. Demonstrate skills regarding creation of a static website and an interface to dynamic website.
4. Learn how to install word press and gain the knowledge of installing various pluginstouse in their websites.

II. **Syllabus:***(Total Hours:90including Teaching, Lab, and Field training, Unit tests etc.)*

Unit-I (10 hours)

HTML : Introduction to web designing, difference between web applications anddesktopapplications,introductiontoHTML,HTMLstructure,elements,attrib utes,headings,paragraphs, styles, colours, HTML formatting, Quotations, Comments,images,tables,lists,blocksandclasses,HTMLCSS,HTMLframes,file paths,layout,symbols,HTMLresponsive.

Unit– II (10 hours)

HTMLforms:HTMLformelements,inputtypes,inputattributes,HTML5,HTMLgr aphics,HTMLmediavideo,audio,plugINS,youtube.**HTMLAPI'S:**Geolocation,Dr ag/drop,localstorage,HTMLSSE.**CSS:** CSS home, introduction, syntax, colours, background, borders, margins, padding, height/width, text, fonts, icons, tables, lists, position, over flow, float, CSS combinators, pseudo class, pseudo elements, opacity, tool tips, image gallery, CSS forms, CSS counters, CSS responsive.

Unit– III (10 hours)

Client side Validation: Introduction to JavaScript - What is DHTML, JavaScript,basics,variables,stringmanipulations,mathematicalfunctions,statements,operators,arrays,functions.ObjectsinJavaScriptDataandobjectsinJavaScript,regularexpressions,exception handling. DHTML with JavaScript- Data validation, opening a new window, messages and confirmations, the status bar, different frames, rollover buttons, moving images.

Unit– IV (10 hours)

Word press : Introduction to word press, servers like wamp, bitnami e.tc, installing and configuring word press, understanding admin panel, working with posts and pages, using editor, text formatting with shortcuts, working with media-Adding, editing, deleting media elements, working with widgets, menus.

Unit– V (10 hours)

Working with themes-parent and child themes, using featured images, configuring settings, user and user roles and profiles, adding external links, extending word press with plug-ins. Customizing the site, changing the appearance of site using css , protecting word press website from hackers.

III. References

1. ChrisBates,WebProgrammingBuildingInternetApplications,SecondEdition,Wiley(2007)
2. PaulS.WangSandaS.Katila,anIntroductiontoWebDesignplusProgramming,Thomson (2007).
3. Head FirstHTMLandCSS,ElisabethRobson,EricFreeman,O'ReillyMediaInc.
4. AnIntroductiontoHTMLandJavaScript:forScientistsandEngineers,DavidR.Brooks.Springer, 2007
5. Schaum'sEasyOutlineHTML, DavidMercer,Mcgraw HillProfessional.
6. WordpressforBeginners,Dr.AndyWilliams.
7. Professionalwordpress,BradWilliams,Daviddamstra,Hanstern.
8. Webresources:

a. http://www.codecademy.com/tracks/web
b. http://www.w3schools.com
c. https://www.w3schools.in/wordpress-tutorial/
d. http://www.homeandlearn.co.uk

9. Other web sources suggested by the teacher concerned and the college librarian including reading material.

IV. Co-CurricularActivities

a) **Mandatory:** *(Training of students by teacher in field related skills : (lab: 10+field: 05):*

1. **For Teacher**: Field related training of students by the teacher in laboratory/field for not less than 15 hours on identifying the case study to build a website, designing the format, structure, menus, submenus etc for a web site and finally to build a website.

2. **For Student**: Students shall (individually) search online and visit any of the agencies like hotels, hospitals, super bazaars, organizations, etc. where there is a need for a website andidentifyanyonecasestudyandsubmitahand-writtenFieldwork/Projectwork/Projectwork/Projectwork/ ProjectworkReportnotexceeding10pages.Example:Choosingafirmor business to develop a website, identifying various business entities to be included in the website, identifying menu bar and content to be placed in their websites.
3. Max marks for Fieldwork/Project work/Project work / Project work/Project work / Project work Report: 05.
4. Suggested Format for Fieldwork/Project work/Project work / Project work/Project work : *Title page, student details, index page, details of place visited, observations, findings and acknowledgements*.
5. Unittests (IE).

b) Suggested Co-Curricular Activities

1. Buildawebsitewith10 pages for the case study identified.
2. Training of students by related industrial experts.
3. Assignments
4. Seminars, Group discussions, Quiz, Debatesetc.(onrelatedtopics).
5. Presentationbystudentsonbest websites.

SRI VENKATESWARA UNIVERSITY

B.Sc. DEGREE COURSE IN COMPUTER SCIENCE

V SEMESTER - W.E.F. 2022-23

COURSE6A:WEB INTERFACE DESIGNING TECHNOLOGIES

MODEL QUESTION PAPER

Time: 3 hours Marks: 75 marks

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.Part B consists of 5 Units. Answer one full question (A or B) from each unit (i.e., Q.No 9 from Unit – I, Q.No 10 from Unit – II, Q.No 11 from Unit – III, Q.No 12 from Unit – IV, Q.No 13 from Unit – V). Each question carries 10 marks.

PART – A

Answer any *Five* of the following question. (5X5=25M)

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

(P.T.O)

PART – B

Answer All The Questions. Each question carries 10 marks (5X10= 50M)

9.	(A) OR (B)
10.	(A) OR (B)
11.	(A) OR (B)
12.	(A) OR (B)
13.	(A) OR (B)

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W.E.F. 2022-2023
COURSE6A: WEB INTERFACE DESIGNING TECHNOLOGIES
PRACTICAL SYLLABUS

V. LearningOutcomes:

Onsuccessfulcompletionofthispracticalcourse, studentshallbeableto:

1. Createabasic website with thehelpof HTMLand CSS.
2. Acquirethe skill of installingword press and variousplugins ofWordpress.
3. Createastatic website with thehelpofWordpress.
4. Createaninterfacefor adynamicwebsite.
5. Applyvarious themesfortheirwebsites usingWordpress.

VI. Practical(Laboratory)Syllabus: *(30hrs.)*

HTMLandCSS:

1. CreateanHTMLdocumentwith thefollowing formattingoptions:

(a) Bold, (b) Italics, (c) Underline, (d) Headings (Using H1 to H6 heading styles),(e)Font(Type,SizeandColor),(f)Background(Coloredbackground/ Imageinbackground),(g)Paragraph,(h)LineBreak,(i)Horizontal Rule,(j) Pretag

2. CreateanHTMLdocument whichconsistsof:

(a) OrderedList(b)UnorderedList(c)NestedList (d)Image

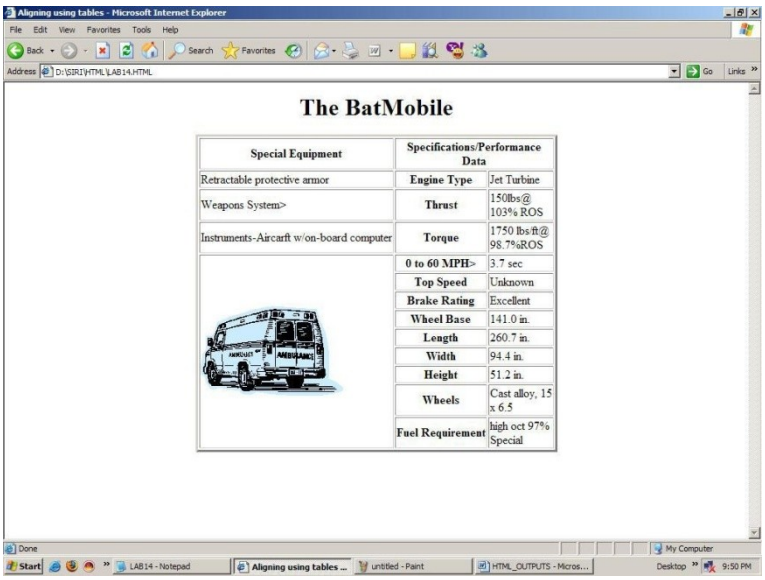
3. CreateaTable withfourrows andfivecolumns. Placeanimageinonecolumn.

4. Using“table”tag,aligntheimagesasfollows:

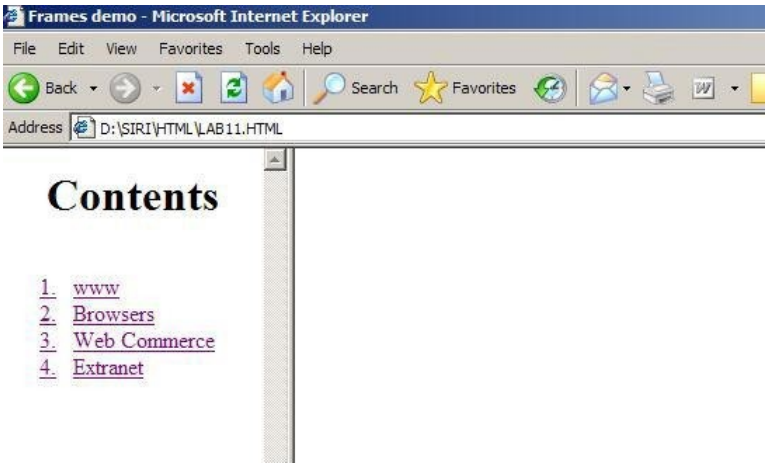
5. Createamenuformusinghtml.
6. Stylethemenu buttonsusingcss.
7. Createa form usingHTMLwhich has thefollowingtypes ofcontrols:

(a) TextBox(b)Option/radio buttons(c) Checkboxes (d)Reset andSubmit buttons

8. Embedacalendarobjectinyourwebpage.
9. Createan appletthatacceptstwonumbersand performallthearithmeticoperationson them.
10. Createnestedtabletostore yourcurriculum.
11. Createa form thataccepts theinformationfrom thesubscriberof amailingsystem.
12. Designthepage asfollows:



13. Createahelpfile asfollows:



14. Createawebpagecontainingyour biodata (assumetheformandfields).
15. Writeahtmlprogramincludingstylesheets.
16. Writeahtmlprogramtolayersofinformationinwebpage.
17. Createastaticwebpage.

Word press:

18. Installationand configurationofwordpress.
19. Create a site and add a theme to it.20Create a child theme
21. CreatefivepagesonCOVID–19andlinkthem tothehomepage..
22. Createasimplepostwithfeaturedimage.
23. Addan externalvideo link withsize640X 360.
24. Createauserandassigna roleto him.
25. Createalogin pagetoword press usingcustom links
26. Createawebsiteforyourcollege.

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SEMESTER SYSTEM WITH CBCS

SEMESTER V

W.E.F. 2022-2023

Skill Enhancement Courses (SECs) for Semester V,

from 2022-23 *(Syllabus with Learning Outcomes, References, Co-curricular Activities)*

CourseCode:
MaxMarks: 100+50

Course7A:We bApplications Development using PHP & MYSQL

(Skill Enhancement Course(Elective),Credits:05)

I. Learning Outcomes:

Students after successful completion ofthecoursewillbeableto:

1. Writesimpleprograms inPHP.
2. Understand how to use regular expressions, handle exceptions, and validate data usingPHP.
3. ApplyIn-Builtfunctions andCreate Userdefined functionsinPHPprogramming.
4. WritePHPscriptsto handleHTMLforms.
5. WriteprogramstocreatedynamicandinteractivewebbasedapplicationsusingPHPandMYSQL.
6. KnowhowtousePHPwithaMySQLdatabaseandcanwritedatabasedrivenwebpages.

II. **Syllabus:***(TotalHours:90 including Teaching, Lab, and Field training, Unit tests etc.)*

Unit-1: (10hours)

The Building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants.Flow Control Functions in PHP: Switching Flow, Loops, Code Blocks and Browser Output.Working with Functions: What is function?, Calling functions, Defining Functions, Returningthe values from User-Defined Functions, Variable Scope, Saving state between Function callswiththestatic statement, moreabout arguments.

Unit-2: (10hours)

Working with Arrays: What are Arrays? Creating Arrays, Some Array-Related Functions.Working with Objects: Creating Objects, Object Instance Working with Strings, Dates andTime: Formatting strings with PHP, Investigating Strings with PHP, Manipulating StringswithPHP, UsingDate and TimeFunctions in PHP.

Unit-3: (10hours)

Working with Forms: Creating Forms, Accessing Form Input with User defined Arrays,Combining HTML andPHP code on a single Page, Using Hidden Fields to save state,Redirecting the user, Sending Mail on Form Submission, and Working with File Uploads.Working with Cookies and User Sessions: Introducing Cookies, Setting a Cookie with PHP,Session Function Overview, Starting a Session, Working with session variables, passingsessionIDsintheQueryString,DestroyingSessionsandUnsettingVariables,UsingSessionsin an Environment with Registered Users.

Unit-4: (10hours)

Working with Files and Directories: Including Files with inclue(), Validating Files, Creatingand Deleting Files, Opening a File for Writing, Reading or Appending, Reading from Files,Writing or Appending to a File, Working with Directories,OpenPipestoandfromProcessUsingpopen(),RunningCommandswithexec(),RunningCommandswithsystem()orpassthru().Working with Images: Understanding the Image-Creation Process, Necessary Modificationsto PHP, Drawing a New Image, Getting Fancy with Pie Charts, Modifying Existing Images,ImageCreation from UserInput.

Unit-5: (10hours)

Interacting with MySQL using PHP: MySQL Versus MySQLi Functions, Connecting toMySQL with PHP, Working with MySQL Data. Creating an OnlineAddressBook:PlanningandCreatingDatabaseTables,CreatingMenu,CreatingRecordAdditionMechanism,ViewingRecords,CreatingtheRecordDeletionMechanism,AddingSub-entitiestoaRecord.

III. References

1. JulieC.Meloni,SAMSTeachyourselfPHPMySQLandApache,PearsonEd ucation(2007).
2. StevenHolzner,PHP: TheCompleteReference,McGraw-Hill
3. RobinNixon,LearningPHP,MySQL,JavaScript,CSS&HTML5,ThirdEditionO'reilly,2014
4. XueBaiMichaelEkedahl,ThewebwarriorguidetoWebProgramming,Thomson(2006).
5. Webresources:
   e. http://www.codecademy.com/tracks/php
   f. http://www.w3schools.com/PHP
   g. http://www.tutorialpoint.com

6. Otherwebsourcessuggestedbytheteacherconcernedandthecollegelibrarianincludingreadingmaterial.

IV. Co-CurricularActivities:

a) **Mandatory:** *(Trainingofstudents byteacherin fieldrelatedskills:(lab: 10+field: 05):*

1. **For Teacher**: Field related training of students by the teacher in laboratory/field for notless than 15 hours on demonstrating various **interactive and dynamic websites** availableonline, addressing the students on identifying the case study to build an interactive anddatabase driven website, forms to be used in website, database to be maintained, reports to beproduced,etc.

2. **For Student**: Students shall (individually) search online and visit any of the agencies likemalls, hotels, super bazaars, etc. where there is a need for an interactive and database drivenwebsiteandsubmitahand-writtenFieldwork/Projectwork/Projectwork/Projectwork/Project work Report not exceeding 10 pages. Example: Choosing a firm or business todevelop a website, identifying forms to be placed in the websites, back end databases to bemaintainedand reports to begenerated and placedin thewebsites.

3. Max marks for Fieldwork/Project work/Project work/Project work/Project work/ProjectworkReport: 05.

4. Suggested Format for Fieldwork/Project work/Project work/Project work/Project work:*Title page, student details, index page, details of place or websites visited, structure of thewebsiteand acknowledgements*.

5. Unittests(IE).

b) Suggested Co-Curricular Activities

1. ArrangeexpertlecturesbyITexpertsworkingprofessionallyintheareaofwebcontentdevelopment

2. Assignments(inwritingorimplementingcontentsrelatedtosyllabusoroutsidethesyllabus.Shall beindividualand challenging)

3. Seminars,Groupdiscussions,Quiz,Debates etc.(onrelatedtopics).

4. Preparationbystudentson best websites.

5. Arrangeawebpagedevelopment competitionamongsmallgroupsof students.

SRI VENKATESWARA UNIVERSITY

B.Sc. DEGREE COURSE IN COMPUTER SCIENCE

V SEMESTER - W.E.F. 2022-23

COURSE7A: WEB APPLICATIONS DEVELOPMENT USINGPHP & MYSQL

MODEL QUESTION PAPER

Time: 3 hours Marks: 75 marks

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.Part B consists of 5 Units. Answer one full question (A or B) from each unit (i.e., Q.No 9 from Unit – I, Q.No 10 from Unit – II, Q.No 11 from Unit – III, Q.No 12 from Unit – IV, Q.No 13 from Unit – V). Each question carries 10 marks.

PART – A

Answer any *Five* of the following question. (5X5=25M)

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

(P.T.O)

PART – B

Answer All The Questions. Each question carries 10 marks (5X10= 50M)

9.	(A) OR (B)
10.	(A) OR (B)
11.	(A) OR (B)
12.	(A) OR (B)
13.	(A) OR (B)

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COURSE 7A: WEB APPLICATIONS DEVELOPMENT USING PHP & MYSQL –

PRACTICAL SYLLABUS

V. Learning Outcomes:

Onsuccessfulcompletionofthispracticalcourse, studentshallbeableto:

1. Write,debugandimplementthePrograms byapplyingconceptsanderrorhandlingtechniquesofPHP.
2. Createaninteractiveand dynamicwebsite.
3. Createawebsitewithreportsgeneratedfromadatabase.
4. Writeprogramstocreateaninteractivewebsitefore-commercesiteslikeonlineshopping,etc.

VI. Practical(Laboratory)Syllabus: *(30hrs.)*

1. WriteaPHPprogramto Display“Hello”
2. WriteaPHP Programtodisplaythetoday’sdate.
3. WriteaPHPprogramtodisplayFibonacciseries.
4. WriteaPHPProgramtoreadtheemployeedetails.
5. WriteaPHPprogram topreparethe studentmarks list.
6. WriteaPHPprogramtogeneratethemultiplicationoftwo matrices.
7. Createstudentregistrationformusingtextbox,checkbox,radiobutton,select,submitbutton. And displayuser inserted value innewPHP page.
8. CreateWebsiteRegistrationFormusingtextbox,checkbox,radiobutton,select,submitbutton. And displayuser inserted value innewPHP page.
9. WritePHPscriptto demonstratepassingvariables withcookies.
10. Writeaprogramto keeptrack ofhow manytimes avisitor hasloaded thepage.
11. WriteaPHP applicationto add new Rowsin aTable.
12. WriteaPHP application to modifythe Rows in aTable.
13. WriteaPHPapplication todelete theRows from aTable.
14. WriteaPHP applicationto fetch theRowsin aTable.
15. DevelopanPHPapplicationtoimplementthe followingOperations

i. RegistrationofUsers.

ii. Insertthedetails oftheUsers.

iii. Modifythe Details.

iv. TransactionMaintenance.

a) Nooftimes Logged in

b) TimeSpent oneach login.

c) Restricttheuserforthree trials only.

d) Deletethe user ifhespentmorethan 100 Hrs oftransaction.

16. WriteaPHPscripttoconnectMySQLserverfromyourwebsite.

17. Writeaprogramtoreadcustomerinformationlikecust-no,cust-name,item-purchased, and mob-no, from customer table and display all these information intableformat on output screen.

18. Write a program to edit name of customer to “Kiran” with cust-no =1, and to deleterecord with cust-no=3.

19. Write a program to read employee information like emp-no, emp-name,designationandsalaryfromEMPtableanddisplayallthisinformationusingtableformatinyour website.

20. Createadynamicweb siteusingPHP andMySQL.

CourseCode:

SRI VENKATESWARA UNIVERSITY
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SEMESTER SYSTEM WITH CBCS
SEMESTER V

W.E.F. 2022-2023

Skill Enhancement Courses (SECs) for Semester V, from 2022-23 *(Syllabus with Learning Outcomes, References, Co-curricular Activities)*

Course 6B: INTERNET OF THINGS

Max Marks: 100+50

(Skill Enhancement Course (Elective),Credits:05)

I. LearningOutcomes: Studentsaftersuccessfulcompletionofthecoursewillbeabl eto:

1. Appreciatethetechnologyfor IoT
2. Understandvariousconcepts,terminologiesandarchitectureof IoTsystems.
3. Understandvariousapplicationsof IoT
4. LearnhowtousevarioussensorsandactuatorsfordesignofIoT.
5. Learnhowtoconnectvariousthingsto Internet.
6. Learntheskillstodevelopsimple IOTDevices.

II. **Syllabus:***(TotalHours:90including Teaching,Lab,Fieldtraining, Unittestsetc.)*

Unit-I (10 hours)

Fundamentals of IoT: Introduction, Definitions & Characteristics of IoT, IoT Architectures,Physical & Logical Design of IoT, Enabling Technologies in IoT, History of IoT, AboutThings in IoT, The Identifiers in IoT, About the Internet inIoT,IoTframeworks,IoTandM2M.**ApplicationsofIoT:**HomeAutomation,Smar tCities,Energy,RetailManagement,Logistics, Agriculture, Health and Lifestyle, Industrial IoT, Legal challenges, IoT designEthics,IoT in Environmental Protection.

Unit-II (10 hours)

SensorsNetworks:Definition,TypesofSensors,TypesofActuators,Examplesand Working,IoTDevelopmentBoards:ArduinoIDEandBoardTypes,RaspberriPiDev elopment Kit, RFID Principles and components, Wireless Sensor Networks: History andContext,Thenode, Connectingnodes, NetworkingNodes, WSN andIoT.

Unit-III (10 hours)

WirelessTechnologiesforIoT:WPANTechnologiesforIoT:IEEE802.15.4,Zigbee,H ART,NFC,Z-Wave,BLE,BacnetAnd Modbus.

IPBasedProtocolsforIoTIPv6,6LowPAN,LoRA,RPL,REST,AMPQ,CoAP,MQTT.Edgeconnectivityandprotocols.

Unit-IV (10 hours)

Arduino Simulation Environment: Arduino Uno Architecture, Setting up the IDE, WritingArduino Software,Arduino Libraries,Basics of Embedded C programmingforArduino,InterfacingLED,pushbuttonandbuzzerwithArduino,InterfacingArduinowithLCD.Sensor&ActuatorswithArduino:OverviewofSensorsworking,AnalogandDigitalSensors,InterfacingofTemperature,Humidity,Motion,LightandGasSensorswithArduino,Interfacing of Actuators with Arduino,Interfacing of Relay Switch and ServoMotorwith Arduino.

Unit-V (10 hours)

Developing IOT's:Implementation of IoT with Arduino, Connecting and using various IoTCloud Based Platforms such as Blynk, Thingspeak, AWS IoT, Google Cloud IoT Core etc.CloudComputing, FogComputing, PrivacyandSecurityIssues inIoT.

III. References

9. Internet of Things - A Hands-on Approach, ArshdeepBahga and Vijay Madisetti,UniversitiesPress, 2015, ISBN: 9788173719547
10. Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-onApproach)", 1stEdition, VPT, 2014
11. DanielMinoli,—"BuildingtheInternetofThingswithIPv6andMIPv6:TheEvolvingWorldofM2MCommunications",ISBN:978-1-118-47347-4,WillyPublications
12. PethuruRajandAnupamaC.Raman,"TheInternetofThings:EnablingTechnologies,Platforms,and UseCases", CRCPress
13. Opensourcesoftware/learningwebsites
    a. https://github.com/connectIOT/iottoolkit
    b. https://www.arduino.cc/
    c. https://onlinecourses.nptel.ac.in/noc17_cs22/course
    d. http://www.cse.wustl.edu/~jain/cse570-15/ftp/iot_prot/index.html
    e. Contiki(OpensourceIoToperatingsystem)
    f. Ardudroid(opensourceIoTproject)
    g. https://blynk.io(Mobileapp)
    h. IoTToolkit (smartobjectAPIgatewayservicereferenceimplementation)

6.Other websourcessuggestedby the teacher concernedandthe college librarianincludingreadingmaterial.

IV. Co-CurricularActivities:

a) **Mandatory:***(Trainingofstudents byteacher in fieldrelatedskills:(lab: 10+field: 05):*

1. **For Teacher**: Field related training of students by the teacher in laboratory/field for notless than 15 hours on identifying the case study for the IoT,design an IoT solution,buildphysicalIoT device,connect itto amobileapp anddeploytheIoTdevice.

2. **For Student**: Students shall (individually) search online and visit any of the places likeaquaculture farms, agencies using IOT devices, etc to identify problemsforIoTsolutionandsubmitahandwrittenFieldwork/Projectwork/Projectwork/Projectwork/ProjectworkReport not exceeding 10 pages. Example: Choosing a Problem for IoT solution (agriculture,aquaculture, smart home appliances, testing moisture levels, oxygen levels, etc), reasons whyIoTsolutionisfeasibleforthesaidproblem,materialrequired,Designandarchitectureforthe proposedIoTdevice,methodofimplementationandhowtoconnect the devicetomobile.

3. Max marks for Fieldwork/Project work/Project work/Project work/Project work/ProjectworkReport: 05.

4. Suggested Format for Fieldwork/Project work/Project work/Project work/Project work:*Titlepage,studentdetails,indexpage,detailsofwebsitessearched,placevisited,observations, findings, proposed IOT problem, and design of the IOT device, implementationandacknowledgements*.

5. Unittests(IE).

b) Suggested Co-Curricular Activities

1. Trainingof students byrelated industrial experts.

2. Assignments

3. Preparation and presentation of power-point slides, which include videos, animations,pictures,graphics,etc bythe students.

4. Seminars,Groupdiscussions,Quiz,Debatesetc.(onrelatedtopics).

5. Fieldvisitsto identifytheproblems forIoTsolutions.

SRI VENKATESWARA UNIVERSITY

B.Sc. DEGREE COURSE IN COMPUTER SCIENCE

V SEMESTER - W.E.F. 2022-23

COURSE 6B: INTERNET OF THINGS

MODEL QUESTION PAPER

Time: 3 hours Marks: 75 marks

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.Part B consists of 5 Units. Answer one full question (A or B) from each unit (i.e., Q.No 9 from Unit – I, Q.No 10 from Unit – II, Q.No 11 from Unit – III, Q.No 12 from Unit – IV, Q.No 13 from Unit – V). Each question carries 10 marks.

PART – A

Answer any *Five* of the following question. (5X5=25M)

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

(P.T.O)

PART – B

Answer All The Questions. Each question carries 10 marks (5X10= 50M)

9.	(A) OR (B)
10.	(A) OR (B)
11.	(A) OR (B)
12.	(A) OR (B)
13.	(A) OR (B)

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COURSE 6B : INTERNET OF THINGS

PRACTICAL SYLLABUS

V. LearningOutcomes:

Onsuccessfulcompletionofthispracticalcourse, studentshallbeableto:

1. Acquiretheskillsto designasmallIoTdevice.
2. Connect various sensors, actuators, etctoArduinoboard.
3. Connectthethingsto Internet
4. Designasmallmobile apptocontrol thesensors.
5. Deployasimple IoTdevice.

VI. Practical(Laboratory)Syllabus: *(30hrs)*

1. UnderstandingArduinoUNOBoardandComponents
2. InstallingandworkwithArduino IDE
3. BlinkingLEDsketchwithArduino
4. Simulationof4-WayTrafficLightwithArduino
5. UsingPulse Width Modulation
6. LEDFadeSketchand ButtonSketch
7. Analog InputSketch(BarGraphwith LEDs andPotentiometre)
8. DigitalRead Serial Sketch (Workingwith DHT/IR/Gas or AnyotherSensor)
9. WorkingwithAdafruitLibrariesinArduino
10. SpinningaDC Motorand Motor SpeedControl Sketch
11. WorkingwithShields
12. Design APP usingBlinkApporThingspeakAPIandconnectitLEDbulb.
13. Design APP UsingBlynk AppandConnecttoTemperature,magneticSensors.

SRI VENKATESWARA UNIVERSITY
B.Sc. DEGREE COURSE IN COMPUTER SCIENCE
SEMESTER SYSTEM WITH CBCS
SEMESTER V
W.E.F. 2022-2023

Skill Enhancement Courses (SECs) for Semester V, from 2022-23 *(Syllabus with Learning Outcomes, References, Co-curricular Activities)*

MaxMarks: 100+50

Course 7B : APPLICATION DEVELOPMENT USING PYTHON

(Skill Enhancement Course (Elective),Credits:05)

I. LearningOutcomes: Studentsaftersuccessfulcompletionofthecoursewillbeabl eto:

1. Understandandappreciatetheweb architectureandservices.
2. ExaminePythonsyntaxandsemanticsandbefluentintheuseofPythonflow controlandfunctions.
3. DemonstrateproficiencyinhandlingStringsandFileSystems.
4. Create,runandmanipulatePythonProgramsusingcoredatastructureslike Lists,Dictionariesand useRegularExpressions.
5. Interpretthe conceptsofObject-OrientedProgrammingasusedinPython.
6. ApplyconceptsofPythonprogramminginvariousfieldsrelatedtoIOT,WebS ervicesand Databases in Python.

II. **Syllabus:***(TotalHours:90including Teaching,Lab,Fieldtraining, Unittestsetc.)*

Unit-I (10 hours)

Python basics, Objects- Python Objects, Standard Types, Other Built-in Types,InternalTypes,StandardTypeOperators,StandardTypeBuiltinFunctions ,CategorizingtheStandardTypes, Unsupported Types
NumbersIntroductiontoNumbers,Integers,FloatingPointRealNumbers,Compl exNumbers,Operators,Built-in Functions, RelatedModules
Sequences-Strings, Lists,andTuples,MappingandSetTypes

Unit– II (10 hours)

Files: File Objects, File Built-in Function [open()], File Built-in Methods, File Built-inAttributes, Standard Files, Command-line Arguments, File System, File Execution, PersistentStorageModules, Related Modules
Exceptions: ExceptionsinPython,DetectingandHandlingExceptions,ContextM anagement, Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions,Creating Exceptions, Why Exceptions (Now)?, Why Exceptions at All?, Exceptions and thesysModule, Related Modules
Modules: ModulesandFiles,Namespaces,ImportingModules,ImportingModule Attributes,ModuleBuilt-in Functions,Packages,Other Features ofModules

Unit– III (10 hours)

RegularExpressions: Introduction,SpecialSymbolsandCharacters,ResandPythonMultithreaded Programming: Introduction, Threads and Processes, Python, Threads, and theGlobalInterpreter Lock,Thread Module,ThreadingModule, RelatedModules

Unit– IV (10 hours)

GUI Programming: Introduction, Tkinter and Python Programming, Brief Tour of OtherGUIs,Related Modulesand Other GUIs

Web Programming: Introduction, Wed Surfing with Python, Creating SimpleWebClients,AdvancedWebClients,CGIHelpingServersProcessClientData,BuildingCGIApplication,Advanced CGI, Web (HTTP) Servers

Unit– V (10 hours)

DatabaseProgramming: Introduction,PythonDatabaseApplicationProgrammer'sInterface (DBAPI), ObjectRelational Managers(ORMs), Related Modules.

III. References

1. **C**orePython Programming,WesleyJ. Chun,Second Edition, Pearson.
2. ThinkPython,AllenDowney,GreenTeaPress.
3. IntroductiontoPython, KennethA. Lambert,Cengage.
4. Python Programming: A Modern Approach, VamsiKurama, Pearson.
5. LearningPython,Mark Lutz,O'Really.
6. Websourcessuggestedbytheteacherconcernedandthecollegelibrarianincludingreadingmaterial.

IV. Co-CurricularActivities:

a) **Mandatory:***(Trainingofstudentsbyteacherinfieldrelatedskills:(lab: 10+field:05)*

1. **For Teacher**: Training of students by the teacher in laboratory/field for not less than 15hourson field related skills likebuildinganIOTdevicewith thehelp of Python.

2. **For Student**: Students shall (individually) identity the method to link their IOT projectdone in Paper 7A with Python and submit a hand-written Fieldwork/Project work/Projectwork/Project work/Project work Report not exceeding 10 pages. It should include a briefreport on the selected case study of IOT device, algorithm and Python program to operate theIOTdevice.

3. Max marks for Fieldwork/Project work/Project work/Project work/Project work/ProjectworkReport: 05.

4. Suggested Format for Fieldwork/Project work/Project work/Project work/Project work:*Title page, student details, index page, design of the IOT device, implementation of Pythonprogramto connect theIOT device,findingsand acknowledgements.*

5. Unittests(IE).

b) SuggestedCo-CurricularActivities

1. Trainingof students byrelated industrial experts.
2. Assignments
3. Seminars,Groupdiscussions,Quiz,Debates etc.(onrelatedtopics).
4. Presentationbystudentsonbest websites.

SRI VENKATESWARA UNIVERSITY

B.Sc. DEGREE COURSE IN COMPUTER SCIENCE

V SEMESTER - W.E.F. 2022-23

Course7B : APPLICATION DEVELOPMENT USING PYTHON

MODEL QUESTION PAPER

Time: 3 hours Marks: 75 marks

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.Part B consists of 5 Units. Answer one full question (A or B) from each unit (i.e., Q.No 9 from Unit – I, Q.No 10 from Unit – II, Q.No 11 from Unit – III, Q.No 12 from Unit – IV, Q.No 13 from Unit – V). Each question carries 10 marks.

PART – A

Answer any *Five* of the following question. (5X5=25M)

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

(P.T.O)

PART – B

Answer All The Questions. Each question carries 10 marks (5X10= 50M)

9.	(A) OR (B)
10.	(A) OR (B)
11.	(A) OR (B)
12.	(A) OR (B)
13.	(A) OR (B)

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COURSE7B : APPLICATION DEVELOPMENT USING PYTHON

PRACTICALSYLLABUS

V. LearningOutcomes:

Onsuccessfulcompletionofthispracticalcourse, studentshallbeableto:

1. Implementsimpleprogramsin Python
2. Implementprogramsrelatedtovariousdatastructureslikelists,dictionaries,etc.
3. Implementprogramsrelatedtofiles.
4. Implement applications related to databases, Web services and IOT.

VI. Practical(Laboratory)Syllabus: *(30hrs.)*

1. Write a menu driven program to convert the given temperature from Fahrenheit toCelsiusand viceversadependingupon user'schoice.
2. Write a python program to calculate total marks, percentage and grade of a student.Marks obtained in each of the three subjects are to be input by the user. Assign gradesaccordingto thefollowingcriteria:
   GradeA:Percentage>=80
   Grade B: Percentage>=70 and <80Grade C: Percentage>=60 and <70Grade D: Percentage>=40 and <60GradeE: Percentage<40
3. Write a python program to display the first n terms of Fibonacci series.
4. Writeapythonprogramtocalculatethesumandproductoftwo compatible matrices.
5. Write a function that takes a character and returns True if it is a vowel and Falseotherwise.
6. Writeamenu-drivenprogramtocreatemathematical3Dobjects
   I. curve
   II. sphere
   III. cone
   IV. arrow
   V. ring
   VI. Cylinder.
7. Writeapython programto readn integersanddisplaythemas ahistogram.

8. Writeapythonprogram todisplaysine,cosine, polynomialandexponentialcurves.

9. Write a python program to plot a graph of people with pulse rate p vs. height h. ThevaluesofP and H aretobeentered bythe user.
10. Write a python program to calculate the mass m in a chemical reaction. The mass m(in gms) disintegrates according to the formula m=60/ (t+2), where t is the time inhours.Sketch agraph fort vs. m, wheret>=0.

11. A population of 1000 bacteria is introduced into a nutrient medium. The population pgrowsas follows:
P(t) =(15000(1+t))/ (15+*e)*

12. Where the time t is measured in hours. WAP to determine the size of the population atgiventimet andplot agraph forP vs tforthe specified timeinterval.

13. Input initial velocity and acceleration, and plot the following graphs depictingequationsof motion:
I. velocitywrt time (v=u+at)
II. distancewrttime(s=u*t+0.5*a*t*t)

III. distancewrt velocity(s=(v*v-u*u)/2*a)

14. Write a program that takes two lists and returns True if they have at least one commonmember.

15. Write a Python program to print a specified list after removing the 0th, 2nd, 4th and5th elements.

16. Writeaprogramtoimplementexceptionhandling.

17. Trytoconfigurethewidgetwithvariousoptionslike:bg="green",family="tim es",size=20.

18. WriteaPython programto readlast 5linesofafile.

19. Design asimpledatabase applicationthatstorestherecordsandretrievethe same

20. Design adatabaseapplicationtosearchthespecifiedrecordfromthedatabase.

21. Designadatabaseapplicationtothatallowstheusertoadd,deleteandmodify therecords.

CourseCode:

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SEMESTER V

W.E.F. 2022-2023

Skill Enhancement Courses (SECs) for Semester V, from 2022-23

(Syllabus with Learning Outcomes, References, Co-curricular Activities)

COURSE 6C : DATA SCIENCE

MaxMarks: 100+50

(Skill Enhancement Course(Elective),Credits:05)

I. **LearningOutcomes:**Studentsaftersuccessfulcompletionofthecoursewillbeabl eto:

1. Developrelevantprogrammingabilities.
2. Demonstrateproficiencywithstatisticalanalysisofdata.
3. Developtheabilityto build and assess data-basedmodels.
4. Demonstrateskillindata management
5. Apply data science concepts and methods to solve problems in real-world contextsandwill communicate thesesolutions effectively

II. **Syllabus:**(*(TotalHours:90including Teaching,Lab,Fieldtraining, Unittestsetc.)*

UNITI (10hours)

Introduction: The Ascendance of Data, What is Data Science? , Finding key Connectors,Data Scientists You May Know, Salaries and Experience, Paid Accounts, Topics of Interest,Onward.

Python: Getting Python, The Zen of Python, Whitespace Formatting, Modules, Arithmetic,Functions, Strings, Exceptions, Lists, Tuples, Dictionaries, Sets, Control Flow, Truthiness,Sorting, List Comprehensions, Generators and Iterators, Randomness, Object – OrientingProgramming, Functional Tools, enumerate, zip and Argument Unpacking, args and kwargs,Welcometo DataSciencester!

VisualizingData:matplotlib,Barcharts, Linecharts,Scatterplots.

LinearAlgebra: Vectors,Matrices.

UNITII (10 hours)

Statistics: Describing a Single Set of Data, Correlation, Simpson's Paradox, some OtherCorrelationCaveats, Correlation and Causation.

Probability: DependenceandIndependence,ConditionalProbability,Bayes'sTh

eorem,Random Variables, Continuous Distributions, The Normal Distribution, The Central LimitTheorem.

HypothesisandInference: StatisticalHypothesisTesting,Example:FlippingaCoin,Confidence Intervals,P-hacking,Example:RunninganA/BTest,BayesianInference.

Gradient Descent: The Idea behind Gradient Descent, Estimating the Gradient, Using theGradient,ChoosingtheRightStepSize,PuttingItAllTogether,Stochastic GradientDescent.

UNITIII (10 hours)

Getting Data: stdin and stdout, Reading Files – The Basics of Text Files, Delimited Files,Scraping the Web -HTML and the parsing Thereof, Example: O'Reilly Books About Data,UsingAPIs –JSON(and XML),Using anUnauthenticated API,FindingAPIs.

WorkingwithData:ExploringYourData,ExploringOne-DimensionalData,TwoDimensionsManyDimensions,CleaningandMunging,ManipulatingData,Rescaling,DimensionalityReduction.

MachineLearning: Modeling,WhatIsMachineLearning? Overfittingandunderfitting,Correctness,TheBias-VarianceTrade-off, FeatureExtractionand Selection

UNITIV (10 hours)

K-Nearest Neighbors: The Model, Example: Favorite Languages,The CurseofDimensionality.

NaiveBayes:AReallyDumbSpamFilter,AMoreSophisticatedSpamFilter,Implementation,TestingOurModel.

SimpleLinearRegression: TheModel,UsingGradientDescent,MaximumLikelihodEstimation.

MultipleRegression: TheModel,FurtherAssumptionsoftheLeastSquaresModel,FittingtheModel,InterpretingtheModel, Goodness ofFit.

UNITV (10hours)

Logistic Regression: The Problem, The Logistic Function, Applying the Model, Goodness ofFitSupport Vector Machines.

DecisionTrees: WhatIsaDecisionTree? Entropy,TheEntropyofaPartition,CreatingaDecisionTree, Putting ItAll Together,Random Forests.

NeuralNetworks: Perceptron,Feed-ForwardNeuralNetworksAndBackpropagation,Example:DefeatingaCAPTCHA.

Clustering: TheIdea,TheModel,Example:Meetups,Choosingk,Example:ClusteringColors,Bottom-up Hierarchical Clustering.

III. References

1. DataSciencefrom Scratch byJoel GrusO'ReillyMedia
2. Wes McKinney, "Python for Data Analysis: Data Wrangling with Pandas, NumPy,andIPython", O'Reilly,2nd Edition, 2018.
3. JakeVanderPlas,"PythonDataScienceHandbook:EssentialToolsforWorkingwithData",O'Reilly, 2017.
4. Webresources:

a. https://www.edx.org/course/analyzing-data-with-python
b. http://math.ecnu.edu.cn/~lfzhou/seminar/ [Joel Grus] Data Science from Scratch First Princ.pdf

5. 9.Other web sources suggested by the teacher concerned and the college librarianincludingreadingmaterial.

IV. Co-CurricularActivities:

a) **Mandatory:** *(Trainingofstudentsbyteacher infieldrelatedskills: (lab:10+field:05):*

1. **For Teacher**: Field related training of students by the teacher in laboratory/field for notless than 15 hours on identifying, analyzing and presenting the data and then to predict thefutureinstances.

2. **For Student**: Students shall (individually) search online and visit any of the agencies likeStatisticalcell,weatherforecastingcenters,pollutioncontrolboards,manufacturingindustries, agriculture departments, etc. to observe the manual process going on to collect thedata, maintain the data, present the data and to predict the data for future instances and submita hand-written Fieldwork/Project work/Project work/Project work/Project work Report notexceeding10 pages.

3. Max marks for Fieldwork/Project work/Project work/Project work/Project work/ProjectworkReport: 05.

4. Suggested Format for Fieldwork/Project work/Project work/Project work/Project work:*Title page, student details, index page, details of place visited, observations, findings andacknowledgements*.

5. Unittests(IE).

b) SuggestedCo-CurricularActivities

1. Trainingof students byrelated industrial experts.
2. Assignments
3. Seminars,Groupdiscussions,Quiz,Debates etc.(onrelatedtopics).
4. Presentationbystudents inrelatedtopics.

B.Sc. DEGREE COURSE IN COMPUTER SCIENCE

V SEMESTER - W.E.F. 2022-23

COURSE 6C : DATA SCIENCE

MODEL QUESTION PAPER

Time: 3 hours Marks: 75 marks

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.Part B consists of 5 Units. Answer one full question (A or B) from each unit (i.e., Q.No 9 from Unit – I, Q.No 10 from Unit – II, Q.No 11 from Unit – III, Q.No 12 from Unit – IV, Q.No 13 from Unit – V). Each question carries 10 marks.

PART – A

Answer any *Five* of the following question. (5X5=25M)

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

(P.T.O)

PART – B

Answer All The Questions. Each question carries 10 marks (5X10= 50M)

9.	(A) OR (B)
10.	(A) OR (B)
11.	(A) OR (B)
12.	(A) OR (B)
13.	(A) OR (B)

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COURSE 6C : DATA SCIENCE

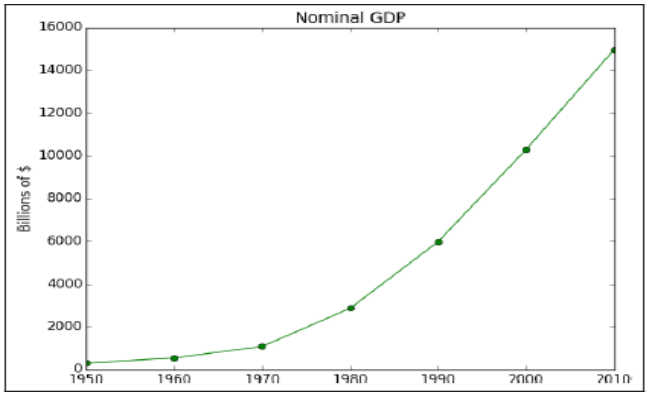
PRACTICAL SYLLABUS

V. Learning Outcomes: On successful completion of this practical course, student shall beable to:

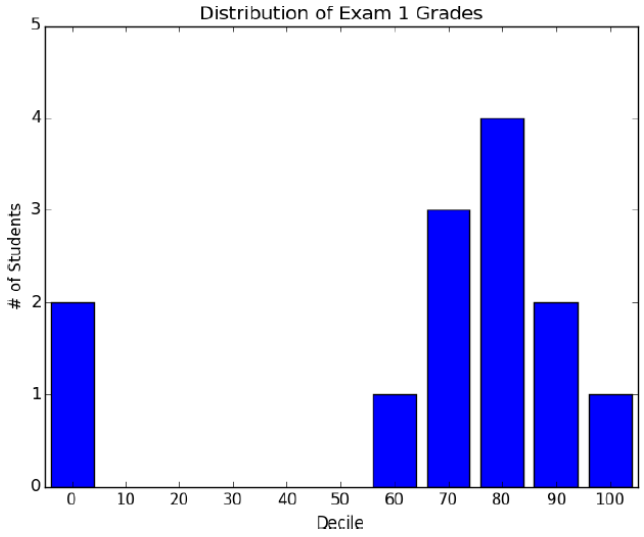
1. Applydatasciencesolutions to real world problems.
2. Implement the programs to get the required data, process it and present the outputsusingPython language.
3. ExecutestatisticalanalyseswithOpensourcePythonsoftware.

VI. Practical(Laboratory)Syllabus: *(30hrs.)*

1. WriteaPythonprogramtocreatealinechartforvaluesofyearandGDPasgivenbelow



2. Write a Python program to create a bar chart to display number of students secured different grading as given below



3. Write a Python program to create a time series chart by taking one year month

wisestockdata in aCSV file

4. WriteaPythonprogram toplot distributioncurve
5. Import a CSV file and perform various Statistical and Comparison operations onrows/columns. Writeapythonprogramto plotagraphofpeoplewithpulseratepvs.heighth. Thevalues ofPand Hareto be enteredbythe user.
6. Import rainfall data of some location with the help of packages available in R Studioandplot achart ofyour choice.

Course Code:

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Skill Enhancement Courses (SECs) for Semester V, from 2022-23

(Syllabus with Learning Outcomes, References, Co-curricular Activities)

COURSE 7C : PYTHON FOR DATA SCIENCE

Max Marks: 100+50

(Skill Enhancement Course (Elective), Credits:05)

I. LearningOutcomes: Studentsaftersuccessfulcompletionofthecoursewillbeabl eto:

1. Identify the need for data science and solve basic problems using Python built-in datatypesandtheirmethods.
2. Design anapplicationwithuser-definedmodulesandpackagesusingOOPconcept
3. Employefficient storage and dataoperations usingNumPyarrays.
4. Applypowerful datamanipulations usingPandas.
5. Dodatapre-processingandvisualization usingPandas

II. **Syllabus:***(TotalHours:90including Teaching,Lab,Fieldtraining, Unittestsetc.)*

Unit-I (10hours)

IntroductiontoDataScience-WhyPython?-EssentialPythonlibraries - PythonIntroduction - Features, Identifiers, Reserved words, Indentation, Comments, Built-in Datatypes and their Methods: Strings, List, Tuples, Dictionary, Set - Type Conversion- Operators.Decision Making- Looping- Loop Control statement- Math and Random number functions.Userdefined functions-functionarguments&its types.

UNIT–II (10 hours)

User defined Modules and Packages in Python- Files: File manipulations, File and Directoryrelatedmethods -PythonException Handling.
OOPsConcepts-ClassandObjects,Constructors–Datahiding-DataAbstraction-Inheritance.

UNIT–III (10 hours)

NumPyBasics:ArraysandVectorizedComputation-TheNumPyndarray-Creatingndarrays- Data Types for ndarrays- Arithmetic with NumPy Arrays-

BasicIndexingandSlicingBooleanIndexingTransposingArraysandSwappingAxes.UniversalFunctions:FastElementWiseArrayFunctionsMathematicalandStatisticalMethods-Sorting-Uniqueand Other SetLogic.

UNIT–IV (10 hours)

IntroductiontopandasDataStructures:Series,DataFrameandEssentialFunctionality:Dropping Entries- Indexing, Selection, and Filtering- Function ApplicationandMappingSortingandRanking.SummarizingandComputingDescriptiveStatisticsUniqueValues,ValueCounts,andMembership. Readingand WritingData inText Format

UNIT–V (10hours)

Data Cleaning and Preparation: Handling Missing Data - Data Transformation: RemovingDuplicates, Transforming Data Using a Function or Mapping, Replacing Values, DetectingandFilteringOutliers-StringManipulation: VectorizedStringFunctions inpandas.
Plotting with pandas: Line Plots, Bar Plots, Histograms and Density Plots, Scatter or PointPlots.

III. References

1. Y.DanielLiang,"IntroductiontoProgrammingusingPython",Pearson,2012.
2. Wes McKinney, "Python for Data Analysis: Data Wrangling with Pandas, NumPy,andIPython", O'Reilly,2nd Edition, 2018.
3. Jake VanderPlas, "Python Data Science Handbook: Essential Tools for Working withData",O'Reilly, 2017.
4. WesleyJ.Chun,"CorePythonProgramming",PrenticeHall,2006.
5. MarkLutz,"LearningPython",O'Reilly,4thEdition,2009.
6. Webresources:
    a. https://www.edx.org/course/python-basics-for-data-science
    b. https://www.edx.org/course/analyzing-data-with-python
    c. https://www.coursera.org/learn/python-plotting?specialization=data-science-python
    d. https://www.programmer-books.com/introducing-data-science-pdf/
    e. https://www.cs.uky.edu/~keen/115/Haltermanpythonbook.pdf
7. Otherwebsourcessuggestedbytheteacher concernedandthecollegelibrarianincludingreadingmaterial.

IV. Co-CurricularActivities:

***a)* Mandatory:** *(Trainingofstudentsbyteacherinfieldrelatedskills:(lab:10+field:05):*
1. **For Teacher**: Field related training of students by the teacher in laboratory/field for notless than 15 hours on collecting the data, analyzing the data and presenting the data usingPythonlanguagewith some real timedata.

2. **For Student**: Students shall (individually) visit any of the agencies like Agriculture dept,statistical cell, irrigation department, Ground water department, CPO office, Rural WaterSupply andSanitationdepartmentetcorsearchonlinetogetrealtimedatalikeAidsdatabase, weather forecasting database, social networking data, etc and identify any onedatabase, implement and present the necessary charts in Python languageandsubmitahand-writtenFieldwork/Projectwork/Projectwork/Projectwork/ ProjectworkReportnotexceeding10pages.Example:Identifyingadatabase,getthedata,presentthedatainrequiredcharts and to predict the futureinstancesif possible.

3. Max marks for Fieldwork/Project work/Project work/Project work/Project work Report:05.

4. Suggested Format for Fieldwork/Project work/Project work/Project work/Project work:*Title page, student details, index page, and details of place visited, observations, method ofdata collection, database identified, and implementation in Python language, other findingsandacknowledgements.*

5. Unittests(IE).

b) Suggested Co-Curricular Activities

2. Trainingof students byrelated industrial experts.

3. Assignments

4. Seminars,Groupdiscussions,Quiz,Debates etc.(onrelatedtopics).

5. Presentationbystudents onthe topicswithin andoutsidethesyllabus.

B.Sc. DEGREE COURSE IN COMPUTER SCIENCE

V SEMESTER - W.E.F. 2022-23

COURSE 7C : PYTHON FOR DATA SCIENCE

MODEL QUESTION PAPER

Time: 3 hours Marks: 75 marks

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.Part B consists of 5 Units. Answer one full question (A or B) from each unit (i.e., Q.No 9 from Unit – I, Q.No 10 from Unit – II, Q.No 11 from Unit – III, Q.No 12 from Unit – IV, Q.No 13 from Unit – V). Each question carries 10 marks.

PART – A

Answer any *Five* of the following question. (5X5=25M)

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

(P.T.O)

PART – B

Answer All The Questions. Each question carries 10 marks (5X10= 50M)

9.	(A) OR (B)
10.	(A) OR (B)
11.	(A) OR (B)
12.	(A) OR (B)
13.	(A) OR (B)

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COURSE 7C : PYTHON FOR DATA SCIENCE

PRACTICALSYLLABUS

V. **Learning Outcomes:** On successful completion of this practical course, student shall be able to:

1. Implementsimpleprogramsin Python.
2. Implementprogramsrelatedtovariousstructureslikearrays,lists,Data frames,etc.
3. Implementprogramsrelatedtofiles.
4. Implementapplicationsrelatedto datascience.

VI. **Practical(Laboratory)Syllabus**: *(30hrs.)*

1. Perform Creation, indexing, slicing, concatenation and repetition operations onPythonbuilt-in datatypes: Strings,List, Tuples, Dictionary, Set
2. Apply Python built-in data types: Strings, List, Tuples, Dictionary, Set and theirmethodsto solveanygiven problem.
3. Handlenumericaloperationsusingmathandrandomnumber functions
4. Createuser-definedfunctionswithdifferenttypes offunctionarguments.
5. Createpackagesandimportmodulesfrompackages.
6. Perform File manipulations- open, close, read, write, append and copy from onefiletoanother.
7. Writeaprogram forHandleExceptions usingPython Built-in Exceptions
8. Write a program to implement OOP concepts like Data hiding and DataAbstraction.
9. Create NumPy arrays from Python Data Structures, Intrinsic NumPy objects andRandomFunctions.
10. Manipulation of NumPy arrays- Indexing, Slicing, Reshaping, Joining andSplitting.
11. Computation on NumPy arrays using Universal Functions and Mathematicalmethods.
12. Loadanimage fileanddocropandflipoperationusingNumPyIndexing.
13. CreatePandasSeriesandDataFrame fromvariousinputs.
14. Import anyCSVfiletoPandasDataFrameandperformthefollowing:
    (a) Visualizethefirstandlast10records
    (b) Gettheshape,index andcolumndetails
    (c) Select/Deletethe records(rows)/columnsbasedonconditions.

(d) Performrankingand sortingoperations.

(e) Dorequiredstatisticaloperationsonthe givencolumns.

(f) Findthecountanduniquenessofthe given categoricalvalues.

(g) Renamesingle/multiplecolumns

15. ImportanyCSVfiletoPandas DataFrameandperformthefollowing:

(a) Handle missingdatabydetectinganddropping/ fillingmissingvalues.

(b) Transformdatausingapply()and map() method.

(c) Detectand filteroutliers.

(d) PerformVectorizedStringoperationsonPandasSeries.

(e) Visualize data using Line Plots, Bar Plots, Histograms, Density PlotsandScatter Plots.
