

Shree Chanakya Education Society's Indira College of Commerce and Science Pune





Shri Chanakya Education Society's Indira College of Commerce and Science, Pune '**Dhruv',** 89/2A, New Pune-Mumbai Highway, Tathwade, Pune – 411033 **Tel:** +91-20-66759400, +91-20-66759507/515/637, +91-20-66759502/504 **Fax:** +91-20-66759490

An Autonomous College, affiliated to Savitribai Phule Pune University Approved by Govt of Maharashtra (Accredited with A grade by NAAC under CGPA)

COMMERCE AND SCIENCE Autonomous Status by UGC, New Delhi) Affiliated to Savitribai Phule Pune University & 'NAAC-A' Accredited ID : (PU/PN/SC/COM/166/2001) AISHE No - C-41313

SHREE CHANAKYA EDUCATION SOCIETY'S

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Date: 24th Feb.2024

NOTICE

This is to inform all the Honorable members of Board of Studies that the 9th meeting of Board of Studies in Computer Application is conveyed on 24 Feb.2024, Saturday, at 11 am at Indira College of commerce and science in online mode.

You are requested to confirm your presence for the same.

The agenda of the meeting is enclosed herewith.

Venue: - Online Zoom Meeting Link:- https://us04web.zoom.us/j/74214769577?pwd=AWUD0Z7zN69QbCxpnTmJCT6TAerj1a.1

Meeting ID: 742 1476 9577 Passcode: 1T3qVF

Thanking You.

Badshaha Nadat Member Secretary, Board of Studies (Computer Application)



9th BOARD OF STUDIES MEETING (COMPUTER APPLICATION)

AGENDA

Date: 24th Feb.2024

Time: 11:00 AM

Venue: - Online Zoom Meeting

Link:- https://us04web.zoom.us/j/74214769577?pwd=AWUD0Z7zN69QbCxpnTmJCT6TAerj1a.1

Meeting ID: 742 1476 9577 Passcode: 1T3qVF

ITEM NO.	PARTICULARS						
	Welcome Note by the Chairperson.						
44	To discuss and seek approval of the minutes of the 8th BOS meeting						
45	To discuss and seek approval for the syllabus BBA-CA Sem-III under NEP.						
46	Any other item with the permission of chairperson (Confidential and others)						
47	Comments and Announcements (If any)						
	Vote of Thanks proposed by Member Secretary						
	Announcement of Adjournment of meeting						



MEMBERS OF BOARD OF STUDIES (COMPUTER APPLICATION)

Sr.No	Number	Category	Nature	Name of the Member	Designation
1	01	Head of the department	Chairman	Mr. Shivendu Bhushan	Vice-Principal, HOD- BBA-CA & BCA Science, Indira College of Commerce and Science
2	13	Entire Faculty of each specialization	Members	Dr. Janardan Pawar	Principal, HOD-BSc(Comp Science), Indira College of Commerce and Science
				Mr. Shivendu Bhushan	Vice-Principal, HOD- BBA-CA & BCA Science, Indira College of Commerce and Science
				Mr. Vishal Verma	Asst. Professor, BBA-CA Indira College of Commerce and Science
				Mr. Ashish Dhoke	Asst. Professor, BBA-CA Indira College of Commerce and Science
				Ms. Tejashree Phalle	Asst. Professor, BBA-CA Indira College of Commerce and Science
				Mr. Badshaha Nadaf	Asst. Professor, BBA-CA Indira College of Commerce and Science
		6		Ms. Shubhangi Chavan	Asst. Professor, BBA-CA Indira College of Commerce and Science
				Mr. Sumit Sasane	Asst. Professor, BBA-CA Indira College of Commerce and Science
				Ms. Divya Chitre	Asst. Professor, BBA-CA Indira College of Commerce and Science
		SUF COMA		Mr. Atish Shrinivar	Asst. Professor, BBA-CA Indira College of Commerce and Science
		TTO P JNE-33	CE & 50	Mr. Ganesh Bhondve	Asst. Professor, BBA-CA Indira College of

					Commerce and Science
				Ms. Vividha Bahety	Asst. Professor, BBA-CA Indira College of Commerce and Science
				Ms. Hemangi Rane	Asst. Professor, BBA-CA Indira College of Commerce and Science
3	02	Subject Expert from outside parent University	Nominated by academic council	Dr. Shriram Raut	Asst.Professor, Department of Computer Science, School of Communication Science, P.A.Holkar, Solapur University
				Dr. Sachin Bhoite	Asst.Professor & Program Officer (MSc. Data Science & Big Data Analyst), MIT Kotharud, Pune
4	01	Expert	Nominated by the Vice- Chancellor from a panel of six recommended by the director	Dr. Manisha Bharambe	MES Abasaheb Garware College of Arts and Science, Pune
5	01	Representative from Industry	For Industry Institution Interaction	Mr. Guruprasad Chakalabbi	Software Engineer, Virtusa Pvt.Ltd.Pune
6	01	Alumnus	Post Graduate meritorious alumnus to be nominated by the Director	Mr. Saddam Sayyad	Co-founder ParamLogic Infotech Pvt.Ltd. Pune
Chair	man,BOS, 1	may co-opt the follow	wing with the appr	oval from the direct	or of the institute
01	Expert fr wheneve formulate	om outside the Autor r special courses of s ed	nomous College, studies are to be	Dr. Anwer Shaikh	Principal Poona College of Arts, Commerce and Science



Date: 24-02-2024

ANNEXURE-1

Minutes of the 9th Meeting of the Board of Studies (Computer Application) held on 24th Feb. 2024, Saturday, through online Zoom Meeting platform at 11.00 AM.

Following Members were present for the Meeting:

1. Prof. Shivendu Bhushan

2. Dr. Shubhangi Bharambe

3. Dr. Shriram Raut

4. Prof. Sachin Bhoite

5. Mr. Guruprasad Chakalabbi

6. Prof. Badshaha Nadaf

7. Prof. Atish Shrinivar

8. Prof. Nadaf Badshaha

9. Prof. Tejashree Phalle

10. Prof. Vividha Bahety

11. Prof. Sumit Sasane

12. Prof. Ganesh Bhondve

13. Prof. Divya Chitre

14. Prof. Shubhangi Chavan



The agenda points were taken up for the discussion

Welcome Note by the Chairperson

The Honorable Chairman, Prof. Shivendu Bhushan welcomed all members of the Board of Studies in Computer Application constituted as per the guidelines of UGC for autonomous Institutes and approved by Savitribai Phule Pune University.

The agenda points were taken up for discussion.

The Secretary of Board of Studies (Computer Application) briefed all the Members regarding Agenda of the Ninth Board of Studies - Computer Application meeting and gave a brief introduction about Indira College of Commerce & Science to all the members of Board of Studies (Computer Application). He mentioned that Indira College of Commerce and Science were established in the year 2001 under the wings of Shree Chanakya Education Society (SCES). They were merged in the year 2007 as Indira College of Commerce and Science. Affiliated and approved by Savitribai Phule Pune University, Pune. ICCS offers the Bachelor's Program in Commerce, Business Administration, Computer Application, Computer Science, Masters in Computer Science and Masters in Commerce.

ICCS has been accredited with 'A' grade by "National Accreditation and Assessment Council" (NAAC) and "An Autonomous Status by UGC, New Delhi

Item No. Feb 2024/24/44: To Discuss and Seek Approval of the Minutes of the Previous meeting.

Discussion:

After the brief introduction, **Member Secretary** gave a brief summary of minutes of 8th Board of Studies meeting which was held on 24th Nov 2023, Friday at 10:30 AM. The Minutes of the Meeting of the Eight Board of Studies Meeting was already shared with all the Board of Studies Members.

Resolution: Feb 2024/24/44: All BOS members had unanimously approved the same.



Item No. Feb 2024/24/45: To discuss and seek approval for the syllabus BBA-CA Sem-III

The Member Secretary, then informed the members that there will be a discussion on the structure and subjects proposed for the Semester 3 of Second Year of the Computer Application (SYBBA-CA) and requested the members to give their valuable inputs and finally approve the structure and subjects of semester-3.

	SEMESTER 3								
Course Type	Course	Course Code	Course/Paper Title	Hour s/We ek	Credi t	CIA	ESE	Total	
Major Mandatory(4	Major Paper5(th eory)	CA-301	Python Programming	4	4	30	70	100	
+4)	Major Paper 6(theory)	CA-302	Advanced Internet Programming	4	4	30	70	100	
Major Electives	~		~	~	~	~	~	~	
Minor	Minor Paper 2	CA-303	Object Oriented Software Engineering	4	4	30	70	100	
OE(2)		CA-304	Science Basket or Management Basket	2	2	15	35	50	
VSC (2)	Major Specific Practical 3	CA-305	Practical Based on Python Programming and Advanced Internet Programming	2	2	15	35	50	
SEC(2)	~	~	~	~	~	~	~	~	
AEC(2)	MIL	CA-306	Hindi/Marathi/Sanskrit Language	2	2	15	35	50	
VEC(2)	2	~	~	~	~	~	~	~	
IKS (2)	~	~	~	~	~	~	~	~	
FP/CEP(2)	FP 1	CA-307	FP: Industrial Visits	2	2	15	35	50	
CC (2)	CC Course 3	CA-308	Health and Wellness, Yoga education, Sports and Fitness, Cultural Activities, NSS/NCC and Fine /Applied/Visual/Performing Arts	2	2	15	35	50	
		Total	COMA	22	22	165	385	550	



The Honorable Chairman, Prof. Shivendu Bhushan requested the members to go through the detailed syllabus for the Semester 3 of Second year of BBA-CA and suggest changes for approval. He also informed that for regular BBA-CA course structure of Semester 3 is same as prescribed by Savitribai Phule Pune University

The Item was Proposed by	: Mr. Badshaha Nadaf
The Item was Seconded by	: All the present members

Discussion: The members of Board of Studies discussed about the structure and syllabus of Semester 3 in detail.

Resolution Feb-2024/24/45: It was resolved that Prof. Shivendu Bhushan put up the approved structure for approval to the Academic Council.

The members gave their unanimous approval.

Item No. Feb-2024/24/46: Any other item with the permission of chairperson (Confidential and others)

No such item was placed before the meeting.

Item No. Feb-2024/24/47: Comments and Announcements (If any)

No Announcements with respect to this point.

Proposing Vote of Thanks (with Prior Permission of the Chairperson)

After discussion of the core agenda, **Mr. Badshaha Nadaf** proposed Vote of Thanks. He thanked the members for attending the meeting and giving good insights for the functioning of the Institute under Autonomy.

Announcement of Adjournment of Meeting

As there was no other topic brought for the discussion afterwards, Honorable Chairperson, Prof. Shivendu Bhushan proposed that the meeting be adjourned.

Badshaha Gulab Nadaf Member Secretary BOS (Computer Application)



Shivendu Bhushan Chairperson BOS (Computer Application) SHREE CHANAKYA EDUCATION SOCIETY'S

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NOTICE

14/02/2024

This is to inform all Honorable Members of Board of Studies that, the 10th meeting of Board of Studies- Commerce and Management (Professional Program), is conveyed on 24th February 2024, Saturday at 11.00 AM in Tutorial Room, Dhruv Building, Universe Campus, Indira College of Commerce & Science, Thathawade, Pune. Meeting will be conducted in Hybrid Mode.

You are requested to confirm your presence for the same.

The agenda for the meeting is enclosed herewith.

The meeting link:

Zoom Platform: https://zoom.us/j/94957229561?pwd=ZDF6VCtXSFZMdUUyRINENGtoclEzQT09 Meeting ID: 949 5722 9561 Passcode: iccs

Dr. Dipak Umbarkar Member Secretary, Board of Studies - Commerce and Management (Professional Course)

14/02/2024





AGENDA

10th MEETING OF BOARD OF STUDIES -COMMERCE AND

MANAGEMENT

ITEM NO.	PARTICULARS
	Passcode: iccs
	Meeting ID: 949 5722 9561
	zQT09
Online Platform	: Zoom Platform:
Profile a final	Indira College of Commerce & Science, Thathawade, Pune
Venue (Offline)	: Tutorial Room, Dhruv Building, Universe Campus,
Time	: 11am
Date of Meeting	: 24/02/2024

HEM NO.	PARTICULARS				
	Welcome note by Chairperson				
45	To discuss and obtain approval of the minutes of 9 th Board of studies Meeting, Commerce & Management (Professional Program)				
46	 To seek approval for syllabus of Third Semester (As per NEP): 1. Bachelor of Business Administration (BBA Marketing, Finance & HR Major) 2. Bachelor of Business Administration (BBA IB - International Business) 3. Bachelor of Business Administration (BBA HTM - Hospitality & Tourism) 4. Bachelor of Business Administration (BBA IE -Innovation & Entrepreneurship) 				
47	Any other item with permission of the Chairperson. (Confidential and others) Comments and Announcement (If any)				
	Vote of thanks to be proposed by Member Secretary				
cash Colona	Announcement of Adjournment of Meeting				



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SHREE CHANAKYA EDUCATION SOCIETY'S INDIRA COLLEGE OF COMMERCE AND SCIENCE

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ANNEXURE-1

Minutes of the 10th Meeting of the Board of Studies -Commerce and Management Professional Program held on 24.02.204, Saturday, held online & Offline at 11:00 AM

Following Members were Present for the online meeting:

- 1. Dr. Thomson Varghese
- 2. Dr. Mukul Burghate
- 3. Dr. Pramod H Patil
- 4. Dr. Shivaji D. Takalkar
- 5. Dr. Rama Venkatachalam
- 6. All BBA Faculty Members

The chairman extended a warm welcome to all members for the 10th meeting of the Board of Studies of Commerce and Management (Professional Program).

The agenda points were taken up for the discussion.



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Sr. No	Number	Category	Nature	Name of the Member	Designation		
01	01	Head of the Department	Chairman	Dr. Thomson Varghese	HOD BBA/BBA-IB		
				Mr. Yogesh Bhusari			
		E and the street of		Mr. Ashok Raut	-		
				Dr. Deepa Jamnik	a state of the second sec		
		CONTRACT AND IN		Mr. Ranjeet More			
				Dr. Dipak Umbarkar			
		and the second		Mr. Jeevan Kasabe	and the second se		
	1.1	All BRA Faculty	in the test setting	Ms. Sharmila Yewale			
02	14	Members	Members	Mr. Vikrant Soman	Asst. Professor		
		wielitoers		Dr. Rupali Jadhav			
		PALACE INFORM	Tollarity and a sup-	Ms. Komal Dalnar	11 You 11 March 11		
	in the second	10		Mr. Rowland Lopez			
				Dr. Sonali Bhujbal			
	1.00	et ada, General	Sec. 1. April 1.	Miss. Rutuja Kamble			
	a 11-11	- Sebyula ya Ingila ya	an alay and a	Ms. Nidhi Menaria			
03	02	Two Subject expert 02 from outside Parent University	Nominated by academic Council	Dr. Pramod H Patil	Associate Professor School of Management Sciences, Swami Ramanand Teerth Marathwada University Sub Campus Latur		
				Dr. Mukul Burghate	Associate Professor and HOD, PDIMTR, Nagpur		
04	01	One Expert	Nominated by the Vice- Chancellor from a panel of six recommended by the Autonomous College Principal	Dr. Shivaji D. Takalkar	Professor & Head, Department of Commerce, ACS, College Dept. of Commerce Narayangaon, Pune		
05	01	One Representative from Industry	Nominated by Principal	Mr. Jacob George	Global Executive, Thermax		
06	01	College Alumnus	Nominated by Principal	Miss. Amisha Kumari Chauhan	Management Executive, Schindler India Pvt. Ltd.		
07	01	Expert from outside the Autonomous College	whenever special courses of studies are to be formulated to be nominated by the principal	Dr. Rama Venkatachalam	HOD Commerce, St Mira's College of Commerce & Science Pune		

Member List of Board of Studies (Commerce And Management -Professional Programs)



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INDIRA COLLEGE OF COMMERCE AND SCIENCE, PUNE

BOARD OF STUDIES - COMMERCE AND MANAGEMENT (PROFESSIONAL PROGRAM)

MINUTES OF MEETING

Welcome Note by the Chairperson:

The Honorable Chairperson, Dr. Thomson Varghese extended a warm welcome to all BOS members for the 10th Meeting of the Board of Studies (Commerce and Management-Professional Program) constituted as per the guidelines of University Grant Commission for autonomous Institutes and approved by Savitribai Phule Pune University (SPPU).

Item No. Nov - 2024/02/45: To discuss and obtain approval of the minutes of the Previous meeting.

The Honorable Chairperson, Dr. Thomson Varghese briefed about approval of Second Semester syllabus structure and pattern as per NEP as well as evaluation pattern for the same, and it has been approved by all the BOS Members.

Item No. Nov - 2024/02/46: Approval & Suggestions on SY BBA III Sem. Syllabus Structure as per NEP Guidelines

Dr. Thomson Varghese briefed about the new syllabus structure of all courses as per New Education Policy guidelines along with the Internal and External Evaluation Pattern.

Proposed by: Dr. Thomson Varghese

Seconded by: All Board of studies members.

> Discussion 1:

The honorable member Dr. Rama Venkatachalam proposed requiring students to provide a certificate of completion from the relevant organization related to their major topic when they enrolled in the field project course.

Resolution 24 Feb - 2024/02/46:



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It is resolved that it will be made compulsory for all students to submit certificates of completion of field projects; otherwise, such projects will not be considered valid.

Item No. Feb - 2024/02/47: Any other item with the permission of chairperson (Confidential and others).

All the required points have been discussed and approved by all the honorable members and no other points have been discussed.

Comments and Announcements (If any) Proposed by: Dr. Thomson Varghese Seconded by: All Board of studies members. Vote of Thanks by The Honorable Chairperson

The Honorable Chairperson proposed a vote of thanks to all present BOS members and appreciated their valuable thoughts and suggestions based on New Education Policy Guidelines.

Announcement of Adjournment of the meeting:

The Honorable Chairperson, Dr. Thomson Varghese thanked the members for attending the meeting and giving good insights into the functioning of the college under Autonomy. The meeting was adjourned.

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Dr. Dipak Umbarkar Member Secretary, BOS-Commerce and Management Professional Program

Dr. Thomson Varghese Chairperson BOS – Commerce & Management -Professional Program



SHREE CHANAKYA EDUCATION SOCIETY'S



29/02/2024

NOTICE

This is to inform all Honorable Members of Board of Studies that, the 11th meeting of Board of Studies of Computer Science and Information Technology is scheduled on 7th Mar 2024, Monday at 11.00 am in online mode.

You are requested to confirm your presence for the 11th meeting of Board of Studies of Computer Science and Information Technology. The agenda for the meeting is enclosed herewith.

Zoom Meeting Link:

https://zoom.us/j/94647568974?pwd=VVZEVFpSbnVvS0RqQjl6Zk15WXd ZUT09

Meeting ID: 946 4756 8974 Passcode: iccs

Kavita Dhakad

Gouri Vaidya Coordinators, Board of Studies (Computer Science and Information Technology)



AGENDA

11th BOARD OF STUDIES MEETING

COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

Date: 7th Mar 2024 Time: 11:00 AM

Mode: Online

Online: Zoom meeting

ITEM NO.	PARTICULARS					
	Welcome Note by the Chairperson.					
62 To discuss and seek approval of the minutes of the 10 th BOS m Computer Science and Information Technology						
63	To Discuss and Seek approval for the additional division of Master of Science (Computer Science) with 30 seats.					
64	To Discuss and Seek approval for the new program Bachelor of Science (Data Science) Program, Structure, Syllabus of Sem-I.					
65	To Discuss and Seek approval for the new program Master of Science (Computer Application) Program, Structure, Syllabus of Sem-I.					
66	Any other point with the permission of chairperson (Confidential and others)					
67	Comments and Announcements (If any)					
	Proposing Vote of Thanks					
	Announcement of Adjournment of the meeting					

Note: To confirm the minutes of meeting on the same day.



Minutes of the 11th Meeting of the Board of Studies (Computer Science and Information Technology) held on 7th Mar 2024 in Online Mode at 11.00am

Following Members were present for the Meeting:

- 1. Dr. Janardan Pawar
- 2. Dr. Sagar Jambhorkar
- 3. Dr. Vikas Humbe
- 4. Dr. Vilas Wani
- 5. Mr. Chaitanya Chordiya
- 6. Mr. Pratik Phad
- 7. Dr. Pranshant Mulay
- All BSc(Comp. Sci.), BSc(Cyber Security), BCA(Science) and MSc(Comp. Sci.) Faculty Members of IndiraCollege of Commerce and Science, Pune



Indira College of Commerce & Science Tathwade, Pune - 411 033.

Member List of Board of Studies (Computer Science & Information Technology)

Sr.	Num	Category	Nature	Name of the Member	Designation
01	01	Head of the Department	Chairman	Dr. Janardan Pawar	HOD Comp. Sci. & IT
02	39	All BSc(Comp.	Members	Dr.Manisha Manish Patil	
		Sci.), BSc(Cyber		Ms.Sarita Mareppa Byagar	
		BCA(Science) and		Mrs.Jyoti Narayan Shrote	
		MSc(Comp. Sci.)		Mrs.Sarika Yogesh Thakare	
	Faculty Members		Mr.Vijay Daulatrao More		
				Dr.Chandrashekhar B. Pawar	
				Mr.Ninad Narayan Thorat	
				Mrs.Kavita Yogesh Dhakad	
				Mrs.Shital Sameer Pashankar	
				Mr.Ghalme Shantilal Tukaram	-
				Mrs.Madhavi Satish Avhankar	-
				Mr.Prajwal Vitthal Bhalsing	-
				Mr.Ramdas Sanjay Bolage	-
				Mr. Rajminar Devidas Navgire	-
				Mrs.Gouri Amo Vaidya	-
				Mr.Ravindra Arjun Sarje	
				Ms.Suwarna Suresh Kedari	-
				Mr.Avinash Chandrakant Shingte	-
				Mr.Prashant Rajaram Sawant	
				Dr.Sumedh Digamber Gaikwad	Assstant Professor
				Mr. Sharon Manmothe	
				Mr.Valmik Kashinath Dhanwate	
				Mrs.Ashwini Sachin Shivane	
				Mrs.Awantika Narendra Bijwe	
				Dr. Moushmi Pratap Dhumal	-
			Mrs.Jyoti Dashrath Shendas	Mrs.Jyoti Dashrath Shendage	-
		Mrs.Aparna Ashy	Mrs.Aparna Ashwin Jagtap	-	
			Mrs.Shilpa Suhas Pawale Mr.Santosh Dnyanoba Kakde	Mrs.Shilpa Suhas Pawale	-
		9		Mr.Santosh Dnyanoba Kakde	-
			· · .	Mrs.Dhanashri Sandip Kulkarni	-
			Mi	Mrs.Shweta Amol Bhovate	-
				Mrs.Varsha Narayanrao Ikhe	-
				Mrs.Monali Milind Chaudhari	-
				Ms.Deepali Devram Chaudhari	-
				Mr.Mohit Baban Shevkar	
				Mrs. Jyoti Ramchandra Jadhav	-
	1.1			Mr. Santosh Kakade	-
				Mrs. Bhakti Shinde	
				Mrs. Hemangi Rane	
				Mrs. Bhakti Shinde Mrs. Hemangi Rane	

03	02	Two Subject expert from outside Paren University		Dr. Sagar Jambhorkar	Assistant Professor, National Defense Academy, Pune
				Dr. Vikas Humbe	Associate Professor , Director of SRTM University, Latur, Sub-center
04	01	One Expert	Nominated by the Vice-Chancellor from a panel of six recommended by the Autonomous College Principal	Dr. Vilas Wani	HOD, Waghire College, Saswad
05	01	One Representative from Industry	Nominated by Principal	Mr. Chaitanya Chordiya	Technical Head Lead Product Development Harman Connected Services
06	01	College Alumnus	Nominated by Principal	Mr. Pratik Phad	Cyber Security Analyst, Systools
07	01	Expert from outside the Autonomous College	whenever specia courses of studies are to be formulated to be nominated by the principal	Dr. Pranshant Mulay	Vice Principal. Annasaheb Magar College, Pune

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11th Board of Studies (BOS) Meeting

(Computer Science and Information Technology)

Welcome of all BOS Members

The Honorable Chairman, *Dr. Janardan Pawar* welcomed all the members of the BOS in Computer Science and Information Technology constituted as per the guidelines of UGC for autonomous Institutes and approved by Savitribai Phule Pune University.

Item No. Mar-2024/03/62: Discussion about the minutes of 10th BOS meeting held on 24th Feb 2024

Discussion: *Mrs. Gouri Vaidya* gave a brief summary of minutes of 10th BOS meeting which was heldon 24th Feb 2024.

Proposed by : Mrs. Gouri Vaidya Seconded by : Dr. Janardan Pawar

Resolution: All BOS members had unanimously approved the same.

Item No. Mar-2024/03/63 : To Discuss and Seek approval for the additional division of

Master of Science (Computer Science) with 30 seats.

Discussion: Briefing the above item, *Mrs. Gouri Vaidya* informed the members that for M.Sc.(Computer Science) need to increase 30 additional seats.

Proposed by : Mrs. Gouri Vaidya Seconded by : Dr. JanardanPawar

Resolution: All BOS members had unanimously approved the same.

Item No. Mar-2024/03/64 : To Discuss and Seek approval for the new program Bachelor of Science (Data Science) Program, Structure, Syllabus of Sem-I.

Discussion: Briefing the above item, *Mrs. Kavita Dhakad* explained the members that eligibility criteria, Program structure and Syllabus of the Semester-1 of the B.Sc. (Data Science).

Proposed by : Mrs. Kavita Dhakad Seconded by : Dr. Janardan Pawar



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Shree Chanakya Education Society's Indira College of Commerce and Science Pune

Program Code: UG 12 Bachelor of Science (Data Science) (Under Faculty of Science)

A.Y: 2024 - 25



'Dhruv', 89/2A, New Pune-Mumbai Highway, Tathwade, Pune – 411033 Tel: +91-20-66759400, +91-20-66759507/515/637, +91-20-66759502/504



Shree Chanakya Education Society's

INDIRA COLLEGE OF COMMERCE AND SCIENCE

"Empowering Minds to Elevate Lives"

Affiliated to Savitribai Phule Pune University, 'NAAC-A" Accredited & Autonomous Status by UGC, New Delhi,

Name of Program: Bachelor of Science (Data Science)

Introduction:

B.Sc. (Data Science) is a Four Years Full Time Graduate Program. It is a career-focused program designed to equip you with latest technologies and various programming skills and become an expert in the Information technology field.

Program Structure:

- The Program is of a Four Year (Eight semesters) Full Time Degree Program.
- The Program shall be based on credit system comprising 172 credits.

Eligibility Criteria:

- Applicants need to have passed 12th standard i.e. HSC (10+2) or equivalent examination in the Science stream with Mathematics and has secured 40% marks.
- Three Years Diploma Courses, after S.S.C. (10th standard) of Board of Technical Education conducted by the Government of Maharashtra or its equivalent.
- English Language Proficiency.

Intake : 80 Seats.

Medium of Instruction: English

Instructions for Teachers for Internal Evaluation for 30 Marks and 15 Marks: The purpose of internal evaluation is to assess the depth of knowledge, understanding and awareness. For this purpose, a teacher is expected to use different evaluation methods in order to have rational and objective assessment of the learners and available resources.

External Examination:

There will be written Examination of 70 marks of 2.5 hrs. duration and 35 marks of 2 hrs. for every course at the end of each Semester only for major and minor subjects.

Award of Class:

- ✓ Grade O: 9.5 CGP and above
- ✓ Grade A+: 8.25 <= CGPA <= 9.5
- ✓ Grade A: 6.75 <= CGPA <= 8.25
- ✓ *Grade B+:* 5.75 <= CGPA <=6.75
- ✓ *Grade B:* 5.25 <= CGPA <=5.75
- ✓ Grade C: 4.75 <= CGPA <=5.25
- ✓ *Grade D:* 4 <= CGPA <=4.75



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Question Paper Pattern:

Question No.	Question	No. of sub questions	Marks to each sub question	Total Question Marks
1	Attempt any 8	10	2	16
2	Attempt any 4	5	5	20
3	Attempt any 4	5	5	20
4	Attempt any 2	3	7	14
	Total M	larks:		70

	Max. Marks: 35 (Credit 2, Duration: 2 Hrs.)										
Question No.	Question No. of sub questions		Marks to each sub question	Total Question Marks							
1	Attempt any 4	06	2	08							
2	Attempt any 2	03	5	10							
3	Attempt any 3	04	4	12							
4	Attempt any 1	02	5	05							
	Total M	larks:		35							



B.Sc. Data Science Curriculum& Syllabus

Programme Educational Objectives (PEOs)

The B.Sc. Data Science program describe accomplishments that graduates are expected to attain within five to seven years after graduation.

PEO1	Students will excel with professional skills, fundamental knowledge, and advanced innovative technologies to become Data Engineer, Data Scientists, Data Analyst, AI Research Scientists, or Entrepreneurs.
PEO2	Students will establish their knowledge by adopting Data Science Technologies to solve domain specific problems with accurate, thoughtful solutions.
PEO3	Students will engage in lifelong learning to excel in their profession with social and ethical awareness and responsibility.

Programme Specific Outcomes (PSOs)

After th expecte	ne successful completion of B.Sc. Data Science program the students are ed to
PSO1	Design, develop, implement and apply Analytical skills related to Research and Real-world problems in various domains.
PSO2	Apply tools and techniques to provide effective solutions in the multidisciplinary field.
PSO3	Critique the role of data and analytics for a pioneering career, research and consultancy.

	Programme Outcomes (POs)
On suc	cessful completion of the B.Sc. Data Science students will be able to
P01	Apply analytical and critical thinking to identify, formulate, analyse, and solve real-world problems to provide authenticated conclusions
PO2	Exhibit sophisticated, autonomous critical inquiry, analysis, and reflection on modern computing and advanced statistical methods.
P03	Possess a versatile skill set that may be applied to a variety of roles in both national and international organizations like the information technology industry, and other fields.
P04	Create and put into practice data analysis plans based on theoretical principles, ethical considerations, and a thorough understanding of the underlying data and its consequences within the context from which the data was taken.
P05	Be critical and creative thinkers, with an aptitude and appreciation for continued self-directed learning in the evolving world of data science, artificial intelligence and social media
PO6	Design and develop research-based solutions for complex problems with specified needs with appropriate ethical consideration for public health, safety, culture, society, and the environment.
P07	Establish the ability to listen, read, proficiently communicate and articulate data and information through traditional and digital channels to audiences with diverse perspectives
P08	Articulate and evaluate appropriate legal and ethical standards pertaining to all forms of communications, network security and human rights.
P09	Showcase an understanding of the interdisciplinary nature of data, information and community and its influence innovation and progress within the current national or international context
P010	Be able to initiate and implement constructive change in their communities with their skills in data and information, including various professions and workplaces

SEMESTER 1											
Course Type	Course	Course Code	Course/Paper Title	Hours/ Week	Cred it	CIA	ES E	Tot al			
Major	Major Paper 1 (theory)	BDS- 101	Problem Solving using C Programming	4	4	30	70	100			
(4+2)	Major Paper 2 (theory)	BDS- 102	Data Base Management System	2	2	15	35	50			
Major Electives			~	~	~	~	~	~			
Minor	~		~	~	~	~	~	~			
OE (2+2)		BDS- 103	Commerce Basket	2		15	35	50			
		BDS- 104	Management Basket	2		15	35	50			
VSC (2)	Major Specific Practical 1	BDS- 105	Computer Laboratory based on Problem Solving using C Programming and Data Base Management System	2	2	15	35	50			
SEC (2)	Skill Paper 1	BDS- 106	Mathematical Foundations for Data Science	2	2	15	35	50			
AEC (2)	English Theory	BDS- 107	Technical English-I	2	2	15	35	50			
VEC (2)	EVS Theory	BDS- 108	Environmental Science	2	2	15	35	50			
IKS (2)	Major Specific Theory	BDS- 109	Vedic Mathematics	2	2	15	35	50			
CC (2)	CC Course 1	BDS- 110	Health and Wellness, Yoga education, Sports and Fitness, Cultural Activities, NSS/NCC and Fine /Applied/ Visual/Performing Arts	2	2	50	~	50			
And Indexed	Contraction of the	Total	Sector States and the sector of the sector	22	22	200	350	550			





	Section 1999	in the second	SEMESTER 2	1.1.1				
Course Type	Course	Course Code	Course/Paper Title	Hour s/ Week	Cred it	CIA	ESE	Total
	Major Paper	BDS- 201	Section-I: Introduction to Data Science	2	2	15	35	50
Major Mandatory (4+2)	3 (theory)	BDS- 202	Section-II: Introduction to R Programming	2	2	15	35	50
(1.2)	Major Paper 4 (theory)	BDS- 203	Descriptive Statistics	2	2	15	35	50
Major Electives	~			~	~	~		-
Minor	Minor Paper 1	BDS- 204	Matrix Algebra	2	2	15	35	50
OE (2+2)		BDS- 205	Commerce Basket	2		15	35	50
		BDS- 206	Management Basket	2	4	15	35	50
VSC (2)	Major Specific Practical 2	BDS- 207	Practical Based on Introduction to R Programming and Descriptive Statistics	2	2	15	35	50
SEC (2)	Skill Paper 2	BDS- 208	SEC: Data Security and Privacy	2	2	15	35	50
AEC (2)	English Theory	BDS- 209	AEC: Technical English-II	2	2	15	35	50
VEC (2)	EVS Theory	BDS- 210	VEC: DEMOCRACY, ELECTION AND GOVERNANCE	2	2	15	35	50
IKS (2)	~	~	~	~	~			640 B
CC (2)	CC 2 Course	BDS- 211	Health and Wellness, Yoga education, Sports and Fitness, Cultural Activities, NSS/NCC and Fine /Applied/Visual/Performi ng Arts	2	2	50	~ 1	50
		Total		22	22	200	350	550



			SEMESTER 3					
Course Type	Course	Course Code	Course/Paper Title	Hour s/ Week	Credi t	CIA	ESE	Total
Major Mandatory (4+4)	Major Paper 5 (theory)	BDS- 301	Python Programming	4	4	30	70	100
	Major Paper 6 (theory)	BDS- 302	Data Analytics Using R Programming	4	4	30	70	100
Major Electives	~		~	~	~	~	~	•~
Minor	Minor Paper 2	BDS- 303	Linear Algebra in Data Science	4	4	30	70	100
OE (2)		BDS- 304	Commerce Basket or ManagementBasket	2	2	15	35	50
VSC (2)	Major Specific Practical 2	BDS- 305	Practical Based on Python Programming and Data Analytics Using R Programming	2	2	15	35	50
SEC (2)	~	~	~	~	~	~	~	~
AEC (2)	MIL	BDS- 306	Hindi/ Marathi/ Sanskrit Language	2	2	15	35	50
VEC (2)	~	~	~	~	~	~	~	~
IKS (2)	~	~		~	~	~	~	~
FP/CEP (2)	P 1	BDS- 307	FP: Industrial Visits	2	2	15	35	50
CC (2)	CC III	BDS- 308	Health and Wellness, Yoga education, Sports and Fitness, Cultural Activities, NSS/NCC and Fine /Applied/Visual/Performi ng Arts	2	2	50	~	50
		Total		22	22	200	350	550



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			SEMESTER 4		- A-6	1.6		
Course Type	Course Course		se Course Course/Paper Title		Credi t	CIA	ESE	Total
Major Mandator	Major Danan 7	BDS- 401	Section I: Advanced Python Programming	2	2	15	35	50
y(4+2)	Paper /	BDS- 402	Section II: NoSQL Databases	2	2	15	35	50
	Major Paper 8	BDS- 403	Practical Based on Advanced Pythonand NoSQL Databases	4	4	30	70	100
Major Electives	~	~	~ ~ ~ ~		~	~		
Minor	Minor Paper 3	BDS- 404	Artificial Intelligence in Data Science 4 4 30		70	100		
OE (2)		BDS- 405	Commerce Basket or ManagementBasket2215		35	50		
VSC (2)	~	~		~	~	~	~	~
SEC (2)	Skill Paper 3 (Theory)	BDS- 406	Personality Development	2	2	15	35	50
AEC (2)	MIL	BDS- 407	Hindi/ Marathi/ Sanskrit Language	2	2	15	35	50
VEC (2)	~	~		~	~	2	~	~
IKS (2)	~	~		~	~	~	~	~
FP/CEP (2)	CEP 1	BDS- 408	Projects	2	2	15	35	50
CC (2)	CC IV	BDS- 409	Online Certifications (Internet Technology)	2	2	15	35	50
		То	tal	22	22	165	385	550



			SEMESTER 5				and the second	and the second
Course Type	Course	Course Code	Course/Paper Title	Hours / Week	Credi t	CIA	ESE	Total
	Major Paper 9 (theory)	BDS- 501	Object Oriented concepts through Java	4	4	30	70	100
Major Mandatory (4+4+2)	Major Paper 10 (theory)	BDS- 502	Machine Learning	4	4	30	70	100
	Major Paper 11	BDS- 503	Practical based on Object Oriented concepts through Java and Machine Learning	2	2	15	35	50
Major Electives	Elective	BDS- 504	Big Data & Cloud4430Analytics44		70	100		
Minor	Minor Paper 4	BDS- 506	Data Engineering	4	4	30	70	100
OE (2+2)	~	~	~	~	~		~	
VSC (2)	Major Specific Practical 3	BDS- 507	Startups Management	2	2	15	35	50
SEC (2)	~		~	~	~	~	~	~
AEC (2)	~		~	~	~	~	~	~
VEC (2)	~		~	~	~	~	~	~
IKS (2)	~		~	~	~	~	~	~
FP/CEP (2)	FP 2	BDS- 508	Online Certifications (Foreign Language)	2	2	15	35	50
	A Here to	Tota		22	22	165	385	550



			SEMESTER 6					
Course Type	Course	Course Code	Course/Paper Title	Hour s/ Week	Credit	CIA	ESE	Total
Major	Major Paper 12 (theory)	BDS-601	Tools & Techniques for Data Science	4	4	30	70	100
Mandatory (4+4+2) Major Paper 13 (theory) BDS- Major Paper 14(theory) BDS-	Major Paper 13 (theory)	BDS-602	Deep Learning	4	4	30	70	100
	BDS-603	Practical based on Tools & Techniques for Data Science and Deep Learning	2	2	15	35	50	
Major Electives	Elective 3	BDS-604	Real-Time Analytics	2	2	15	35	50
	Elective 4	BDS-605	Social Web Analytics	2	2	15	35	50
Minor	Minor Paper 5	BDS-606	Innovation and Entrepreneurship	4	4	30	70	100
OE (2+2)	~	~	~	~	~	~	~	~
VSC (2)	~		~	~	~	~	~	~
SEC (2)	~		~	~	~	~	~	~
AEC (2)	~		~	~	~	~	~	~
VEC (2)	~		~	~	~	~	~	~
OJT (4)	ојт	BDS-607	Internship	4	4	30	70	100
FP/CEP (2)	~		~	~	~	~	~	~
		Total		22	22	165	385	550



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		5-4	Semester 7					
Course Type	Course	Course Code	Course/Paper Title	Hou rs/ Wee k	Cr	CIA	ESE	Total
Major Mandato ry (2*4+2*2)	Major Paper 15 [Theory] (4)	BDS - 701	Database Technologies (DBT)	4	4	30	70	100
	Major Paper 16 [Theory] (4)	BDS - 702	Design and Analysis of Algorithms	4	4	30	70	100
	Major Paper 17 [Practical] (2)	BDS- 703	Practical course on Database Technologies	4	2	15	35	50
	Major Paper 18 [Practical] (2)	BDS- 704	Functional Language Programming	2	2	15	35	50
Major Electives	Elective (4)	BDS- 705	Cloud computing OR Artificial Intelligence [Theory & Practical]	6	4	30	70	100
RM	Research Methodology (4)	BDS- 706	Research Methodology	4	4	30	70	100
OJT / FP	~		~	~	~	~	~	~
RP	~		~	~	~	~	~	~
		Total		24	20	150	350	500



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			Semester 8					
Course Type	Course	Course Code	Course/Paper Title	Hou rs/ Wee k	Cr	CIA	ESE	Total
Major Mandator y (2*4+2*2)	Major Paper 19 [Theory] (4)	BDS- 801	Mobile Technologies	4	4	30	70	100
	Major Paper 20 [Theory] (4)	BDS- 802	Advanced Operating System(AOS)	4	4	30	70	100
	Major Paper 21 [Practical] (2)	BDS- 803	Practical course on Mobile Technologies	4	2	15	35	50
	Major Paper 22 [Practical] (2)	BDS- 804	Practical course on Advanced Operating System	4	2	15	35	50
Major Electives	Elective (4)	BDS- 805	Azure for Analytics/ Open Course	6	4	30	70	100
RM	~		~	~	~	~	~	~
OJT / FP	Field Project (4)	BDS- 806	Project (OJT)	4	4	30	70	100
RP	~		~	~	~	~	~	~
	Тс	otal		26	20	150	350	500





		Course	Title: - Problem Solving C Course Type: Major Pap Course Code: BDS-10 Semester- I	Using C Pro er1 (Theo 1	ogramming ry)	
Teaching	Scheme		No. of Credits 4		Examina	tion Scheme
4 Hours /	Week				IE: 30 Marks	UE: 70 Marks
The main	objectives:	of this co	urse are to:			
1 To	know abo	ut nrohlei	m solving techniques and a	lgorithm fu	indamentals and	hasics of C
Pro	ogrammin	σ	in solving teeninques and a	igoritanii ie	indumentars and	busies of G
2. To	clearly un	derstand	decision making and branc	hing conce	pts with various	statements
3. To	know abo	ut the con	cept of arrays, strings and	functions v	vith its various of	perations.
4. To	learn abo	ut the con	cept of structure, pointers			
5. To	acquire th	ie knowle	dge of file management			
Expecte	d Course	Outcome	S:			
On the s	uccessful	completi	on of the course, student	will be ab	e:	
201	Define the	e basic coi	ncepts of Problem solving a	ind algorith	nms	K1, K2
20 2	Explain the loops and decision making statements to solve the problem				K2, K3,K4	
:0 3	Apply diff	ferent ope	erations on arrays.			K4,K5
204	Use funct	ions and p	pointers to solve the given p	oroblem		K3
20 5	Discuss a	bout strue	cture and file system and its	s operation	IS	K2,K3,K4
K1 - Ren	nember: K	2 - Under	stand: K3 - Apply: K4 - Ana	lvze: K5 - H	Evaluate: K6 - Cre	ate
	Intr	oduction	to C language			1
UNIT:1	1000	14 18 18 14 14 14 14 14 14 14 14 14 14 14 14 14	0.0			4 Hours
	1.1 Hist	ory				
	1.2 Bas	ic structure	e of C Programming			
	1.5 Cha	racter set	ords and identifiers			
	15 Var	iables and	data types			
	1.6 Ope	rators and	its types			
LINIT 2	Managin	ng I/O on	erations			4 Hours
011112	21 Con	cole based				Filouis
	2.1 Colla	-in 1/0 fun	ctions like printf() scanf() ge	tch() get ch	ar()	
	2.3 Forr	natted inpu	ut and formatted output	(), 8-1		
UNIT-3	Decisio	n Making	a and looning			10 Hours
UNIT.S	31 Intro	duction	ganu tooping			10 11001 5
	3.2 Decis	ion Making	Structure			
	3.2 1. If S	tatement	Source			
	3.2.2 If-e	lse stateme	ent			
	3.2.3 Nes	3.2.3 Nested If-else statement				
	3.2.4 Switch Statement					
	3.3 Conditional Operator					
	3.4 Loop Control Structure					
	3.4.1	While I	000			
	3.4.2	Do-Wh	ile Loop			
	3.4.3 For Loop					
	3.5 Jump Statements					
	3.5.1 Break					
	35.2 Continue					
	3.5.3	Goto			* 25	
	254	Evit				
	1.14	EXIL .				

UNIT 4	Arrays	6 Hours
	 4.1 Introduction to Array 4.2 Types of array 4.2.1 One Dimensional Array 4.2.2 Multi-dimensional Array 	
UNIT 5	Strings	6 Hours
	5.1 Introduction to String5.2 Standard Library Functions5.3 Implementation of String without standard libraries	
UNIT 6	Functions	5 Hours
	 6.1 Introduction to function 6.2 Types of Functions 6.2.1 Call by Value 6.3 Recursion Function 	
UNIT 7	Introduction to pointer	5 Hours
	7.1 Introduction to Pointer 7.1.1 Call by reference 7.2 Dynamic memory allocation	
UNIT 8	Structures	4 Hours
	8.1 Introduction to structure8.2 Accessing structure members8.3 Implementation of structure using functions	
UNIT 9	File Handling	4 Hours
	 9.1 Introduction to File 9.2 File Opening Modes 9.2.1 Read Mode 9.2.2 Write Mode 9.3.3 Append Mode 9.3 Random Access File 	

Text Books (s)		
1	Problem Solving Using C Programming: Vision Prakashan	
2	Problem Solving Using C Programming: Nirali Prakashan	
3	Problem Solving Using C Programming: TechMax Publication	

	Reference Books (s)	
1	Let Us C- Yashwant Kanetkar	
2	Introduction to C programming- Balaguruswamy	
3	A Book on C-AL Kelley	

Related Online Content (MOOCS, SWAYAM, NPTEL, WEBSITES etc)		
1	https://www.w3schools.com/c/c intro.php?external link=true	
2	https://www.programiz.com/c-programming	
3	https://www.geeksforgeeks.org/c-programming-language/	


1	and a second		No. of the second se	CO-	PO MAP	PING				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PC 10
CO 1	S	М	S	М	S	L	L	L	М	M
CO 2	S	S	М	S	L	S	L	М	М	M
CO 3	S	М	S	L	L	М	S	L	S	L
CO 4	S	S	М	L	L	L	М	М	М	
CO 5	S	S	L .	S	М	S	L	S	М	M



	Course Ti Course Co	tle: Database Manager e Type: Major Paper-2 urse Code: BDS-102 Semester- I	ment System (Theory)		
Teaching Scheme Examination 2 Hours / Week No. of Credits 2 IE: 15 Marks					
Course Ob	jectives:	The All March 1995		01.00 1.00	
1 nalysis an 2 atabase aj 3.	The main objective of this co design. To recognize the importance plication and to understand t t also gives the knowledge of t	urse is to enable studen of database analysis and he process of drawing the che roles of transaction	ts to the fundamental concept d design in the implementation he ER-Diagrams. processing and concurrency co	s of database n of any ontrol.	
Expected	Course Outcomes:				
On the su	ccessful completion of the cour	rse, student will be able:			
CO 1	Understand the basic princip	les of database manager	nent systems.	K1, K2	
CO 2	Draw Entity-Relationship dia scenarios	grams to represent simp	ple database application	K2, K3	
CO 3	write SQL queries for a given	context in relational dat	tabase.	K3, K4,K6	
CO 4	Discuss normalization technic	ques with simple examp	les.	K3,K4	
CO 5	Describe transaction process	ing and concurrency con	ntrol concepts.	K3,K4, K6	
K1 - Rem	ember; K2 - Understand; K3 -	Apply; K4 - Analyze; K5	- Evaluate; K6 – Create		
UNIT:1	Database Management Sys	tem		6	
	 1.5 Users of DBMS 1.5.1 Database Designer 1.5.2 Application progra 1.5.3 Sophisticated User 1.5.4 End Users 1.6 Capabilities of good DBM 1.7 Overall System structure 	rs ammer rs 1S			
UNIT 2	Data Models			6	
	 2.1 Introduction 2.2 Data Models 2.3 Entity Relationship Mode 2.3.1 Entity Set 2.3.2 Attribute 2.3.3 Relationship Set 2.4 Entity Relationship Dia 2.5 Extended features of E 	el gram (ERD) RD		-	
UNIT:3	Basic Concepts of Keys and	d Normalization		6	
	3.1 Introduction 3.2 Terms • Relation • Tuple • Attribute • Cardinality • Degree • Domain 3.3 Keys 3.3.1 Super Key 3.3.2 Candidate K 3.3.3 Primary Ke	Key v	PUNE PUNE 411 033.		

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	3.3.4 Foreign Key	
	3.4 Anomalies of unnormalized database	
	3.5 Normalization	
	3.6 Normal Form	
	3.6.1 First Normal Form	
	3.6.2 Second Normal Form	
	3.7 Third Normal Form	
JNIT 4	SQL (Structured Query Language)	1
	4.1 Introduction of SQL	
	4.2 Components of SQL	
	4.2.1 DDL Commands	
	4.2.2 DML Commands	
	4.2.3 DCL Commands	
	4.3 Simple Queries	
	4.4 Nested Queries	
	1.5 Aggregate Functions	
	H.3 Aggregate runctions	

Text Books (s)				
1	Fundamentals of Database Management Systems-By Navathe			
2	Database Management Systems-S.Sudarshan			
3	Fundamentals of Database Management Systems-By Mark Gilleson			

	Reference Books (s)						
1	Database Systems: The Complete Book-Hector Garcia-Molina, Jeff Ullman, and Jennifer Widom						
2	Database Management Systems by Raghu Ramakrishnan and Johannes Gehrke						
3	An Introduction to Database Systems C.J. Date						

	Related Online Content (MOOCS, SWAYAM, NPTEL, WEBSITES etc)
1	https://www.javatpoint.com/dbms-tutorial
2	https://www.techtarget.com/searchdatamanagement/definition/database-management- system
3	https://www.geeksforgeeks.org/dbms/

	and the second		and the	(СО-РО МА	PPING				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	S	S	М	S	М	S	L	L	M	S
CO 2	S	S	L	S	S	S	S	L	S	
CO 3	S	М	S	S	L	M	S	S	L	L
CO 4	S	L	М	M	М	L	М	М	M	
CO 5	M	S	L	S	М	S	L	S	M	M
S: Stro	ng , M: M	edium,	L: Low							



	Course Title: Excel Course Type: Open Electiv Course Code: BDS-103 Semester- I	ve 3	
Scheme / Week	No. of Credits 2	Examination IE: 15 Marks Marks	n Scheme UE: 35
jectives:			
objectives of mine spread dify a works arn to use fur ate and edit er and Sort t use Excel To	this course are to: Isheet concepts and explore the Micros heet and workbook. Inctions and formulas. charts and graphics. cable data. ols for Research Analysis.	oft Office Excel environment.	
d Course Ou	tcomes:		
uccessful con	apletion of the course, student will be at	ole:	
To Demonsti	rate the basic mechanics and navigation	n of an Excel. (Demonstrate)	K1, K2
To Understa	nd how to summarize worksheets and	workbook. (Understand)	K2 K3
To edit work	sheets with advanced enhancement lik	ce Securing workbook, (Apply)	K3, K4,K6
To analyze d	ata using tools like tables and charts. (A	Analyze)	K3 K4
To Evaluate (Evaluate)	the utility of functions and formulas on	excel spreadsheet	K3,K4, K6
To Create Ta	bles and worksheets. (Create)		K6
ember: K2 -	Understand: K3 - Apply: K4 - Analyze:	K5 - Evaluate: K6- Create	KO
Excel Introd	luction		5Hours
1.5 Data For 1.4 Working 1.5 Managin 1.6 Shortcut 1.7 Filtering	with Columns, Rows , Cells and Ranges g Worksheets and Protection. Keys on Text, Numbers & Colors	; in Excel	
Functions			5 Hours
2.1 Basic Fur 2.1.1 Us 2.1.2 Ab 2.2 Mathema 2.2.1 Sur Stateme 2.3 Text Fun 2.3.1 Up 2.3.2 Le 2.3.3 Tri 2.3.4 Co 2.3.5 Fir 2 4 Date and	actions ing Functions – Sum, Average, Max, Min solute, Mixed and Relative Referencing utical Functions mIf, SumIfs, CountIf, CountIfs, AverageI ent, AND, OR, NOT ctions oper, Lower, Proper ft, Mid, Right im, Len, Exact ncatenate ad, Substitute Time Functions day, Now	n, Count, Counta f, AverageIfs, Nested IF, IFERROI	R
	Scheme / Week jjectives: objectives of mine spread dify a works rn to use fur ate and edit er and Sort to use Excel To d Course Ou accessful con To Demonstr To Oundersta To edit work To analyze d To Evaluate (Evaluate) To Create Ta member; K2 - Excel Introd 1.1 Explorin 1.2 Data Ent 1.3 Data Ent 1.3 Data Fori 1.4 Working 1.5 Managin 1.6 Shortcut 1.7 Filtering Functions 2.1 Basic Fur 2.1.1 Us 2.1.2 Ab 2.2 Mathema 2.3.3 Text Fun 2.3.1 Up 2.3.2 Le 2.3.3 Tri 2.3.4 Co 2.3.5 Fir 2.4 Date and 2.4.1 To	Course Title: Excel Course Type: Open Electi Course Code: BDS-10: Semester-1 Scheme / Week No. of Credits 2 bjectives: >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	Course Title: Excel Course Ode: BDS-103 Semester-1 Scheme /Week No. of Credits 2 Examinatio IE: 15 Marks Marks sjectives:

	2.6 Statistical Functions	
	2.6.1 Using The SUMIF / COUNTIF Functions	
ж.,	2.6.2 Using The AVERAGE / COUNT / LARGER / SMALLER Functions	
UNIT:3	DATA ANALYTICAL SKILL OPERATIONS	5 Hours
	3.1 Exploring with Data Tab and Options	
	3.2 Named Ranges in Excel	
	3.3 Data Validation in Excel	
	3.4 Data Sorting and Filtering in Excel	
	3.5 Using Conditional Formatting in Excel	
	3.6 Finding Duplicate value, Consolidation of work	
	3.7 Grouping and Ungrouping of data, Usage of Collapse and Expand Button	
UNIT 4	INTRODUCTION TO EXCEL CHARTING	5 Hours
	4.1 Introduction to Excel Charting	
	4.2 Advanced Excel Charting Examples	
	4.3 Dynamic Charts in Excel	
UNIT 5	Working with Tables	5 Hours
	5.1 Introduction to Excel Tables	
	5.2 Creating table, format table, table styles and table chart option, sparkline cha	art

	Text Books (s)	12.5
1	Excel for Dummies (Excel for Dummies)	
2	Excel: Quick Start Guide from Beginner to Expert (Excel, Microsoft Office)	
3	MS- Office 2000(For Windows) – By Steve Sagman	

14 - 15	Reference Books (s)					
1	Advanced Excel Success: A Practical Guide to Mastering Excel by Murray, Springer India					
2	Advance Excel 2016 Training Guide					
3	Microsoft Excel Bible: The Comprehensive Tutorial Resource					

Same Sails	Related Online Content (MOOCS, SWAYAM, NPTEL, WEBSITES etc)						
.1	https://www.tutorialspoint.com/						
2	https://www.w3schools.						

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	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
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CO 2	S	S	М	L	S	S	М	S	L	S
CO 3	S	M	S	L	S	М	S	S	S	L
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		Course Title: -Licensing & Global Con Course Type: Ope Course Code: BI Semester-I	imercialization-Pa n Elective DS-104	atent 5 an	iu start up)
Feaching 2 Hours	Scheme / Week	No. of Credits 2	IE: 15 N	Examina Marks	tion Scheme UE: 35 Mark
Course Ob	ojectives:		La construction of the second	and the second	
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Expecte	d Course Out	tcomes:	And the second second second	a suller	
Un the st	liccessful com	pletion of the course, student will be able	e:		
1.	To understa	and the Understanding, the Big Picture o	f Patent and Copy R	lights	K2
2	To learn ho	w to file patents.			K.3
2.	To have the	hands-on experience on techniques to r	nove your deal for	vard	K3 K4 K5
K1 - Ren	ember: K2 -	Understand: K3 - Apply: K4 - Analyze: K	5 - Evaluate: K6- C	reate	10,101,103
ne nen	Study and I	Invent for Market Place	io Brandice, no e	reace	5
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	3.8 An image of your product idea	
	3.9 Your one sentence benefit statement The name of your product	
	3.10 "Patent Pending" in tiny letter	
	3.11 Avoid Unnecessary Filler	
	3.12 How To Work With Freelancers to Create Your Sell Sheet	
	3.13 The Power Of Video and How to Create Your Video Sell Sheet When To Sheet	Send Your Sell
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	Text Books (s)					
1	Patent IPR Licensing- Technology Commercialization – Innovation Marketing : Guide Book for					
	Researchers, Innovators					
2	Patent Drafting & Specification Writing					
3	Law Relating To Intellectual Property					

	Reference Books (s)
1	Fundamentals of for Engineers: K.Bansl& P.Bansal •
2	Intellectual property right, Deborah, E. BoDcboux, Cengage leam'ng.
3	Intellectual property right - Unleasbing the knowledge conomy, Pmbuddha Ganguli, Tata Mccraw HiU Publishing Company Ltd

	Related Online Content (MOOCS, SWAYAM, NPTEL, WEBSITES etc)
1	https://www.wipo.int/edocs/mdocs/aspac/en/wipo_ip_han_11/wipo_ip_han_11_ref_t7b.pdf
2	https://www.unr.edu/research-innovation/innovation-hub/patents-commercialization- licensing

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	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
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CO 2	S	S	L	S	S	L	S	L	S	
CO 3	L	S	S	S	S	М	S	L	S	L
CO 4	L	S	М	M	М	М	М	М	M	М
CO 5	М	S	L	S	М	S	L	S	M	



		Course Code: BDS-10	5	
Te 2	eaching Scheme Hours / Week	Semester- I No. of Credits 2	Examination IE: 15 Mar UE: 35 Mar	Scheme ks rks
Course	Objectives: -			
course	1. To understand the r	program development life cycle	The Designation of the	and the second
	 Solve simple compulanguage. Understand basic data Design E-B Model for 	atabase management operations.	design and basic feature	es of the 'C'
Expect	ed Course Outcomes: -	si given requirements and conver	t the same into database	. tables.
CO 1	To understand program	n development life cycle		K2
<u>co 2</u>	To colve problem bace	d on a programming	1	K2
CO 2	To solve problem base	ad on DBMS		K3
CO 4	To design E-R Model w database table	ith the given requirements and al	ble to convert same into	K3,K4
CO 5	To design database wit	h various fields and apply queries	s on database	K4.K5
	Problem Sc	olving using C Programming La	h Course Content	
Practica	Problem So I 1 Introduction to C la command, getch() comma	olving using C Programming La anguage and, printf() and scanf()command	b Course Content d, return command	2
Practica (lrscr() Practica	Problem So Il 1 Introduction to Cla command, getch() comma Il 2 Statement	olving using C Programming La anguage and, printf() and scanf()command	b Course Content	2
Practica Irscr() Practica f statem	Problem So In 1 Introduction to Cla command, getch() command In 2 Statement eent, else statement, if else	olving using C Programming La anguage and, printf() and scanf()command e statement, nested ifstatement , 1	b Course Content d, return command nested if else statement	2
Practica Clrscr() Practica f statem Practica	Problem So In 1 Introduction to Cla command, getch() comma In 2 Statement inent, else statement, if else In 3 Loop	olving using C Programming La anguage and, printf() and scanf()command e statement, nested ifstatement , 1	b Course Content d, return command nested if else statement	2 2 2
Practica Clrscr() Practica f statem Practica For loop	Problem So In 1 Introduction to Cla command, getch() command, I 2 Statement ient, else statement, if else I 3 Loop , while loop, do while loop	olving using C Programming La anguage and, printf() and scanf()command e statement, nested ifstatement , n p and its examples	b Course Content d, return command nested if else statement	2 2 2
Practica Clrscr() Practica f statem Practica For loop Practica	Problem So In 1 Introduction to Cla command, getch() command, Introduction to Cla command, getch() command Introduction Statement, if else Introduction Statem	olving using C Programming La anguage and, printf() and scanf()command e statement, nested ifstatement , n p and its examples	b Course Content	2 2 2 2 2
Practica (Irscr() Practica f statem Practica for loop Practica Predefin	Problem SoIl 1Introduction to Classicacommand, getch() command,Il 2StatementIl 3Statement, if elseIl 3Loop, while loop, do while loopIl 4Functionsed functions, User defined	olving using C Programming La anguage and, printf() and scanf()command e statement, nested ifstatement , i p and its examples d functions, prototypes,return va	b Course Content	2 2 2 2
ractica Irscr() ractica f statem ractica or loop ractica redefin	Problem SecondI 1Introduction to C Iscommand, getch() command,I 2StatementI 2Statementi 3Loop, while loop, do while loopI 4Functionsed functions, User definedI 5Array	olving using C Programming La anguage and, printf() and scanf()command e statement, nested ifstatement , n p and its examples d functions, prototypes,return va	b Course Content	2 2 2 2 2 2
Practica Clrscr() Practica f statem Practica Practica Practica Predefin Practica Dne dim	Problem SoIl 1Introduction to Classicacommand, getch() command,command, getch() commandIl 2StatementIl 3LoopIl 4Loop, while loop, do while loopIl 4Functionsed functions, User definedIl 5Arrayension, two dimension ar	olving using C Programming La anguage and, printf() and scanf()command e statement, nested ifstatement , i p and its examples d functions, prototypes,return va	b Course Content	2 2 2 2 2 2
Practica Clrscr() Practica f statem Practica Predefin Practica Dne dim Practic 6	Problem SecondI 1Introduction to C Iacommand, getch() command,command, getch() commandI 2StatementI 3Loopal 3Loop, while loop, do while loopal 4Functionsed functions, User definedal 5Arrayension, two dimension aralPointer	olving using C Programming La anguage and, printf() and scanf()command e statement, nested ifstatement , n p and its examples d functions, prototypes,return val tray and examples	b Course Content	2 2 2 2 2 2 2 2
Practica Irscr() Practica f statem Practica Practica Practica Ine dim Practic 6 Practic	Problem So Il 1 Introduction to Cla command, getch() command, getch() command, It 2 Statement It else Il 2 Statement, if else Il 3 Loop while loop, do while loop It else statement, if else Il 4 Functions ed functions, User define It else Il 5 Array ension, two dimension are Pointer examples It else	olving using C Programming La anguage and, printf() and scanf()command e statement, nested ifstatement , i p and its examples d functions, prototypes,return va tray and examples	b Course Content	2 2 2 2 2 2 2 2
Practica Clrscr() Practica f statem Practica Predefin Practica Predefin Practica One dim Practic 6 Pointer of Practic	Problem So Il 1 Introduction to Cla command, getch() command, getch() command, It 2 Statement It all 2 Il 2 Statement, if else Il 3 Loop Il 4 Functions Il 4 Functions Il 5 Array ension, two dimension are Pointer examples all Structure	olving using C Programming La anguage and, printf() and scanf()command e statement, nested ifstatement , i p and its examples d functions, prototypes,return va tray and examples	b Course Content	2 2 2 2 2 2 2 2 2 2
Practica Practica f statem Practica f or loop Practica Practica Practica Dne dim Practic 6 Pointer of Practic 7 ftructur	Problem SecondIl 1Introduction to Classicacommand, getch() command,command, getch() commandIl 2StatementIl 3Loopin 3Loop, while loop, do while loopil 4Functionsed functions, User definedil 5Arrayension, two dimension arealPointerexamplesalStructuree ExamplesalNet are with	olving using C Programming La anguage and, printf() and scanf()command e statement, nested ifstatement , n p and its examples d functions, prototypes,return val tray and examples	b Course Content	2 2 2 2 2 2 2 2 2 2
Practica Practica f statem Practica f or loop Practica	Problem SoIl 1Introduction to Clacommand, getch() command,command, getch() commandIl 2StatementIl 3Loopin 4Functionsin 4Functionsed functions, User definedIl 5Arrayension, two dimension arealPointerexamplesalStructuree ExamplesalFile Handling	olving using C Programming La anguage and, printf() and scanf()command e statement, nested ifstatement , i p and its examples d functions, prototypes,return va tray and examples	b Course Content	2 2 2 2 2 2 2 2 2 2 2 2 2
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Practica Practica f statem Practica f or loop Practica	Problem So Il 1 Introduction to Cla command, getch() command, getch() command, Il 2 Statement, Il 3 Loop uent, else statement, if else Il 3 Loop while loop, do while loop while loop, do while loop uent, else statement, if else Il 4 Functions ed functions, User defined Il 5 Array ension, two dimension ar al Pointer etaamples al Structure al file Handling Databa	olving using C Programming La anguage and, printf() and scanf()command e statement, nested ifstatement , i p and its examples d functions, prototypes,return va tray and examples etc(), fputc(),fscanf(),Random ac ase management system Lab Co	b Course Content	2 2 2 2 2 2 2 2 2 2 2 2
Practica Practica f statem Practica or loop Practica Practica Practica De dim Practic 6 Practic 7 tructur Practic 8 open(), 1. C	Problem So Il 1 Introduction to Cla command, getch() command, getch() command, Il 2 Statement Il 3 Loop Il 4 Functions get functions, User defined Il 5 Array ension, two dimension ar al Pointer examples al Structure Databa al File Handling of close(), fprintf(),eof(),fg Databa	olving using C Programming La anguage and, printf() and scanf()command e statement, nested ifstatement , i p and its examples d functions, prototypes,return va tray and examples etc(), fputc(),fscanf(),Random ac ase management system Lab Co ut constraints	b Course Content	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Practica Practica f statem Practica Practi	Problem So Il 1 Introduction to Cla command, getch() command, Getch() command, Il 2 Statement, Il 3 Loop uent, else statement, if else Il 3 Loop while loop, do while loop while loop, do while loop uent, while loop, do while loop uent, else statement, if else else statement, if else uent, else statement, if else else statement, else statement, if else else statement, if else else statement, if else else statement, if else else statement, else statement, if else else statement al File Handling else statement	olving using C Programming La anguage and, printf() and scanf()command e statement, nested ifstatement , i p and its examples d functions, prototypes,return va tray and examples etc(), fputc(),fscanf(),Random ac ase management system Lab Co ut constraints nstraints	b Course Content	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

4. Basi	Basic DML queries	
5. DMI	DML queries with aggregate functions	
6. Nest	ed queries and queries with join	2
	Text Books (s)	
1	Problem Solving Using C Programming: Vision Prakashan	
2	Problem Solving Using C Programming: Nirali Prakashan	
3	Problem Solving Using C Programming: TechMax Publication	

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and the second second	Reference Books (s)
1	Fundamentals of data structures – Ellis Horowitz and Sartaj Sahni
2	Data Structure Using C - Radhakrishanan and Shrivastav.
3	Data Structure Using C and C++ - Rajesh K. Shukla ,Wiley -India

and the second	Related Online Content (MOOCS, SWAYAM, NPTEL, WEBSITES etc)					
1	https://www.w3schools.com/c/c_intro.php					
2	https://www.geeksforgeeks.org/c-language-introduction					
3	https://www.tutorialspoint.com/dbms/index.htm					

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	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO
										10
CO 1	S	S	М	S	М	М	S	М	S	S
CO 2	S	L	S	L	S	S	S	S	L	S
CO 3	M	S	S	S	S	М	S	S	S	
CO 4	S	М	М	M	М	L	М	М	M	М
CO 5	L	S	L	S	М	S	L	S	M	M
S: Strong	, M: Medi	um , L: Lo	w							

PUNE 411 033

		Course Title: : Mathematic Course Type: SEC (2) S Course Code: BDS- Semester- I	cal Foundations Skill paper 1 106					
Teaching		No. of Credits 2	Examinati	ion Scheme				
Scheme 4		No. of circuits 2	IE: 15 Marks	UE: 35 Marks				
Hours / W	eek							
The main oh	iectives of th	is course are to:						
1. To un 2. To ge 3. To un 4. To ac	derstand of l t knowledge derstand pro quire concep	Mathematical logic to implement in of set. oblems on relation and function. ts of probability to use further in so	industry ftware industry					
Expected (Course Outco	omes:						
On the succ	cessful compl	etion of the course, student will be a	ble:	· · · ·				
То	understand	role and importance of Fundamenta	al mathematics in various					
CO 1 bu	siness situati	ions		K2				
То	davelon skil	le related with basic mathematical t	ochnique	and engine				
CO 2 10	To implement mathematics in software industry.							
CO 3 To	To implement mathematics in software industry.							
CO 4 To	To solve the problem by use of mathematical technique in real time							
Co.5 To	To acquire concepts of probability to use further in software industry							
	acquire con	cepts of probability to use further if	i soltware industry	K3,K4,K5				
KI - Kemer	inder; K2 - 01	iderstand; K3 - Apply; K4 - Analyze;	, KS - Evaluate; KO- Create					
UNIT: 1 MA	ATHEMATIC	AL LOGIC		6 Hours				
1.	1 Propositio	n	9					
1.	2 Logical Cor	nnectives						
1.	3 Propositio	nal Forms						
1.	4 Truth Tabl	e						
1.	5 Tautology,	Contradiction, Contingency	a					
1.	6 Converse, l	nverse and Contrapositive of condi	tional statement					
UNIT:2 SE	TS, RELATIO	ONS AND FUNCTIONS		9 Hours				
2.	1 Introductio	on to Sets						
2.	2 finite and I	nfinite sets						
2.	3 Relations							
2.	4 Properties	of Binary relations						
2.	5 Closure, Ec	uivalence Relation, Partial Ordering	g Relations					
2.	6 Functions		E.					
UNIT:3 CO	UNTING PR	INCIPLES		5 Hours				
3	1 Counting P	igeonhole Principle	Contraction of the second second	the second second				
3	2 Permutatio	on and Combination						
3.	3 Mathemat	ical Induction						
3.	4 Principle o	of Inclusion and Exclusion						
UNIT:4 IN	TRODUCTIO	N TO GRAPHS		10 Hour				
4	1 Introductio	ons to Graph Theory	ol Comp					
			PUMP	1				
		Page 2 of 32	(S 411 033.)	a a				
				/				

4.2	Basic	Termino	logy,	Types	of	graphs	5
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4.3 Multigraphs and weighted graphs

4.4 Graph Representation

4.5 Graph Isomorphism

4.6 Connectivity

4.7 Euler and Hamiltonian Paths and Circuits

4.8 Planar Graphs

4.9 Graph Coloring

Total

30 Hours

	Text Book(s)
1.	Mathematics for BCA-R.K. Rajput
2.	Elements of Mathematics-Dr.Dalip Kumar
3.	MATHEMATICS VOLUME-1-Chauhan P

	Reference Books
1.	Elements of Discrete Mathematics, By C. L. Liu (Tata McGraw Hill
2.	A First Look at Graph Theory, By John Clark and Derek Holton, (Allied Publishers)
3.	Graph Theory with Applications to Computer Science and Engineering , Narsingh Deo

	Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1.	https://discrete.openmathbooks.org/dmoi3.html	
2.	https://www.youtube.com/watch?v=p2b2Vb- cYCs&list=PLBlnK6fEyqRhqJPDXcvYlLfXPh37L89g3	

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	P01	PO2	P03	P04	PO5	P06	P07	P08	P09	P010
CO1	S	S	L	S	М	S	S	L	S	
CO2	S	М	S	М	S	L	М	S	S	
CO3	М	S	S	S ·	S	М	S	S	S	L
CO4	М	S	М	М	М	L	М	М	М	S
CO5	L	L	L	S	М	S	L	S	М	



Teach 2 Ho Course Ob 1. To f 2. To e	hing Scheme ours / Week	No. of Credits 2				
1. To f 2. To e	2 Hours / Week IE: 15 Marks UE: 35 Marks ourse Objectives: -					
1. To f 2. To e	jectives: -				in the second	
 To a To a Skil 	familiarize and to und enhance the LSRW ski acquaint and familiari minimize the gap betw lls they require at pro	erstand English language. lls in English language of the stude ze the students with advanced wr veen the existing communicative s fessional level	ents iting skills in o skills of the stu	different contexts adents and the		
Expected (Course Outcomes: -	n Mag and and a second				
СО1 То	o develop competency	to understand English language a	and developco	mmunication skil	К3	
СО 2 То	o enhance vocabulary	and grammar skills.			K3,K4	
СОЗ То	o interpret English lan	guage.			K4	
CO 4 To	o develop conversatio	n skills.			K5	
CO 5 To	o develop writing skil	S.			K5	
K1 - Remen	nber; K2 - Understand	l; K3 - Apply; K4 - Analyze; K5 - Ev	valuate; K6 - (Create		
		Course Contents		Lingues and - Leader - and a		
Unit 1	1 Introduct	ion to Communication		10		
		3.1				
	Chapter-2 2.1 Bar Chapter-3 3.1 D 3.2 P	riers to communication eveloping Listening Skills (Podcas	sts, Ted talks e	etc.)		
Unit	2 Conversati	on Skills	CRAME AND	8	-	
Iluit	Chapter -1 1.1 lr Chapter-2 2.1 D Chapter-3 3.1 E Chapter-4 4.1 Co Writing S	atroduction (Self and to others) escription of daily routine and thin expressing Apologies and Gratitude onversation at various occasions (ngs around e and shortres 2 Formal and	sponses 2 Informal situatio	ons)	
Unit .	Chapter-1 i. Job ii. Let	Technical Writing Skills Application Letter and Resume W ter Writing (Business Letter)	riting	0		
Unit 4	4 Grammar			6		
×	Chapter-1 i. Dev ii. For iii. Edit	eloping Vocabulary mation of Sentences ing short Paragraph	PI PI	Commerce UNE		

Text Books (s)					
1	Effective Technical Communication -M. Ashraf Rizvi.				
2	Basic Technical English Student's Book -Jeremy Comfort.				
3	Technical English-By S Sumant				

	Reference Books (s)
1	Raman, Meenakshi & Sangeeta Sharma. Technical Communication: Principles and Practice.Second Edition. New Delhi: Oxford University Press, 2011.
2	Rutherford, Andrea J. Basic Communication Skills for Technology: Second Edition. Delhi:Pearson Education, 2007.
3	Interactive Grammar & Writing Skills Book- Seth Publications

	Related Online Content (MOOCS, SWAYAM, NPTEL, WEBSITES etc)	
1	https://www.investopedia.com/terms/s/soft-skills.asp	
2	https://www.linkedin.com/pulse/introduction-soft-skill-surabhi-kulshrestha	
3	https://www.vedantu.com/english/writing-skills	

	Call Cheek		EX-FUEL A	CO-I	PO MAPPI	NG	AN RESIDENCES	Sector Property and		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P0 7	PO 8	PO 9	PO 10
CO 1	S	S	S	M	S	S	М	S	M	М
CO 2	M	L	S	L	L	S	L	S	S	S
CO 3	S	L	S	S	S	М	S	S	S	L
CO 4	M	M	М	М	М	L	М	М	M	М
CO 5	S	S	L	S	М	S	I.	S	M	M
: Strong	M: Medi	um , L: Lo	w							



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		Course Title: - Environmental Sc Course Type: VEC (2) -EVS Theo Course Code: BDS-108	cience ory							
Te 2	eaching Scheme Hours / Week	No. of Credits 2	Examination Sch IE: 15 Marks UE: 35 Marks	Examination Scheme IE: 15 Marks UE: 35 Marks						
Course	Objectives: -									
	 To familiarize a To enhance the To acquaint an To minimize th they require at 	nd to understand English language. LSRW skills in English language of t d familiarize the students with advar e gap between the existing communi professional level	he students need writing skills in different icative skills of the students a	contexts nd theskill						
Expecte	ed Course Outcomes: -									
CO 1	To develop competend skills.	Γο develop competency to understand English language and developcommunication skills.								
CO 2	To enhance vocabular	y and grammar skills.		K1,K2						
CO 3	To interpret English la	nguage		K2						
04	To develop conversati	on skills.		K3,K4						
K1 - Rer	nember: K2 - Understar	nd: K3 - Apply: K4 - Applyze: K5 - Fy:	aluate: K6- Create							
in ner	includer, the onderstal	Course Content	independent of cure	A. Maria						
Unit 1	Introduction to	environmental studies		2						
Unit 2	1.1 Multidisciplin 1.2 Scope and im 1.3 Concept of su Ecosystems	ary nature of environmental studies portance stainability and sustainabledevelopn	nent	8						
	2.2 What is an ec	osystem?								
	2.3 What is an ec	osystem?								
	2.3 Energy flow i	2.3 Energy flow in an ecosystem: food chains, food webs and ecological succession.								
	2.4 Case studies	2.4 Case studies of the following ecosystems								
	2.4.1 Forest e	2.4.1 Forest ecosystem								
	2.4.2 Grasslar	2.4.2 Grassland ecosystem								
	2.4.3 Desert e	2.4.3 Desert ecosystem								
11.1.1	2.4.4 Aquatic	2.4.4 Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries								
Unit :	a waturai kesour	ces, kenewable and Non-renewal	dation coil encience data	Gentler						
	3.1 Land resource	es and land use change; Land degra	uation, soll erosionand desert	incation.						
	5.2 Deforestatio	3.2 Deforestation: Causes and impacts due to mining, dam building on								
	3.3 Water: Use a	nd over-exploitation of surface and	ground water, floods, drough	S						
	conflicts or	verwater (international & inter-state	e).							
	3.4 Energy resou	arces : Renewable and non-renewab	ole energy sources, use of alte	rnate						
	energy sou	rces, growing energy needs,case stu	dies	0						
Unit 4	Biodiversity an	Biodiversity and Conservation 1								
	4.1 Levels of bio	ological diversity: genetic, species and	d ecosystem diversity; Biogeo al biodiversity bot spots	graphic						
	zones of	nula; biourversity patterns anugloba	a blouiversity not spots							

	4.2 India as a mega-biodiversity nation; Endangered and endemic species of India
	4.3 Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts,
	biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
	4.4 Ecosystem and biodiversity services : Ecological, economic, social, ethical, aesthetic and informational value

	Text Books (s)						
1	Environmental Science- Bharti Publications						
2	Introduction to Environmental Science- G. Tyler Miller, Scott Spool man						
3	A Text Book Of Environmental Science by P. C. Joshi						

idean the in	Reference Books (s)
1	Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
2	Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
3	Odum, E.P., Odum, H.T. & Andrews. 1971. Fundamentals of Ecology. Philadelphia: Saunders.

	Related Online Content (MOOCS, SWAYAM, NPTEL, WEBSITES etc) 1 https://en.wikipedia.org/wiki/Environmental_science 2 https://scse.d.umn.edu/about/departments-and-programs/earth-environmental-science	
1	https://en.wikipedia.org/wiki/Environmental_science	
2	https://scse.d.umn.edu/about/departments-and-programs/earth-environmental-sciences- department/what-earth-environmental	
3	https://www.earth.com/earthpedia-articles/environmental-science/	

"New med	CO-PO MAPPING										
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	
CO 1	S	S	S	M	М	S	М	М	S	S	
CO 2	S	M	L	S ·	S	S	L	S	S	L	
CO 3	M	M	S	L	L	M	S	S	S	L	
CO 4	M	S	М	M	М	L	М	М	M	M	
CO 5	L	L	L	S	M	S	L	S	M	M	
: Strong	, M: Medi	um , L: Lo	w								

		Course Type: (IKS 2) Major Course Code: BDS-10 Semester- I	Specific Theory 9				
Teac 2 He	hing Scheme ours / Week	No. of Credits 2	Examination IE: 15 Mar UE: 35 M	Scheme rks arks			
Course O	bjectives: -	Set Load attention of the	bs.				
1. To	enable the learners to	explore the power of Vedic Mat	hs.				
2. To	make learners strong i	in Numerical Maths.					
3. To	enable learners to reco	ognize and understand simple to	echniques of Arithmetic	Calculations.			
4. To	train learners to use th	ne ideas of Vedic Maths in daily	calculations and make t	hose calculati			
wi	thaccuracy and speed						
Expected	Course Outcomes: -						
1 To	Understand simple ari	thmetic calculations with speed	and accuracy	K2			
2 To	To generate tables of any number						
3 To	Evaluate products of la	rge numbers quickly		K3,k4,k5			
4 To	Develop confidence in	calculating square roots and cu	be roots of integers	K5			
5 To	5 To Perform difficult calculations speedily						
K1 - Rem	ember; K2 - Understan	d; K3 - Apply; K4 - Analyze; K5	- Evaluate; K6 – Create				
web xolu a		Course Content		in the second			
Unit 1	Two Simple Tech	niques		3			
Unit 2	Case, Series of 1.2 Comparison of S Basic Techniques 2.1 Various techniq	f 9, Series of 1 etc.), Tables etc Standard Methods with Vedic M s-I jues to carry out basic operation	ethods.	5 btraction,			
Unit 2	Case, Series of 1.2 Comparison of S Basic Techniques 2.1 Various techniq Multiplication, I 2.2 General multip	f 9, Series of 1 etc.), Tables etc Standard Methods with Vedic M s-I jues to carry out basic operation Division, Complements and Bas plication (Vertically Cross-wise	ethods. ns covering Addition,Su es,).	5 btraction,			
Unit 2	Case, Series of 1.2 Comparison of S Basic Techniques 2.1 Various techniq Multiplication, I 2.2 General multip 2.3 General divisit Basic Techniques	f 9, Series of 1 etc.), Tables etc Standard Methods with Vedic M s-I ues to carry out basic operation Division, Complements and Bas plication (Vertically Cross-wise ion s-II	ethods. ns covering Addition,Su es,).	5 btraction,			
Unit 2 Unit 3	Case, Series of 1.2 Comparison of S Basic Techniques 2.1 Various techniq Multiplication, I 2.2 General multip 2.3 General divisi Basic Techniques 3.1 Multiplications	f 9, Series of 1 etc.), Tables etc Standard Methods with Vedic M s-I ues to carry out basic operatio Division, Complements and Bas plication (Vertically Cross-wise ion s-II s by numbers near base	ethods. ns covering Addition,Su es,).	5 btraction, 6			
Unit 2 Unit 3	Case, Series of 1.2 Comparison of S Basic Techniques 2.1 Various techniq Multiplication, I 2.2 General multiplications Basic Techniques 3.1 Multiplications 3.2 Verifying answ	f 9, Series of 1 etc.), Tables etc Standard Methods with Vedic M s-I ues to carry out basic operation Division, Complements and Bas plication (Vertically Cross-wise ion s-II s by numbers near base, vers by use of digital roots.	ethods. ns covering Addition,Su es,).	5 btraction, 6			
Unit 2 Unit 3	Case, Series of 1.2 Comparison of S Basic Techniques 2.1 Various techniq Multiplication, I 2.2 General multiplications Basic Techniques 3.1 Multiplications 3.2 Verifying answ 3.3 Divisibility test	f 9, Series of 1 etc.), Tables etc Standard Methods with Vedic M s-I ues to carry out basic operation Division, Complements and Bas plication (Vertically Cross-wise ion s-II s by numbers near base, vers by use of digital roots, ts	ethods. ns covering Addition,Su es,).	5 btraction, 6			
Unit 2 Unit 3	Case, Series of 1.2 Comparison of S Basic Techniques 2.1 Various techniq Multiplication, I 2.2 General multiplications Basic Techniques 3.1 Multiplications 3.2 Verifying answ 3.3 Divisibility test 3.4 Division of nur	f 9, Series of 1 etc.), Tables etc Standard Methods with Vedic M s-I ues to carry out basic operation Division, Complements and Bas plication (Vertically Cross-wise ion s-II s by numbers near base, vers by use of digital roots, ts mbers near base	ethods. ns covering Addition,Su es,).	5 btraction, 6			
Unit 2 Unit 3	Case, Series of 1.2 Comparison of S Basic Techniques 2.1 Various techniq Multiplication, I 2.2 General multiplications Basic Techniques 3.1 Multiplications 3.2 Verifying answ 3.3 Divisibility test 3.4 Division of nur 3.5 Comparison of f	f 9, Series of 1 etc.), Tables etc Standard Methods with Vedic M s-I ues to carry out basic operation Division, Complements and Bas plication (Vertically Cross-wise ion s-II s by numbers near base, vers by use of digital roots, ts mbers near base ractions	ethods. ns covering Addition,Su es,).	5 btraction, 6			
Unit 2 Unit 3 Unit 4	Case, Series of 1.2 Comparison of S Basic Techniques 2.1 Various techniq Multiplication, I 2.2 General multiplications 3.3 General divisit Basic Techniques 3.1 Multiplications 3.2 Verifying answ 3.3 Divisibility test 3.4 Division of nur 3.5 Comparison of f	f 9, Series of 1 etc.), Tables etc Standard Methods with Vedic M s-I ques to carry out basic operation Division, Complements and Bas plication (Vertically Cross-wise ion s-II s by numbers near base, vers by use of digital roots, ts mbers near base ractions	ethods. ns covering Addition,Su es,).	5 btraction, 6			
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Unit 2 Unit 3 Unit 4 Unit 5 Unit 6	Case, Series of 1.2 Comparison of S Basic Techniques 2.1 Various techniq Multiplication, I 2.2 General multip 2.3 General divisi Basic Techniques 3.1 Multiplications 3.2 Verifying answ 3.3 Divisibility test 3.4 Division of nur 3.5 Comparison of f Vinculum number 4.1 Vinculum num 4.2 Applications of Vi Square roots and 5.1 Different mether etc.) 5.2 Square roots 5.3 Cubes 5.4 Cube roots Numerical Aptit 6.1 Quadratic Equations	f 9, Series of 1 etc.), Tables etc Standard Methods with Vedic M s-I ques to carry out basic operation Division, Complements and Bas plication (Vertically Cross-wise ion s-II s by numbers near base, vers by use of digital roots, ts nbers near base ractions 	ethods. ns covering Addition,Su es,). od, Base method, Duplex	5 btraction, 6 4 6 method 5			

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S-14 Children

	6.3 Use of various Vedic Techniques for answering numerical aptitudequestions from Competitive Examinations
	Text Books (s)
1	Vedic Mathematics Sutra By Dr. A Kumar
2	Enjoy Vedic Mathematics-By Dr. Ramesh Kolluru
3	Learn and Tech Vedic Mathematics by DR. S. K. KAPOOR (Lotus Press)

a dia man	Reference Books (s)					
1	Vedic Maths Books for Beginners					
2	Vedic Mathematics Made Easy, 2nd Edition					
3	Vedic Mathematics: Sixteen Simple Mathematical Formulae From The Vedas					

	Related Online Content (MOOCS, SWAYAM, NPTEL, WEBSITES etc)	
1	https://navavani.org.in/wp/wp- content/uploads/2017/07/FUNDAMENTALANDVEDICMATHEMATICS.pdf	
2	https://www.hitbullseye.com/Vedic-Maths-Tricks.php	
3	https://www.cuemath.com/learn/vedic-maths-tricks/	

Sau Shine	Section Providence			CO-P	O MAPPIN	IG				
	PO 1	PO 2	PO 3	PO 4	PO 5	P0 6	PO 7	PO 8	PO 9	PO
	-						- I.		1	10
CO 1	S	S	S	L	S	L	S	М	S	S
CO 2	S	L	S	M	S	S	S	L	L	М
CO 3	S	L	S	S	S	М	S	L	S	L
CO 4	M	M	М	M	М	L	М	М	M	М
CO 5	S	S	L	S	М	S	L	S	M	M
S: Strong	M: Medi	um . L: Lo	w						-	

Resolution: All BOS members had unanimously approved the same.

Item No. Mar-2024/03/65 : To Discuss and Seek approval for the new program Master of Science (Computer Application) Program, Structure, Syllabus of Sem-I.

Discussion: Briefing the above item, *Mrs. Gouri Vaidya* explained the members that eligibility criteria, Program structure and Syllabus of the Semester-1 of the M.Sc. (Computer Application).

Proposed by : Mrs. Gouri Vaidya Seconded by : Dr. Janardan Pawar





Shree Chanakya Education Society's Indira College of Commerce and Science Pune



Program Code: PG 6 Master of Science (Computer Application) (Under Faculty of Science)

A.Y: 2024 - 25

'Dhruv', 89/2A, New Pune-Mumbai Highway, Tathwade, Pune - 411033 Tel: +91-20-66759400, +91-20-66759507/515/637, +91-20-66759502/504





Shree Chanakya Education Society's

INDIRA COLLEGE OF COMMERCE AND SCIENCE

"Empowering Minds to Elevate Lives"

Affiliated to Savitribai Phule Pune University, 'NAAC-A" Accredited & Autonomous Status by UGC, New Delhi.

Name of Program: Master of Science (Computer Applciation)

Introduction:

M.Sc. (Computer Application) is a Two Years Full Time Post Graduate Program. It is a career-focused program designed to equip you with latest technologies and various programming skills and become an expert in the Information technology field.

Program Structure:

- The Program is of a Two Year (Four Semesters) Full Time Post Graduate Program.
- The Program shall be based on credit system comprising 88 credits.

Eligibility Criteria:

- a. Bachelor Degree in Science/Technology/Engineering OR
- b. Bachelor of Computer Applications (B.C.A.) OR
- c. B.Sc.(Computer Science) OR
- d. Bachelor of Computer Science (B.C.S.) OR
- e. B.Sc.(Information Technology) OR
- f. B.Sc.(Data Science) OR
- g. B.Sc.(Cyber and Digital Science) OR
- h. B.Sc. (Cyber Security) OR
- i. B.Sc. (Cloud Computing) OR
- j. Bachelor of Engineering(BE/B.Tech) in Computer Engg/Computer Science & Engg./ Computer Science and Design/ Information Technology/Electronics and Telecommunication/AI and Data Science/AI and Machine Learning/ equivalent OR
- k. B. Voc. in Software Development/ Information Technology OR
- 1. B.Sc. with Computer Science as Principal Subject OR
- m. General B.Sc. with Computer Science as one of the subject at TYBSc level Programme

Medium of Instruction: English



MSc(Computer Application) Program Structure

	I	NDIRA COI	LLEGE OF COMMERCE & SCIENCE	E,PUNE				
		Master	s of Science (Computer Applicati	on)				
			Semester 1			er "		
Course Type	Course	Course Code	Course/Paper Title	Hours/ Week	Cr	CIA	ESE	Total
	Major Paper [Theory]	CA 501	Database Systems and SQL	4	04	30	70	100
мс	Major Paper [Theory]	CA 502	Python Programming and Data Structures	4	04	30	70	100
	Major Paper [Theory]	CA 503	Operating Systems	2	02	15	35	50
	Major Paper [Practical]	CA 504	Lab course Based on CA 501 & CA 503	4	02	15	35	50
	Major Paper [Practical]	CA 505	Lab course based on CA 502	4	02	15	35	50
unu (na distanti (na	Major Elective [Theory]	CA 510A	Java Programming	2	02	15	35	50
ME	Major Elective [Practical]	CA 511A	Lab Course based on CA 510A	4	02	15	35	50
			OR				in o po	
	Major Elective [Theory]	CA 512B	Cloud Computing	2	02	15	35	50
	Major Elective [Practical]	CA 513B	Lab Course based on CA 512B	4	02	15	35	50
RM	Research Methodol ogy	CA 531	Research Methodology	4	04	30	70	100
	de travésional i		Total		22	150	350	500



			Semester 2							
Course Type	Course	Course Code	Course/Paper Title	Hours/ Week	Cr	CIA	ESE	Total		
	Major Paper [Theory]	CA 551	Web Technologies	4	04	30	70	100		
	Major Paper [Theory]	CA 552	Introduction to Data Science	4	04	30	70	100		
мс	Major Paper [Theory]	CA 553	Computer Networks	2	02	15	35	50		
	Major Paper [Practical]	CA 554	Lab course based on CA 551	4	02	15	35	50		
	Major Paper [Practical]	CA 555	Lab course based on CA 552	4	02	15	35	50		
	Major Elective [Theory]	CA 560A	Advance Java Programming	2	02	15	35	50		
and the offer	Major Elective [Practical]	CA 561A	Lab Course on based on CA 560A	4	02	15	35	50		
MF	OR									
	Major Elective [Theory]	CA 562B	C# .NET	2	02	15	35	50		
	Major Elective [Practical]	CA 563B	Lab Course on based on CA 562B	4	02	15	35	50		
OJT/FP	Field Project	CA 581	Industry Internship/Field Project	4	04	30	70	100		
			Total		22	165	385	550		



			Semester 3	e de la composition d Composition de la composition de la comp				
Course Type	Course	Course Code	Course/Paper Title	Hours/ Week	Cr	CIA	ESE	Total
	Major Paper [Theory]	CA 601	Artificial Intelligence and Machine Learning	4	04	30	70	100
	Major Paper [Theory]	CA 602	Web Services	4	04	30	70	100
MC	Major Paper [Theory]	CA 603	Software Engineering	2	02	15	35	50
	Major Paper [Practical]	CA 604	Lab Course based on CA 601	4	02	15	35	50
	Major Paper [Practical]	CA 605	Lab Course based on CA 602	4	02	15	35	50
	Major Elective [Theory]	CA 610A	Mobile Application Development	2	02	15	35	50
	Major Elective [Practical]	CA 611A	Lab Course based on CA 610A	4	02	15	35	50
IVIL	OR						1	1 · · · ·
	Major Elective [Theory]	CA 612B	Software Testing	2	02	15	35	50
	Major Elective [Practical]	CA 613B	Lab Course based on CA 612B	4	02	15	35	50
RP	Research Project	CA 631	Research work	4	04	30	70	100
n in the bring			Total		22	165	385	550



			Semester 4					
Course Type	Course	Course Code	Course/Paper Title	Hours/ Week	Cr	CIA	ESE	Total
мс	Majar Paper	CA 651	Industrial Training		12	100	200	300
	Major Elective [Theory]	CA 660A	MIS	2	02	15	35	50
	OR							
ME	Major Elective [Theory]	CA 661A	E-Commerce and Digital Marketing	2	02	15	35	50
	Major Elective [Theory]	CA 662B	ERP	2	02	15	35	50
	OR							
	Major Elective [Theory]	CA 663B	Cyber Security	2	02	15	35	50
RP	Research Project	CA 681	Research Work	6	06	30	70	100
			Total		22	160	340	500



Leaching Scheme	No. of Credits 4	Examination Scheme
4 Hours / Week	The of circuits 4	IE : 30 Marks
		UE: 70 Marks
Course Objectives: -		
1. To be familiar wi	ith database management system	
2. To get acquainted	d with SQL and PL/SQL	
To understand ad	dvanced SQL features and procedural S	SQL
4. To know the cond	cept of triggers and assertions	
Course Outcomes: -		
On completion of this co	ourse, students will be able to:	
1. Enumerate datab	base applications	
Design E-R Mod	lel for given requirements and convert	the same into database tables.
Apply Normaliza	ation techniques for database design	
4. Formulate databa	ase queries using SQL	
5. Write Embedded	and dynamic queries using SQL/PLSC	QL
	Course Contents	
Chapter 1 Introdu	iction of DBMS	10 Hours
1.1 DBMS Overview		
1.2 Advantages of DBM	S	
1.3 Users of DBMS		
1.4 Applications of DBM	AS	
1.5 Data models - (Hiera	archical, Network, ER, Relational),	
1.6 File system Vs. DBM	AS .	
1.7 Data independence		3*
1.8 Levels of abstraction	1	
1.9 Architecture of DBM	1S	
1.10 DatabaseLanguages	s(DDL,DML,DCL)	
Chapter 2 Concept	tual Design (E-R model)	14 Hours
2.1 Entity Types, Entity	Sets,	
2.2 Attributes ,Attribute	Types	
2.3 Relationship Types, 1	Relationship Sets, Relationship Degree	e
1 LED Diagrama Nami	ng Conventions(Attribute, Entity, Relat	tionship), and Design
2.4 ER Diagrams, Nami		
2.4 ER Diagrams, Namin 2.5 Issues;		
2.4 ER Diagrams, Namin 2.5 Issues; 2.6 ER-to-Relational Ma	apping,	
2.4 ER Diagrams, Namina2.5 Issues;2.6 ER-to-Relational Ma2.7 Schema Diagrams	apping,	
 2.4 ER Diagrams, Namina 2.5 Issues; 2.6 ER-to-Relational Ma 2.7 Schema Diagrams 2.8 Characteristics of Sp 	apping, pecialization and Generalization	
 2.4 EK Diagrams, Naming 2.5 Issues; 2.6 ER-to-Relational Ma 2.7 Schema Diagrams 2.8 Characteristics of Sp 2.9 Keys, Constraints (Pi 	apping, pecialization and Generalization rimary key, Foreign key, Check. Uniqu	ue key, Not Null, Default etc)



functional dependency), Closure of set of Functional Dependency, Closure of set of attr	ibutes
3.3 Decomposition, Properties of Relational Decomposition (Attribute Preservation, Depen	ndency
Preservation, Lossless join, No redundancy Non Additive Join Property.)	
3.4 Normalization, Need of Normalization, Normal form (1 NF,2NF,3NF,BCNF),	
3.5 Case Studies	
Chapter 4 Introduction to SQL 0)8 Hours
4.1 Introduction to SQL	
4.2 Data Types in SQL	
4.3 DDL commands (create, alter.drop,rename,desc) with examples	
4.4 DML command(insert, delete, update, select)	
4.5 DCL command(commit,rollback,grant,revoke)	
4.6 Basic structure of SQL SELECT query(Using BETWEEN, IN, OR, Like, ORDER BY	Y, GROUP
BY and HAVING Clause, Distinct)	
4.7 Aggregate functions,	
4.8 Set operations	
Chapter 5 Intermediate SQL 1	10 Hours
5.1 Nested ,Sub-queries,(Using All,ANY),	
5.2 Joins and their type	
5.3 Grouping and summarizing information- A very common error with GROUP BY-	
5.4The HAVING clause	
5.5 Writing queries on more than one table/multiple table -JOIN- Avoiding	
5.6ambiguously named columns- Outer JOINs(LEFT OUTER JOIN, RIGHT	
5.70UTER JOIN, FULL OUTER JOIN)- Using table aliases- SELF JOINS	
5.8 Overview of indexes, views, sequences	
5.9 Optimizing Queries with Indexes and views	
Chapter 6 PL/SQL, Embedded and Dynamic SQL 1	0 hours
6.1 PL/PostgreSQL : Features, Advantages, Language structure, statements and Expression	ns
6.2 Control flow, conditional statements, loops	
6.3 Cursors(Cursor attribute, Types-Implicit, explicit, parameterized cursor, nesting of cur	rsor)
6.4 Stored procedure(creation, procedure call, implementation)	
6.5 Functions(creating ,calling function, passing parameters, returning a value)	
6.6 Handling errors and exceptions	
6.7 Triggers and Assertions	
Reference Books:	
1.Database System Concepts, Henry F. Korth, Abraham Silberschatz, S.Sudarshan, Tata N	AcGraw-
Hill Education 7 th edition	
2.Postgresql, Regina obe, Leo Hsu, OReilly publications, 3rdedition	
3. Database Systems, Shamkant B. Navathe, RamezElmasri, Pearson Higher Education	111 2 - 4
4. Database Management System, Kagnu Kamakrishnan and Johannes Genrke, McGraw-H	iiii sra
Reference Links:	
1 https://opensource.org/	
2. https://www.w3school.com/	
3. Wikipedia: https://en.wikipedia.org/	
4 Github: https://help.github.com/	



	Semester- I	and the second
Course Type: Major Paper	·-2	Course Code: CA 502
Course Tit	le : Python Programming and Da	ata Structures
Teaching Scheme	No. of Credits 4	Examination Scheme
4 Hours / Week		IE : 30 Marks
Course Objectives: -		UE. 70 Marks
1. To introduce program	nming concepts using python	
 Student should be al 	ble to develop Programming logic usin	ng python
 To develop basic cor 	ncepts and terminology of python pros	gramming
 To test and execute r 	python programs	58
5. To be familiar with t	the concept of Data Structure.	
6. To learn the systema	tic way of solving problem	
7. To understand the di	fferent methods of organizing large an	mount of data
8. To efficiently impler	ment the different data structures	
9. To efficiently impler	ment solutions for specific problems	
Course Outcomes: -	*	
On completion of this course	e, students will be able to:	
1. Develop logic for pro	oblem solving	
2. Determine the metho	ds to create and develop Python progr	ams by utilizing the data
3. structures like lists, o	dictionaries, tuples and sets.	
4. To be familiar about	the basic constructs of programming	such as data, operations,
5. conditions, loops, fur	nctions etc.	
6. To write python prog	grams and develop a small application	1 project
7. Design and impleme	ent Data structures and related algorith	ims
8. Understand several v	ways of solving the same problem.	
9. To use well-organize	ed data structures in solving various p	roblems.
10. To differentiate the u	usage of various structures in problem	solution.
11. Implementing algori	ithms to solve problems using appropr	iate data structures.
	Course Contents	
Chapter 1 Basics of Pyth	on Programming	08 Hours
1.1 Introduction to python		
1.2 Features of Python,		
1.3 Identifiers, Reserved Key	words, Variables, Comments, Indenta	ation in Python, Multiline
Statements		
1.4 Input, Output and Import	Functions	
1.5 Operators (Arithmetic, Co	omparison, Assignment, Bitwise, Log	ical, Membership, Identity),
operator precedence		
1.6 Data Types and Flow Cor	ntrol (Numbers, Strings, List, Tuple, S	Set, Dictionary, Data type
conversion, Decision Making	g (if, for, while, nested loops, control	statements, types of loops))
1.7 Python tuples and sets Op	perations on tuples - Concept, operation	ons and built-in functions.
Sets - Concept, operations an	nd built-in functions.	

1.8 Python Dictionary(Concept (mutable), Creating and accessing values in a dictionary, Updating



dictionary, d		
and methods		
Chapter 2	Python Lists and Python Arrays	06 Hours
2.1 Python L deleting 1 functions ,Using Li 2.2 Python A python array 2.3 Types of 2.4 Array Or	ists - concept, creating and accessing elements, updating & ists, basic list operations, reverse, Indexing, slicing, built-in List , Functional programming tools - filter(), map(), and reduce() ists as stacks and Queues, List comprehensions array - Concept of array- Array Representation, creating , accessing array elements. Arrays – One, Two and Multidimensional array.	
2.4 Array Of 2.5 array slic	ing python list vs array	
Chapter 3	Functions and Object oriented concepts	06 Hours
ools - filter(3.2 Python C), map(), and reduce() Classes / Objects Object oriented programming and classes in Python - c ects, accessing members ,Data hiding (the double underscore prefix),Bu	rogramming reating classes tilt-in class
attributes Re	ecursive calls to methods. Class variables, class methods, and static met	hods
Chapter 4 4.1 Concept , 4.2. Algorithm	ecursive calls to methods ,Class variables, class methods, and static met Introduction to Data Structure, Sorting and Searching , Need of Data Structure , Types of Data Structure m analysis : definition, characteristics , Space complexity, time complexity	hods 04 Hours
Chapter 4 4.1 Concept, 4.2. Algorith 4.3 Asympto 4.4 Sorting a 4.5 Searching	ecursive calls to methods ,Class variables, class methods, and static met Introduction to Data Structure, Sorting and Searching , Need of Data Structure , Types of Data Structure m analysis : definition, characteristics , Space complexity, time complex tic notation (Big O(Oh), Omega Ω) lgorithms with efficiency - Bubble sort, Insertion sort, Merge sort, Quic g techniques –Linear Search, Binary search	hods 04 Hours aty k Sort
Chapter 4 4.1 Concept , 4.2. Algorith 4.3 Asympto 4.4 Sorting a 4.5 Searching Chapter 5 Stack :	ecursive calls to methods ,Class variables, class methods, and static met Introduction to Data Structure, Sorting and Searching , Need of Data Structure , Types of Data Structure m analysis : definition, characteristics , Space complexity, time complex tic notation (Big O(Oh), Omega Ω) lgorithms with efficiency - Bubble sort, Insertion sort, Merge sort, Quic g techniques –Linear Search, Binary search Stacks and Queues	hods 04 Hours kity k Sort 12 Hours
Attributes , Ro Chapter 4 4.1 Concept , 4.2. Algorith 4.3 Asympto 4.4 Sorting a 4.5 Searching Chapter 5 Stack : 5.1 Introduct 5.2 Represen 5.3 Operation 5.4 Applicati 5.5 Simulatir Queue : 5.6 Introduct 5.7 Represen 5.8 Operation 5.9 Types of 5.10 Concept	ecursive calls to methods ,Class variables, class methods, and static met Introduction to Data Structure, Sorting and Searching , Need of Data Structure , Types of Data Structure m analysis : definition, characteristics , Space complexity, time complexitic tic notation (Big O(Oh), Omega Ω) lgorithms with efficiency - Bubble sort, Insertion sort, Merge sort, Quic g techniques –Linear Search, Binary search Stacks and Queues ion tation- Using Arrays ns – init(), push(), pop(), isEmpty(), isFull(). on - infix to postfix, infix to prefix, postfix evaluation, ng recursion using stack ion tation Using Arrays ns - init(), enqueue(), dequeue(), isEmpty(), isFull() Queue - Linear Queue, Circular Queue, Priority Queue, t of doubly ended queue	hods 04 Hours atty k Sort 12 Hours
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attributes ,Ro Chapter 4 4.1 Concept , 4.2. Algorithi 4.3 Asympto 4.4 Sorting a 4.5 Searching Chapter 5 Stack : 5.1 Introduct 5.2 Represen 5.3 Operation 5.4 Applicati 5.5 Simulatir Queue : 5.6 Introduct 5.7 Represen 5.8 Operation 5.9 Types of 5.10 Concept Chapter 6 6.1 Introduct 6.2 Implement 6.3 Types of 6.4 Operation merge 6.5 Represen	ecursive calls to methods ,Class variables, class methods, and static met Introduction to Data Structure, Sorting and Searching , Need of Data Structure , Types of Data Structure m analysis : definition, characteristics , Space complexity, time complexit tic notation (Big O(Oh), Omega Ω) lgorithms with efficiency - Bubble sort, Insertion sort, Merge sort, Quice g techniques –Linear Search, Binary search Stacks and Queues ion tation- Using Arrays ns – init(), push(), pop(), isEmpty(), isFull(). on - infix to postfix, infix to prefix, postfix evaluation, ng recursion using stack ion tation Using Arrays ns - init(), enqueue(), dequeue(), isEmpty(), isFull() Queue - Linear Queue, Circular Queue, Priority Queue, t of doubly ended queue Linked List ion to Linked List – Static & Dynamic representation, Linked List – Singly, Doubly, Circular ns on Linked List - create, display, insert, delete, reverse, search, sort, co ting stacks and queues using linked lists	04 Hours ity k Sort 12 Hours 09 hours



7.1 Concept & Terminologies 7.2 Types - Binary tree, binary search tree, expression tree 7.3 Representation - Static and Dynamic 7.4 Operations on BST - create, Insert, delete, search, traversals (preorder, inorder, postorder), counting leaf, non-leaf & total nodes, non recursive inorder traversal Graph 06 hours **Chapter 8** 8.1 Concept & terminologies 8.2 Graph Representation – Adjacency matrix, adjacency list, inverse Adjacency list, adjacency multi list. 8.3 Graph Traversals - Breadth First Search and Depth First Search **Reference Books:** 1. An Introduction to Computer Science using Python 3 by Jason Montojo, Jennifer Campbell, Paul Gries, The pragmatic bookshelf-2013 2. James Payne, "Beginning Python: Using Python and Python 3.1, Wrox Publication 3. Introduction to Computer Science Using Python- Charles Dierbach, Wiley Publication Learning with Python ", Green Tea Press, 2002 4. Introduction to Problem Solving with Python by E balguruswamy, TMH publication2016 5. Beginning Programming with Python for Dummies Paperback - 2015 by John Paul Mueller 5. Introducing Python- Modern Computing in Simple Packages - Bill Lubanovic, O., Reilly Publication 6. Beginning Python: From Novice to Professional, Magnus Lie Hetland, Apress 7. Data Structures - Horowitz, Sahani 8. Problem-Solving in Data Structures & Algorithms Using Python by Robert Karamagi 9. Algorithms & Data Structure in Python by Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser - Wiley Publication, student edition 10. Problem Solving in Data Structure & Algorithms using Python by Hemant Jain - Second Edition **Reference Links:** 1. www.w3schools.com 2. www.tutorialspoint.com 3. www.javatpoint.com 4. www.geeksforgeeks.com 5. www.programiz.com 6. www.theserverside.com 7. www.educba.com 8. www.sanfoundry.com 9. www.prepbytes.com



Course Ty	pe: Major Paper – . Co	Semester- 1 3 urse Title : - Operating Syste	Course Co ems	de: CA 503
Teach 2 Ho	ning Scheme ours / Week	No. of Credits 2	Examination IE : 15 M UE: 35 M	Scheme arks arks
Course Obj	ectives: -			
1. To Un	derstand the basic co	incepts of operating system.		
2. To stu	dy Architecture, File	systems and basic operating syst	em commands.	
3. To uno	derstand Processes. T	hreads and Deadlocks		
4. To ana	alvze memory manag	rement schemes.		
5 To uno	derstand I/O manager	ment and File systems.		
Course Out	comos:	inent and the systems.		
On complet	ion of this course, st	udents will be able to:		
1 Evel	in basic concents of	operating system		
1. Expla	ribe algorithms for a	operating system	ing	
2. Desci	ribe algorithms for pi	rocess, memory and disk scheduli	ing	
3. Appl	y technique for inter-	process communication and Mul	tithreading.	
4. Imple	ement concept of crit	ical-section		34 A
5. Com	pare and contrast dea	dlock avoidance and prevention.		
6. Use f	unctions for file syste	em management		
		Course Contents		
11	Testers Beating			
.1 Introduc Jsers. 1.2	tion to Operating S Introduce the conce	Systems, Different services pro ept of Process, Process States,	vided by Operating Process Control B	4 Hours System to lock, User
Japter 1 1.1 Introduct Jsers. 1.2 nterface, System Calls 1.3 Introduct ntroduction Chapter 2	s. tion to Linux Operation to File System and P	Systems, Different services pro ept of Process, Process States, ating System - Features of Lin Process Environment.	vided by Operating Process Control B ux, Architecture of	4 Hours System to lock, User the Linux, 06 Hours
Lapter 1 1.1 Introduct Users. 1.2 Interface, System Calls 1.3 Introduction Chapter 2 2.1 File Con	Introduction ation to Operating S Introduce the conce s. ation to Linux Oper- to File System and P File System cept, File Attribute.	Systems, Different services pro ept of Process, Process States, ating System - Features of Lin Process Environment. File Operations, File Types, File S	vided by Operating Process Control B ux, Architecture of Structure	4 Hours System to lock, User the Linux, 06 Hours
Lapter 1 L.1 Introduct Users. 1.2 Interface, System Calls L.3 Introduction Chapter 2 2.1 File Con 2.2 Access N 2.3 Director Acyclic grap 2.4 File Syst 2.5 Allocatio 2.6 Free Spa	Introduction etion to Operating S Introduce the concess. s. to File System and P File System cept, File Attribute, I Methods - Sequential ry overview, Single oh directory, General tem Structure and Impon Methods - Contigu cep Management – Bi	Systems, Different services pro ept of Process, Process States, ating System - Features of Lin Process Environment. File Operations, File Types, File S I Access Method, Direct Access I level directory, Two level direct graph directory plementation - Partitions and Mo uous allocation, Linked allocation it vector, Linked list, Grouping, C	vided by Operating Process Control B ux, Architecture of Structure Method, Other Acces ctory, Tree structure unting, Virtual File S n, Indexed allocation Counting, Space maps	4 Hours System to lock, User the Linux, 06 Hours is Methods directory, ystems
Chapter 11.1 IntroductUsers. 1.2Interface,System Calls.3 IntroductionChapter 22.1 File Con2.2 Access N2.3 DirectorAcyclic grap2.4 File Syst2.5 Allocatic2.6 Free SpaChapter 3	Introduction etion to Operating S Introduce the concerns. s. etion to Linux Operating S to File System and P File System cept, File Attribute, I Methods - Sequential ry overview, Single oh directory, General tem Structure and Impon Methods - Contiguide Management – Bit Process Schedulir	Systems, Different services pro ept of Process, Process States, ating System - Features of Lin Process Environment. File Operations, File Types, File S I Access Method, Direct Access I level directory, Two level direct graph directory plementation - Partitions and Mo uous allocation, Linked allocation it vector, Linked list, Grouping, C ng and Multithreading	vided by Operating Process Control B ux, Architecture of Structure Method, Other Access ctory, Tree structure unting, Virtual File S h, Indexed allocation Counting, Space maps	4 Hours System to lock, User the Linux, 06 Hours s Methods directory, ystems 06 Hours
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4.2 Deadlock Characterization - Necessary Conditions, Resource Allocation Graph

4.3 Deadlock Prevention

4.4 Deadlock Avoidance - Safe state, Resource-Allocation-Graph Algorithm, Banker's Algorithm

4.5 Deadlock Detection

4.6 Recovery from Deadlock - Process Termination, Resource Preemption

Chapter 5 Memory Management

08 Hours

5.1 Introduction – Requirement of Memory management, Logical and Physical Address Space, Static and dynamic Loading, Static and Dynamic Linking

5.2 Memory Management Techniques- Contiguous memory management schemes, On-

Contiguous memory management schemes

5.3 Swapping- Definition, Benefits of swapping

- 5.4 Memory allocation- Low Memory, High Memory
- 5.5 Partition Allocation- Best Fit, First Fit, Worst Fit, Next Fit
- 5.6 Paging- Use of Paging,
- 5.7 Fragmentation- External & Internal Fragmentation
- 5.8 Segmentation-Virtual Memory Segmentation, Simple Segmentation

5.9 Dynamic Loading, Dynamic Linking

Reference Books:

1. Operating Systems Achyut S. Godbole Tata McGraw Hill 2nd edition.

- 2. Operating Systems D.M. Dhamdhere Tata McGraw Hill 2nd edition.
- 3. Understanding Operating System: Flynn & Mctloes 4th edition, thomson.
- 4. Operating Systems Design & implementation Andrew S. Tanenbam, Albert S. Woodhull Pearson.
- 5. Operating System Concepts (7th Ed) by silberschatz and Galvin, Wiley, 2000.
- 6. Operating Systems (5th Ed) Internals and Design Principles by William Stallings, Prentice Hall, 2000.
- Operating System Concepts (2nd Ed) by James L. Peterson, Abraham Silberschatz, Addison Wesley.
- Computer Organisation and Architecture (4th Ed) by William Stallings, Prentice Hall India, 1996.
- 9. Modern Operating Systems by Andrew S Tanenbaum, Prentice hall Inida, 1992.

10.UNIX - Sumitabha Das 11.Unix Shell Programming - Yashwant Kanetkar, BPB publications.

Reference Links:

- 1. https://onlinecourses.nptel.ac.in/noc21_cs88/preview
- 2. https://cscie92.dce.harvard.edu/fall2022/slides/Memory%20Management.pdf



Course Ty	pe: Maior Paper –4	Semester- I	Course Code: CA 504
	Course Title : -	Lab course Based on CA	501 & CA 503
Teac 4 H	hing Scheme ours / Week	No. of Credits 2	Examination Scheme IE : 15 Marks UE: 35 Marks
Course Ob	jectives:		
1. 2. 3.	To understand basic dat To design E-R Model f tables. To get acquainted with	tabase management operations for given requirements and cor SQL and PL/SQL commands	s. nvert the same into database
Course Ou	tcomes:		
On complet	tion of the course, studer	nt will be able to-	
1. 2.	Create database tables i Write and execute simp	in postgreSQL. ple, nested queries.	
		Course Contents	in the second
The lab inst	tructor shall frame suitab	ble assignments to cover the fo	ollowing (but not limited to)
Assignmen constraint & Assignmen Check cons Assignmen created in p Assignmen table [wher [where <co< td=""><th>at 1: To create simple tab & as a field level constra at 2:To create more than straint, Unique constraint at 3: To drop a table, alter previous Assignments. (at 4: To query the tables re <condition> order by - molition> group by <> has</condition></th><th>bles with only the primary key int) (include all data types), one table, with referential inte t, Not null constraint er schema of a table, insert / up use simple forms of insert / up using simple form of select st <field list="">] Select <field-list, aving <> order by <>]</field-list, </field></th><th>constraint (as a table level egrity constraint, PK constrain, pdate / delete records using tables pdate / delete statements) tatement Select <field-list> from aggregate functions > from table</field-list></th></co<>	at 1: To create simple tab & as a field level constra at 2:To create more than straint, Unique constraint at 3: To drop a table, alter previous Assignments. (at 4: To query the tables re <condition> order by - molition> group by <> has</condition>	bles with only the primary key int) (include all data types), one table, with referential inte t, Not null constraint er schema of a table, insert / up use simple forms of insert / up using simple form of select st <field list="">] Select <field-list, aving <> order by <>]</field-list, </field>	constraint (as a table level egrity constraint, PK constrain, pdate / delete records using tables pdate / delete statements) tatement Select <field-list> from aggregate functions > from table</field-list>
Assignmen	it 5: To query table, using	g set operations (union, inters	ect)
Assignmen	it o: 10 write cursor and	tuling algorithms like FCFS	RR SIF
rassignmen	it 7. To implement sched	auting argorithms like rero, i	NN, 001



Course Type: Major Paper –	Semester- I 4 Title - Laboratoria	Course Code: CA 505
Teaching Scheme 4 Hours / Week	No. of Credits 2	Examination Scheme IE : 15 Marks UE: 35 Marks
	Python Assignment List	
ASSIGNMENT NO.1:-BASIC	PYTHON	
1) Write a Python Program to Ca	alculate the Average of Number	s in a Given List. 2)
2) Write a program which accep	ts 6 integer values and prints "E	DUPLICATES" if any of the
values entered are duplicates of	nerwise it prints "ALL UNIQUE	E". Example: Let 5 integers
are (32, 10, 45, 90, 45, 6) then o	utput "DUPLICATES" to be pr	inted.
3) 3) Write a program to display	following pattern.	
1		
23		
456		
78910		
ASSIGNMENT NO 2:- PYTH	ION TUPLES	
1. Reverse the following tuple a	Tup = (10, 20, 30, 40, 50)	
2. Write a Python program to cr	eate a list of tuples with the first	t element as the number and
second element as the square of	the number.	
3.Copy element 44 and 55 from	the following tuple into a new	tuple tuple1 = (11, 22, 33, 44,
55, 66)		
4. Write a Python program to ge	t the 5th element from front and	15th element from last of a tuple.
5. Write a Python program to fir	id the repeated items of a tuple.	
6. Write a Python program to ch	teck whether an element exists v	within a tuple.
ASSIGNMENT NO 3:- PYTH	ION SETS	
1. What is the output of followin	g program:	
$sets = \{1, 2, 3, 4, 4\}$		
print(sets)		
2. Write a Python program to do	iteration over sets.	
3. Write a Python program to ad	and remove operation on set.	
4. Write a Python program to fit	a maximum and the minimum	value in a set.
ASSIGNMENT NO.4:- PYTH	ION DICTIONARY	aluas far sommer lesse
1. Write a Python program to co	ombine two dictionary adding va	alues for common keys.
Sample Dictionary: d1 = (a , 100, b , 200, a , 200)		
$d_{2} = \{a, 100, 0, 200, 0, 500\}$		
uz={ a .500, 0 .200, a .400}	0 15:400 14:400 14:2001)	
2 Write a Python script to gene	rate and print a dictionary that	contains a number (Between
2. write a rython script to gene	a are and print a dictionary that t	contains a number (Between
Sample Dictionary $(n = 5)$		
Expected Output · {1 · 1 · 2 · 4 · 3	· 9 4· 16 5· 253	
Expected Output . {1. 1, 2. 4, 5	· · · · · · · · · · · · · · · · · · ·	



3. Write a Python program to create a dictionary from a string.

Sample-String: 'W3resource'

Expected output: {'3': 1, 's': 1, 'r': 2, 'u': 1, 'w': 1, 'c': 1, 'e': 2, 'o': 1}

ASSIGNMENT NO.5:-PYTHON ARRAY

1. Write a python program to create an array of 5 integers and display the array elements. Access individual elements through indexes

2. Write a python program to get the number of occurrences of specified elements in an array

3. Write a python program to reverse the order of the items in the array

ASSIGNMENT NO.6:-PYTHON FUNCTIONS

1. Write a python function to sum of all the elements in a list

2. Write a python function to calculate the factorial of a number the function accept the number as an argument.

3. Write a python function to check whether a number falls within a given range.

4. Write a python function that takes a list and returns a new list with distict elements from the first list

Sample list: [1, 2, 2, 3, 3, 3, 3, 4, 5]

Unique list:[1, 2, 3, 4, 5]

DATA STRUCTURES Assignment List

The lab instructor shall frame suitable assignments

Assignment 1: Searching Algorithms - Implementation of searching algorithms to search an element using: Linear Search, Binary Search

Assignment 2: Sorting Algorithms - Implementation of sorting algorithms: Bubble Sort, Insertion Sort, Quick Sort, Merge Sort

Assignment 3: Singly Linked List -1. Dynamic implementation of Singly Linked List to perform following operations: Create, Insert, Delete, Display, Search, Reverse 2. Create a list in the sorted order.

Assignment 4: Doubly Linked List - Dynamic implementation of Doubly circular Linked List to perform following operations: Create, Insert, Delete, Display, Search

Assignment 5: Linked List Applications - Merge two sorted lists.

Assignment 6: Stack - Static and Dynamic implementation of Stack to perform following operations: Init, Push, Pop, Isempty, Isfull

Assignment 7: Applications of Stack - 1. Implementation of an algorithm that reverses string of characters using stack and checks whether a string is a palindrome. 2. Infix to Postfix conversion. Evaluation of postfix expression.

Assignment 8: Linear Queue - Static and Dynamic implementation of linear Queue to perform following operations: Init, enqueue, dequeue, IsEmpty, IsFull.

Assignment 9: Circular and Priority Queue 1. Implementation of circular queue 2. Implementation of priority queue

Assignment 10: Tree Travarsals, operations etc

Assignment 11 : Calculate indegree and out degree of a given graph



Teaching Scheme 2 Hours / Week	No. of Credits 2	Examination Scheme IE : 15 Marks UE: 35 Marks
Course Objectives: - 1. To learn implementat 2. To understand collect 3. To know the process	tion of object-oriented concepts with tion classes and interfaces. of application development using G	h Java. Graphical User Interface (GUI)
Course Outcomes: -		· · · · · · · · · · · · · · · · · · ·
On completion of this course,	, students will be able to:	
1. Identify classes, obje	cts, class members and relationships	s for a given problem.
2. Design end to end ap	plications using object-oriented con	structs.
Apply collection clas	ses for storing java objects.	
4. Use Java APIs for pro	ogram development.	
5. Handle abnormal terr	mination of a program using excepti	on handling
	Course Contents	
Chapter 1 Introduction	of Java	03 Hours
1.1 A Short History of Java		
1.2 Features of Java		
1.3 Java Environment - Comp	piler, Interpreter, JVM	
1.4 Structure of java program		
1.5 Data types, Variables, Op	erators, Keywords, Naming Conven	tion
1.6 Decision Making (if, swite	ch), Looping (for, while)	
1.7 Type Casting		• •
1.8 Array, Types of Arrays - 0	One Dimensional arrays - Two-Dim	ensional array
1.9 Accepting input using Col	mmand line arguments	
Chapter 2 Classes and C	hisole (Using BulleredReader and So	04 Hours
Chapter 2 Classes and C	Jobiects	04 Hours
2.1 Introduction to classes and 2.2 Defining Your Our Class	lobjects	
2.2 Denning Four Own Class	protected private default)	
2.5 Acress Specifics (public,	protected, private, default)	
2.5 Constructor types of cons	structor (default and parameterized)	Overloading Constructors
and use of 'this' Keyword	(usually and parameterized)	, o renouting constructors
2.6 static block, static fields a	nd methods	
are chine crowing onnie rieldo d		hashes de() and Class())
2.7 Predefined class - Object	class methods (equals (), toString().	hashcode(), getClass())
2.7 Predefined class – Object 2.8 Garbage Collection (finali	<pre>class methods (equals (), toString(), ize() Method)</pre>	nashcode(), getClass())



Inharitanca	
2.1 Inheritance Design (ortands Kauword) and Types of Inheritance	
3.1 Innerhance Basics (extends Keyword) and Types of Innerhance	
3.2 Superclass, Subclass and use of super Keyword	
3.3 Method Overriding and runtime polymorphism	
3.4 Use of final keyword related to variable, method and class	
Interface	
3.5 Use of abstract class and abstract methods Interface	
3.6 Defining and Implementing Interfaces	
Package	
3.7 Runtime polymorphism using interface Packages	
3.8 Creating, Accessing and using Packages	
Chapter 4 Collection, Exception Handling and I/O	08 Hours
Collections	
4.1 Wrapper Classes	
4.2 Introduction to the Collection framework	
4.3 List – ArrayList, LinkedList and Vector	
4.4 Set - HashSet, TreeSet, and LinkedHashSet	
4.5 Map – HashTable ,HashMap, LinkedHashMap, TreeMap	
4.6 Interfaces such as Iterators, ListIterators, Enumerations	
Exception Handling	
4.7 Exception class, Checked and Unchecked exception	s multiple
4.6 Catching exception and exception handling – if y, catch, many, thow and thow catch block	s, muniple
4.9 Creating user defined exception	
I/O	
4.10 String class(basic methods), String Buffer class	
4.11 File class	
4.12 DataInputStream and DataOutputStream class	
Chapter 5 Swing	07 Hours
5.1 What is Swing?	
5.2 The MVC Architecture and Swing	
5.3 Layout Manager and Layouts, The JComponent class	
5.4 Components – JLabel, JButton, JText, JTextArea, JCheckBox, JRadioButton, JL	list,
JComboBox, JMenu and JPopupMenu Class, JMenuItem	
5.5 Dialogs (Message, confirmation, input), JFileChooser	
5.6 Event Handling: Event sources, Listeners – ActionListener, itemListener	
S.7 Mouse and Reyboard Event Handling, Adapters – MouseAdapter, ReyAdapter	
1) Care Java Valume L. Fundamentale By Cay S. Horstmann, 11th Edition, Prentice	e Hall
ISBN 978-0-13-516630-7	e man,
2) The Complete Reference By Herbert Shildt, 11th Edition, McGraw Hill Education	n, ISBN
978-260-44023-2	
3) Java Beginners Guide By Herbert Shildt, 8 th Edition, McGraw-Hill Education 13 260-44021-8	SBN 978-1-
4) Core Java Volume II – Fundamentals By Cay S. Horstmann, 11th Edition, Prenti ISBN 978-013-516631-4	ce Hall,
5) Java 2 Programming Black Book By Steven Holzner, DreamTech Press, ISBN 9 953-4	78-93- 5119-



Reference Links:

1) The Complete Reference By Herbert Shildt https://gfgc.kar.nic.in/sirmv-science/GenericDocHandler/138-a2973dc6-c024-4d81-be6d-5c3344f232ce.pdf 2) Java 2 Programming Black Book By Steven Holzner

https://idoc.pub/documents/java-2-black-book-steven-holzner-vyly2rmq9v4m


		Semester-I		
Course Type: Major Elective [Practical]			Course Code: CA 511A	
	Course	Fitle : Lab Course based on	CA 510A	
Teaching Scheme No. of Credits 2			Examination Scheme	
4 Hours / Week			IE : 15 Marks	
			UE: 35 Marks	
Assignment 1	Assignment 1 Introduction of Java			
1. Write a Java number. Accep 2. Write a Java	program to accept t number using Bu Program to Rever	a number from user and generat iffered Reader class.	e multiplication table of a	

3. Write a Java program to print the sum of elements of the array. Also display array elements in ascending order.

4. Write a Java program to print the factors of a given number. (Use Scanner class).

5. Write a Java program to accept a number from user and print all prime numbers up to that number (Use Buffered Reader class).

6. Write a Java Program to Display Armstrong Numbers Between range. Accept range from user.

7. Write java program to check whether number is Perfect or not.

8. Write Java program to find multiplication of two matrix. Accept matrix from user.

Assignment 2 Classes and Objects

1. Define a class MyNumber having one private integer data member. Write a default constructor initialize it to 0 and another constructor to initialize it to a value. Write methods isNegative, isPositive, isOdd, iseven. Use command line argument to pass a value to the object and perform the above operations.

2. Write a program to create class Account (accno, accname, balance). Create an array of 'n' Account objects. Define static method "sortAccount" which sorts the array on the basis of balance. Display account details in sorted order.

3. Write a program which define class Product with data member as id, name and price. Store the information of 5 products and display the name of product having minimum price (Use array of object).

4. Write a program which define class Employee with data member as id, name and salary Store the information of 'n' employees and display the name of employee having maximum salary (Use array of object).

5. Define a class student having rollno, name and percentage. Define Default and parameterized constructor. Accept the 5 student details and display it. (Use this keyword).

6. Write a program create class as MyDate with dd,mm,yy as data members. Write parameterized constructor. Display the date in dd-mm-yy format. (Use this keyword).

7. Define a class Student with attributes rollno and name. Define default and parameterized constructor. Keep the count of Objects created. Create objects using parameterized constructor and display the object count after each object is created.

Assignment 3 Inheritance, Interface and Package

Inheritance

1. Define a "Point" class having members -x,y(coordinates). Define default constructor and parameterized constructors. Define two subclasses "ColorPoint" with member as color and subclass "Point3D" with member as z (coordinate). Write display method to display the details of different types of Points

2. Define a class Employee having members – id, name, salary. Define default constructor. Create a subclass called Manager with private member bonus. Define methods accept and display in both the classes. Create "n" objects of the Manager class and display the details of the worker having the maximum total salary (salary + bonus).

3. Write a Java program to create a super class Employee (members - name, salary). Derive a sub-



class as Developer (member – projectname). Derive a sub-class Programmer (member – proglanguage) from Developer. Create object of Programmer and display the details of it. Implement this multilevel inheritance with appropriate constructor and methods.

4. Write a Java program to create a super class Vehicle having members Company and Price. Derive two different classes LightMotorVehicle (mileage) and HeavyMotorVehicle (capacity_in_tons). Accept the information for "n" vehicles and display the information in appropriate form. While taking data, ask user about the type of vehicle first

5. Define an abstract class Staff with members name and address. Define two sub-classes of this class – FullTimeStaff (members - department, salary, hra - 8% of salary, da – 5% of salary) and PartTimeStaff (members - number-of-hours, rate-per-hour). Define appropriate constructors. Write abstract method as calculateSalary() in Staff class. Implement this method in subclasses. Create n objects which could be of either FullTimeStaff or PartTimeStaff class by asking the user 's choice. Display details of all FullTimeStaff objects and all PartTimeStaff objects along with their salary. 6. Create an abstract class Shape with methods area & volume. Derive a class Cylinder (radius, height). Calculate area and volume.

Interface

1. Define an interface "Operation" which has methods area (), volume (). Define a constant PI having a value 3.142. Create a class circle (member – radius), cylinder (members – radius, height) which implements this interface. Calculate and display the area and volume.

2. Define an Interface Shape with abstract method area (). Write a java program to calculate an area of Circle and Sphere. (Use final keyword).

Packages

1. Create a package named "Series" having three different classes to print series: a. Fibonacci series b. Cube of numbers c. Square of numbers Write a java program to generate "n" terms of the above series. Accept n from user.

2. Create a package "utility". Define a class Capital String under "utility" package which will contain a method to return String with first letter capital. Create a Person class (members – name, city) outside the package. Display the person's name with first letter as capital by making use of Capital String.

3. Write a package game which will have 2 classes Indoor & Outdoor. Use a function display () to generate the list of players for the specific game. Use default & parameterized constructor

Assignment 4 | Collection, Exception Handling and I/O

Collections

1. Construct a linked List containing names of colours: red, blue, yellow and orange. Then extend the program to do the following: i. Display the contents of the List using an Iterator ii. Display the contents of the List in reverse order using a ListIterator iii. Create another list containing pink and green. Insert the elements of this list between blue and yellow

2. Write a program to accept 'n' integers from the user & store them in an Array List collection. Display the elements of Array List.

3. Accept 'n' integers from the user and store them in a collection. Display them in the sorted order. The collection should not accept duplicate elements. (Use a suitable collection). Search for a particular element using predefined search method in the Collection framework.

4. Create a Hash table containing Employee name and Salary. Display the details of the hash table.

5. Create a java application to store city names and their STD codes using an appropriate collection. i. Add a new city and its code (No duplicates) ii. Remove a city from the collection iii. Search for a cityname and display the code

Exception Handling



1. Write a java program to accept a number from the user, if number is zero then throw user defined exception —Number is 0, otherwise check whether no is prime or not.

 Write a java program to accept Doctor Name from the user and check whether it is valid or not. (It should not contain digits and special symbol) If it is not valid then throw user defined Exception
 Name is Invalid -- otherwise display it

3. Define a class MyDate (day, month, year) with methods to accept and display a MyDate object. Accept date as dd, mm, yyyy. Throw user defined exception "InvalidDateException" if the date is invalid. Examples of invalid dates : 12 15 2015, 31 6 1990, 29 2 2001.

4. Write a class Driver with attributeslicense_no, name, address and age. Initialize values through the parameterized constructor. If age of Driver is less than 18 then user-defined exception should be generated —Age is below 18 years –

5. Write a class Student with attributes roll no, name, age and course. Initialize values through parameterized constructor. If age of student is not in between 15 and 21 then generate user-defined exception —Age Not Within The Range. If name contains numbers or special symbols raise exception —Name not valid

I/O

1. Write a java program that displays the number of characters, lines and words of a file.

2. Write a java program to accept details of n customers (c_id, cname, address, mobile_no) from user and store it in a file (Use DataOutputStream class). Display the details of customers by reading it from file. (Use DataInputStream class).

3. Write a program to read the contents of "abc.txt" file. Display the contents of file in uppercase as output.



2. Write a java program to design a following GUI. Use appropriate Layout and Components.



3. Write a java program to implement a simple arithmetic calculator. Perform appropriate



validations

4. Write a Program to design following GUI by using swing component JComboBox. On click of show button display the selected language on JLabel.



5. Write a program to design following GUI using JTextArea. Write a code to display number of words and characters of text in JLabel. Use JScrollPane to get scrollbars for JTextArea.

Words: 11 Characters: 55			
Swing is used to design GUI.			
		Sale Sale	
I show and the second second	1		
Count Monte			



Course T	ype: Major Elective	Semester-1 [Theory]	Course Code: CA 512B
Teac 2 Ho	Examination Scheme IE : 15 Marks UE: 35 Marks		
Course Obj 1. To un 2. To ap 3. Abilit 4. Under	ectives: derstand the principl preciate the role of V y to design and deplerstand Advanced Tec	es and paradigm of Cloud Compu /irtualization Technologies oy Cloud Infrastructure	ting and solutions
Course Out 1. On 2. Unc 3. Anz 4. Dev 5. Use	tcomes: completion of the co derstand the different alyze virtualization to relop and deploy app advance techniques	urse, student will be able to- Cloud Computing environment echnology and install virtualizatio lications on Cloud and apply security in Cloud Com	n software puting
		Course Contents	
Chapter 1	Introduction to C	Cloud Computing	08 Hours
Provide 1.3 Cloud-I Techno 1.4 Cloud I	rs, Multitenant Tech Enabling Technology logy, Virtualization ' Deployment Models.	nology. 7: Broadband Networks and Intern Technology.	et Architecture, Data Center
Chapter 2	Virtualization		06 Hours
2.1 Introdu 2.2 Unders 2.3 Virtua	action to Virtualization standing Hyper visor Machine Migration	on Technologies, Load Balancing s, Virtual Machines Provisioning Services, Provisioning in the Clo	and Virtualization, and Manageability ud Context
Chapter 3	Programming, E	nvironments and Applications	08 Hours
 3.1 Featur 3.2 Progra Enviro 3.3 Applic Chapter 4 	es of Cloud and Grid mming on Amazon A onments, eations: Moving appl ations, Amazon Clo Advanced Techn	Platforms, Programming Support AWS and Microsoft Azure, Emergi ication to cloud, Microsoft Cloud ud Services, Cloud Applications. inques and Security in The Cloud	d of Google App Engine, ging Cloud Software Services, Google Cloud
 4.1 Future Kuber 4.2 Securi Securi Design Manag Reference 1. Brian J.S and Strategi 	Trends in cloud Cornetes, Introduction to ty Overview – Cloud ty Governance – Ris a – Data Security – A gement and Access C Books: . Chee and Curtis Fr	nputing, Mobile Cloud, Comet Cl o DevOps. I Security Challenges and Risks – k Management – Security Monito Application Security – Virtual Mac Control, Disaster Recovery in Clou anklin, "Cloud Computing: Techr	oud. Containers, Docker, and Software-as-a-Service Security- ring – Security Architecture chine Security - Identity ids.



3. Dr. Kris Jamsa, "Cloud Computing: SaaS, PaaS, IaaS, Virtualization and more", Wiley Publications, ISBN: 978-0-470-97389-9

Reference Links:

1. https://sjceodisha.in/wp-content/uploads/2019/09/CLOUD-COMPUTING-Principles-and-Paradigms.pdf

2. https://arpitapatel.files.wordpress.com/2014/10/cloud-computing-bible1.pdf 3. Cloud Computinghttps://onlinecourses.nptel.ac.in/noc21_cs14/preview?



Course Type: Major Elective Course T	Semester- I [Practical] `itle : - Lab Course based or	Course Code: CA 513B n CA 512B
Teaching Scheme 4 Hours / Week	No. of Credits 2	Examination Scheme IE : 15 Marks UE: 35 Marks
Course Objectives: 1. To understand the principles 2. To appreciate the role of Vin 3. Ability to design and deploy	and paradigm of Cloud Computualization Technologies Cloud Infrastructure	ting
4. Understand Advanced Tech	niques and cloud security issues	and solutions
 On completion of the cours Understand the different Cl Analyze virtualization techn Develop and deploy applica Use advance techniques and 	e, student will be able to- oud Computing environment alongy and install virtualization ations on Cloud d apply security in Cloud Comp	software
	Assignments	
 Working and Implementation Working and Implementation Working and Implementation Working and Implementation Practical Implementation of S Installation and Configuration Working of Google drive to r Write a program for web feed Implementation of Virtualization Benefits of Virtualization in Clo Execute the step to Demonstr Installation and configuration Installation and configuration Installation and configuration Installation and configuration Installing and Developing A Case study on Amazon EC2 Design an Assignment based 	of Infrastructure as a service. of Software as a service. of Platform as a services. Storage as a Service of Virtualization Using KVM nake spreadsheet and notes. I. tion in cloud computing to lear oud using Open Source Operati ate and implementation of clou on of cloud Hadoop and demon .pplication Using Google App /Microsoft Azure/Google Cloud d on working with Manjrasoft A	n Virtualization Basics, ing System. id on single sign on. strate simple query Engine id Platform Aneka Software.



Course Typ	oe: Research Meth Cou	Semester- I odology Irse Title : Research Methodo	Course Code: CA 531 logy	
Teach 4 Hou	Teaching Scheme No. of Credits 4 Examination Schem 4 Hours / Week IE : 30 Marks UE: 70 Marks			
Course Obje 1. To inves 2. To test I 3. To ident 4. To disco 5. To study	ectives: stigate some existing hypothesis or theory tify patterns or trend over the truth and fa	g situation or problems, explore an ds related to the problem. ct. ntitative and qualitative data coller	nd analyze it.	
 On com Underst Formula Organiz Develop Write a 	pletion of the course and and comprehen ate research aims an e and conduct resea o and practice the sk research report and	e, student will be able to- d the basics in research methodolo d objectives arch (advanced project) in a more a ills necessary to conduct, review, a thesis.	gy. appropriate manner. and publish research.	
Chapter 1	Introduction to B	Course Contents	02 Hours	
 1.1 Definitio 1.2 Characte 1.3 Objective 1.4 Nature of 1.5 Important 1.6 Relevance 1.7 Restricted 1.8 Research 1.9 Difference 	n of Research ristics of Research es of Research f Research ce of Research ons in Research Process ce between Research	h Method and Research Process		
Chapter 2	Scientific Method	1	08 Hours	
 2.1 Introduct 2.2 Method t 2.3 Scientific 2.4 Steps in 2 2.5 Distinction 2.6 Difficult 2.7 Inductive 	ion to Eliminate Uncerta to Method Scientific Method on between Scientifies encountered in S	ainty ic Method & Non-Scientific Metho scientific Method Research	od	
Chapter 3	Types and Metho	ods of Research	10 Hours	



3.1	Introduction				
3.2	Pure and Applied Research				
3.3	Exploratory or Formulative Research				
3.4	Descriptive Research				
3.5	Diagnostic Research				
3.6	Evaluation Studies				
3.7	Action Research				
3.8	Experimental Research				
3.9	Analytical Study or Statistical Method				
3.10	Historical Research				
3.11	Surveys				
3.12	Case Study				
3.13	Field Studies				
3.14	Research ethics				
3.15	Plagiarism Tools				
Chapt	er 4 Literature Survey and Formulation	10 Hours			
4.1	Purpose of Literature Review				
4.2	Literature Resources				
4.3	Internet and literature review				
4.4	The Research Problem				
4.5	The Importance of Formulating a Research Problem				
4.6	Steps in Formulation of Research Problem				
4.7	Formulation of Objectives				
4.8	Establishing Operational Definitions				
Chapt	er 5 Hypothesis and Sampling	10 Hours			
5.1	What is Hypothesis?	n.'			
5.2	Nature & Characteristics of Hypothesis				
5.3	Significance of Hypothesis				
5.4	Types of Hypothesis				
5.5	Sources of Hypothesis				
5.6	Characteristics of Good Hypothesis				
5.7	What is Sampling?				
5.8	Aims of Sampling				
5.9	Characteristics of Good Sample				
5.10	Basis of Sampling				
5.11	Advantages of Sampling				
5.12	Limitations of Sampling				
5.13	Sampling Techniques or Methods				
5.14	Probability Sampling Methods				
5.15	Non-Probability Sampling Methods				
5.16	Sample Design and Choice of Sampling Technique				
Chapt	er 6 Data Collection Techniques	06 Hours			
61	Introduction				
62	Distinction between Primary Data and Secondary Data				
63	Data Collection Procedure for Primary Data				
64	Methods of Data Collection —Observation Ouestionnaire Interview	Focus group			
0.1	discussion	, i oouo Broup			
Chapt	er 7 Quantitative and Qualitative Data Analysis	10 Hours			
- mp	a second s	a v a a v da v			



- 7.1 What is Quantitative Data?
- 7.2 Types of Quantitative Data
- 7.3 Data Coding
- 7.4 Visual Aids for Quantitative Data Analysis-Tables, Bar Charts, Scatter graph, Line Graph etc.
- 7.5 Use of Statistics for Quantitative Data Analysis
- 7.6 Measures of Central Tendency-Mean, Median, Mode
- 7.7 Measures of Distribution-Range, Fractiles, Standard Deviation
- 7.8 Finding Relationships in the data-Chi-Square, t-test, ANNOVA(f-test),Z-test
- 7.9 What is Qualitative Data Analysis?
- 7.10 Analyzing textual and non-textual qualitative data
- 7.11 Grounded Theory
- 7.12 Computer-aided qualitative Analysis
- 7.13 Quantitative and Qualitative Data Analysis Tools

Presentation of the Research

03 Hours

- 8.1 Writing up the research
- 8.2 Paper presentation in Conference/Journal/Symposium etc
- 8.3 Poster presentation in exhibition
- 8.4 Software demonstration
- 8.5 Case Study -Preparation of Sample Research Paper

Reference Books:

Chapter 8

1. Researching Information Systems and Computing by Briony J Oates, SAGE SOUTH ASIA EDITION

2. The Research Methods Knowledge Base, by William M. K. Trochim, James P. Donnelly

3. Introducing Research Methodology: A Beginner's Guide to Doing a Research Project, by Uwe Flick

Resolution: All BOS members had unanimously approved the same.

Item No. Mar-2024/03/66 : Any other point with the permission of chairperson (Confidential and others)

Proposed by : Mrs. Gouri Vaidya Seconded by : Dr. Janardan Pawar

Resolution: All the points mentioned in Agenda for 11th BOS are disused and no other points to discuss.

Item No. Mar-2024/03/67 : Comments and Announcements (If any)

Proposed by : Mrs.Gouri Vaidya Seconded by : Dr.Janardan Pawarr

Resolution: Chairperson summarized the points discussed in the 11th BOS meeting



Proposing Vote of thanks

After discussion of the core agenda, *Mr. Vishal Verma* proposed vote of thanks to all members as there were no items left for discussion. He thanked the members for attending the meeting and giving good insights for the functioning of the Institute under Autonomy.

~

Adjournment of the Meeting

As there were no more item for discussion, the honorable Chairman Dr. Janardan Pawar declared the adjournment of the meeting.

PRINCIPAL Indira College of Commerce & Science Tathwade, Pune - 411 033.



SHREE CHANAKYA EDUCATION SOCIETY'S INDIRA COLLEGE OF COMMERCE AND SCIENCE

(Autonomous Status by UGC, New Delhi) Affiliated to Savitribai Phule Pune University & 'NAAC-A' Accredited ID : (PU/PN/SC/COM/166/2001) AISHE No - C-41313



NOTICE

16/02/2024

This is to inform all Honorable Members of Board of Studies that, the 10th meeting of Board of Studies- Commerce and Management, is conveyed on 24th February, 2024, Saturday at 3.00 pm in Pharmacy Conference Hall, Indira College of Pharmacy, Tathwade, Pune You are requested to confirm your mode of presence for the meeting (in person or over online platform). The agenda for the meeting is enclosed herewith

The meeting link for members who can be present in person: https://zoom.us/j/93616285925?pwd=Vmd6clNRa1l2ZUV1cEZMTm5hRnFGUT09

Meeting ID: 936 1628 5925 Passcode: iccs

Jonsalves

Dr. Marceline Fernandes, Member Secretary, Board of Studies (Commerce and Management)



16/02/2024

AGENDA

10th MEETING OF BOARD OF STUDIES - COMMERCE AND MANAGEMENT

Date of Meeting: 24/02/2024

Time: 3 pm

Mode: Hybrid

Venue: Pharmacy Conference Hall, Indira College of Pharmacy, Tathwade, Pune Online Platform: Zoom

ITEM NO.	PARTICULARS		
	Welcome note by Chairperson		
45	To seek approval of the minutes 9 th meeting of Board of Studies, Commerce and Management.		
46	 To consider and seek approval for syllabus of 1. Bachelor of Commerce- Semester III 2. Bachelor of Commerce (FM)- Semester III 3. Masters in Commerce -Semester III 		
47	Any other item with permission of the Chairperson.(Confidential and others) Comments and Announcement(If any)		
48			
	Vote of thanks to be proposed by Member Secretary		
	Announcement of Adjournment of Meeting		



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PRINCIPAL Indira College of Commerce & Science Tathwade, Pune - 411 033.

OF COMMERCE AND SCIENCE (Autonomous Status by UGC, New Delhi) Affiliated to Savitribai Phule Pune University & 'NAAC-A' Accredited ID : (PU/PN/SC/COM/166/2001) AISHE No - C-41313

SHREE CHANAKYA EDUCATION SOCIETY'S

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ANNEXURE I

Minutes of the 10th Meeting of the Board of Studies -Commerce and Management

Following members were present:

1. Dr. Nalanda Wani

- 2. Dr. Deepak Raverkar
- 34.Mr. Mohsin Nadaf
- 4. Dr. Yashodhan Mitare
- 5. Dr. Shailesh Kasande
- 6. Mr. Prathamesh Joshi
- 7. Dr. Santosh Kulkarni
- 8. Mr. Bharat Nagargoje
- 9. Dr. Marceline Fernandes
- 10. Ms. Yogita Sutar
- 11. Mr. Bharat Nagargoje
- 12. Mr. Clifford Dsouza
- 13. Ms. Rupali Shinde
- 14. Mr. Amol Gaikwad
- 15 Ms. Sheetal Deshmukh
- 16. Ms. Monika Verma

Honorable member, Dr. K. S. Hari, Dr. Vinita Shrivastava, Mr. Dinesh Panicker and conveyed his inability to attend the meeting due to certain unavoidable work.



Indira College of Commerce & Science Tathwade, Pune - 411 033.

Members of Board of Studies -Commerce and Management

Sr. No.	Number	Category	Nature	Name	Designation
01	01	Head of Department	Chairperson	Dr. Nalanda Wani	HOD Commerce ICCS, Pune
02	05	All faculty members	Members	Dr. Santosh Kulkami	Asst. Prof. Com. Dept. ICCS, Pune
				Dr. Vinita Shrivastava	Asst. Prof. Com. Dept. ICCS, Pune
				Dr. Marceline Fernandes	Asst. Prof. Com. Dept. ICCS, Pune
				Ms. Yogita Sutar	Asst. Prof. Com. Dept. ICCS, Pune
				Mr. Bharat Nagargoje	Asst. Prof. Com. Dept. ICCS, Pune
				Mr. Clifford Dsouza	Asst. Prof. Com. Dept. ICCS, Pune
				Mr. Dinesh Panicker	Asst. Prof. Com. Dept. ICCS, Pune
				Mr. Amol Gaikwad	Asst. Prof. Com. Dept. ICCS, Pune
				Ms. Rupali Shinde	Asst. Prof. Com. Dept. ICCS, Pune
				Mr. Leo Jose	Asst. Prof. Com. Dept. ICCS, Pune
				Ms. Sheetal Deshmukh	Asst. Prof. Com. Dept. ICCS, Pune
				Ms. Monika Verma	Asst. Prof. Com. Dept. ICCS, Pune
3	02	Subject Experts from	Nominated by	Dr. Deepak Raverkar	Senate Member, University of Mumbai and Principal, Sundarrao

PJNE-33. PRINCÍPAL Indira College of Commerce & Science Tathwade, Pune - 411 033.

		outside Parent University	Academic Council	Dr. V. S. Hori	More Arts, Commerce and Science College, Poladpur, Raigad.
				Dr. K. S. Hari	Assistant Professor, Gokhale Institute of Economics and Political Science, Pune
04	01		Nominated by VC SPPU	Dr. Yashodhan Mitare	Associate Dean, Faculty of Commerce and Management, Savitribai Phule Pune University
05	01	Representative from Industry	Nominated by Principal	CA. Mohsin Nadaf	Director, ESPA Education, Pune
06	01	College Alumni	Nominated by Principal	CA. Prathamesh Joshi	
07	01	Expert from outside the autonomous college	Whenever special courses of studies are to be formulated	Dr. Shailesh Kasande	CEO & Group Director, Suryadatta Group of Institutes Pune. Chairman Board of Studies, Production & Operations Management, Faculty of Commerce & Management, Savitribai Phule Pune University & Member, Academic Council.

The agenda points were taken up for discussion.

Welcome Note

The honorable chairperson, Dr. Nalanda Wani extended a warm welcome to the honorable members for the 10^h Meeting of the Board of Studies - Commerce and Management.

Item No. Nov-2024/10/45: To highlight on the minutes of meeting of 9th meeting of Board of Studies Commerce and Management.

The member secretary, Dr. Marceline Fernandes briefed about the minutes of 9th meeting of Board of Studies - Commerce and Management which was held on 24/11/2023.

Jolan P JNE-33. PRINCIPAL ndira College of Commerce & Science Tathwade, Pune - 411 033.

Discussion: No point was raised with regard to the minutes of 9th meeting of Board of Studies - Commerce and Management.

%%%%

Item No. Nov-2024/10/46: To consider and seek approval for syllabus of

1. Bachelor of Commerce Semester III

2. Bachelor of Commerce (FM) Semester III

3. Masters in Commerce (Semester III)

Discussion:

In this respect, the member secretary, Dr. Marceline Fernandes shared the structure of Semester III of the above programs and then shared the syllabus of each program one by one.

She first read the subjects from the structure of the programs and then read the syllabus contents of courses of the programs one by one. Honorable member, Dr. Deepak Raverkar, questioned on the subject, Indian Financial System which was the minor subject for B.Com. The honorable chairperson stated that, in the BCOM program the minor subject was Banking and Finance as such this course, Indian Financial System was chosen.

Honorable member Dr. Shailesh Kasande, checked on how many courses were common for B. Com and B. Com financial Markets for the semester. The member secretary replied that there were two common subject in both the programs.

Honorable member Dr. Shailesh Kasande further assured if we have formulated the integrated program. The honorable chairperson replied that the 4th Year both semesters, for M. Com and PhD. program was integrated so that the students can be benefited from the same. Honorable member Dr. Shailesh Kasande, confirmed if we had formulated the pattern of question paper for the programs. The honorable Chairperson Dr. Nalanda Wani assured that it has be formulated, approved in the earlier meeting and was documented.

The honorable chairperson, Dr. Nalanda Wani then made a request to approve the syllabus of the following:

- 1. Bachelor of Commerce Semester III
- 2. Bachelor of Commerce (FM) Semester III
- 3. Masters in Commerce Semester III

Proposed by: Dr. Nalanda Wani

Seconded by: Dr. Yashodhan Mitare

Resolution No. Nov-2024/10/46: Resolved that syllabus of 1. Bachelor of Commerce Semester III 2. Bachelor of Commerce (FM) Semester III and 3. Masters in Commerce Semester III be implemented from the second term of the academic year 2023-24

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Item No. Nov-2024/10/47 Any other item with permission of the Chairperson. (Confidential and others)

Honorable Member Dr. Mitare asked if the ABC account numbers were collected and the member secretary Dr. Marceline Fernandes replied that 90 percent of the students of First year and 95 percent of the students of second and third year have submitted their Student Id. Honorable member, Dr. Deepak Raverkar also added that the degree will not be issued without the ABC Id.

Item No. Nov 2023/9/48: Comments and Announcements (if any)

As there were no announcements, the item was considered NIL

Vote of thanks by member secretary

The member secretary, Dr. Marceline Fernandes then proposed the vote of thanks. She thanked the members for attending the meeting and giving good insights for formulating the program structures, syllabus and in the functioning of the Institute under Autonomy. She thanked the members continue support and sharing their value inputs that would benefit the students of the college.

To Announce the Adjournment of the meeting

Honorable Chairperson, Dr. Nalanda Wani declared the adjournment of the meeting.

Dr. Marceline Fernandes Member secretary BOS (Commerce and Management)

Dr. Nalanda Wani Chairperson BOS (Commerce and Management)



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