CHARUSAT

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

FEEDBACK ANALYSIS REPORT OF STAKEHOLDERS (2022-23)

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Accredited With "A" Grade by NAAC

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cspit
Chandubhai S Patel
Institute of Technology

FEEDBACK ANALYSIS REPORT OF STACKHOLDERS (A.Y.:2022-23)

U & P U Patel Department of Computer Engineering

CHARUSAT

Date: 04th May 2022

Subject: Feedback Received from Final Year students

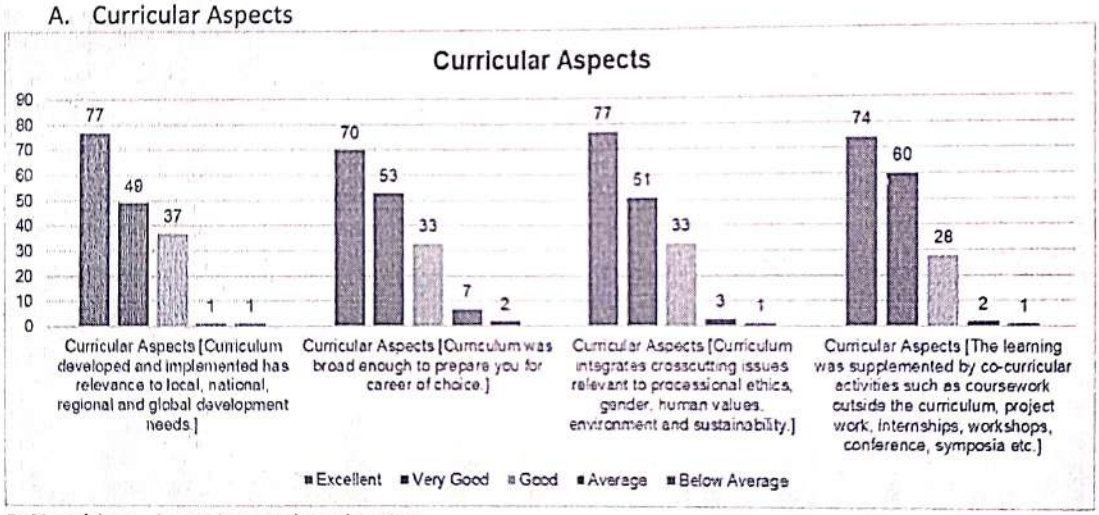
Reference Department: U & P U. Patel Department of Computer Engineering, CSPIT

This document is divided into three parts.

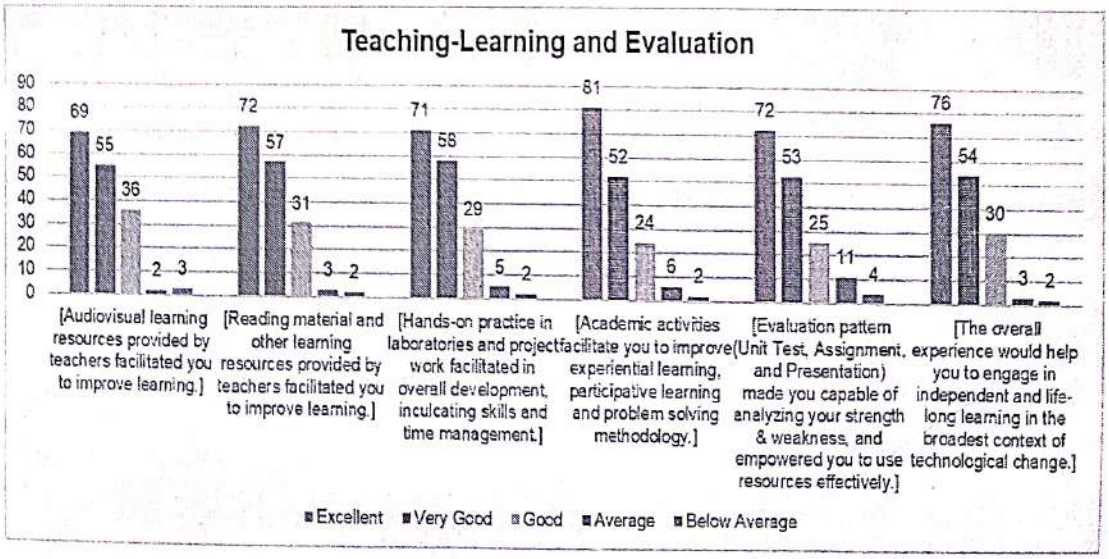
1. Part A: Bar-chart Analysis of feedback.
2. Part-B: Quantitative Analysis of feedback.
3. Part C: Written Feedback Analysis of feedback.

Part: A Bar-chart Analysis

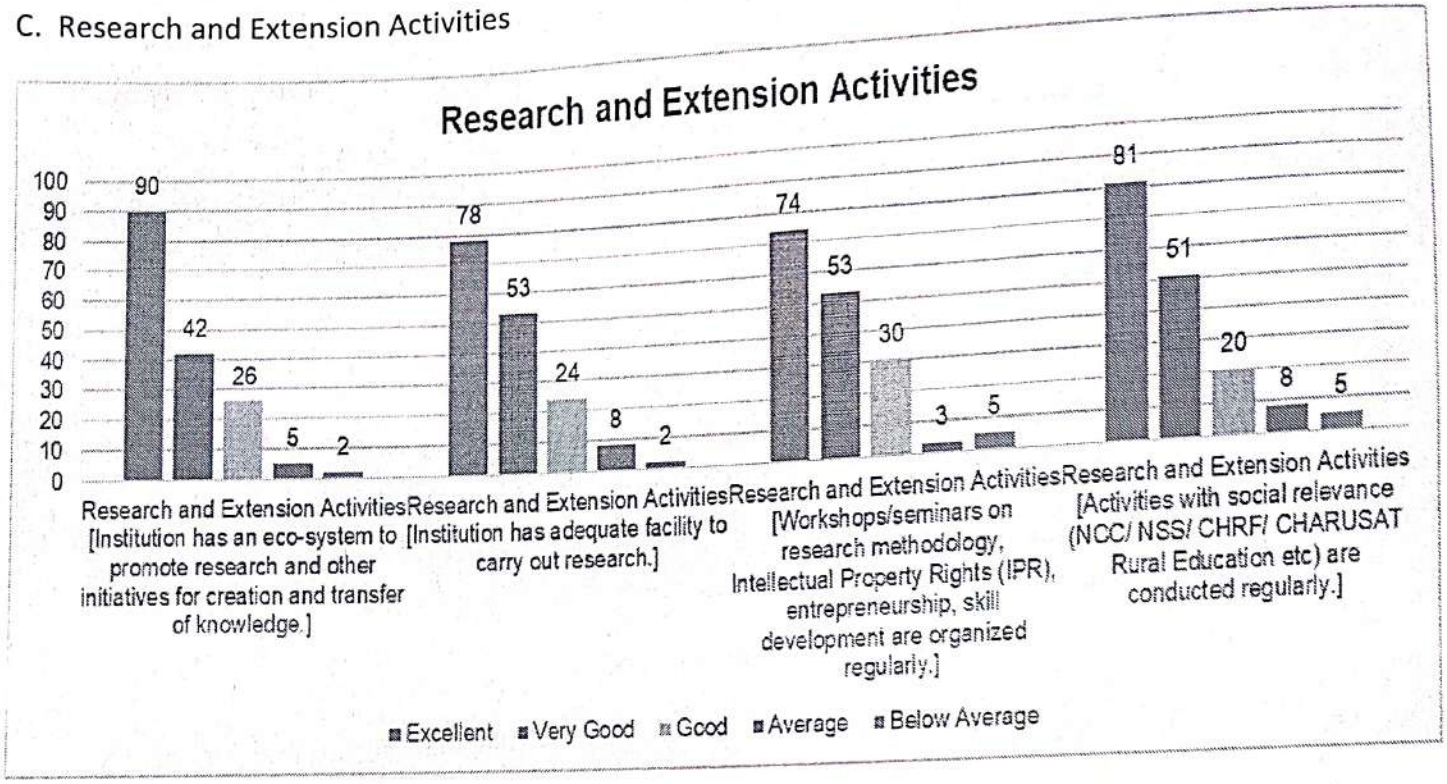
A. Curricular Aspects



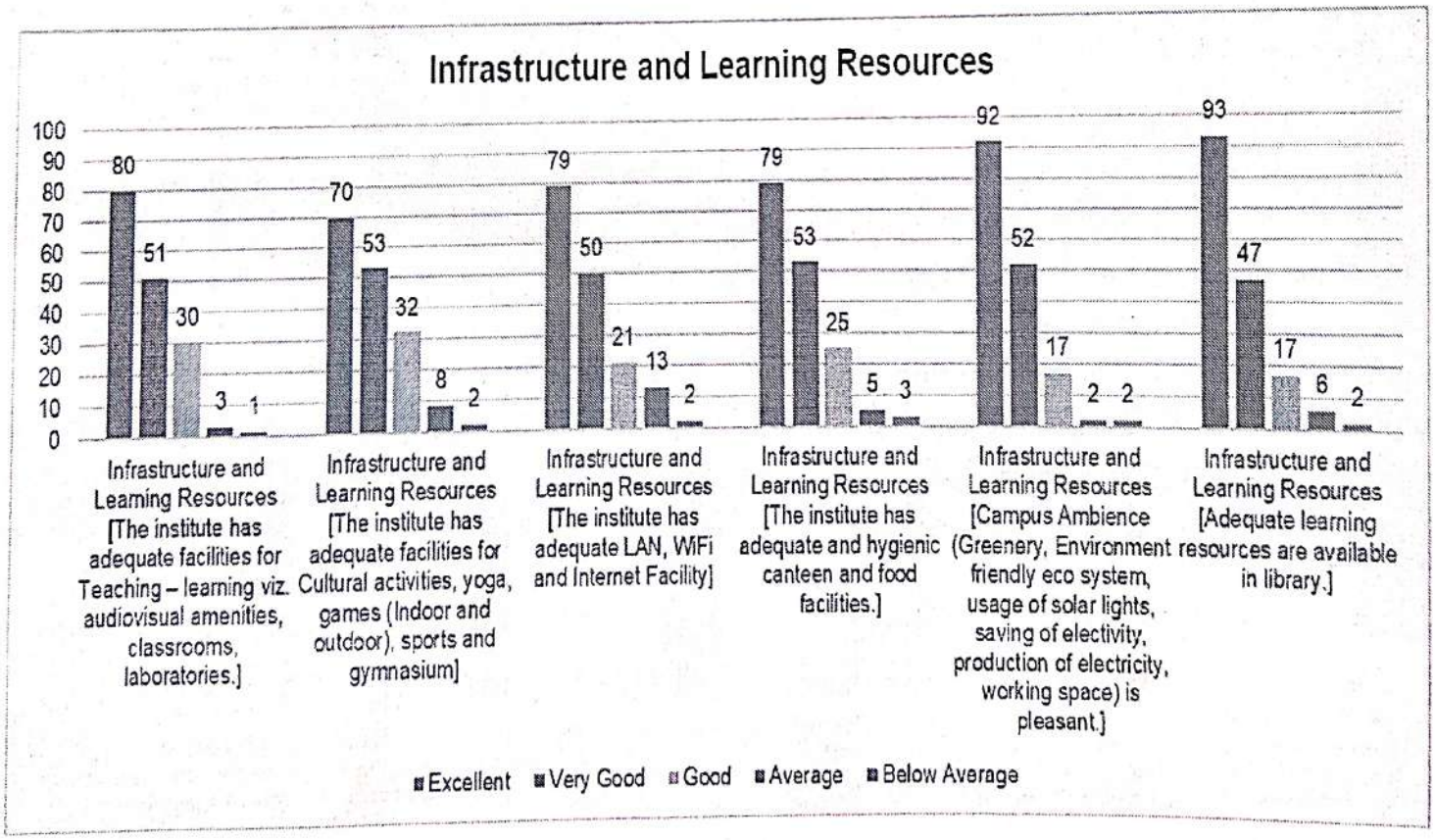
B. Teaching – Learning and Evaluation



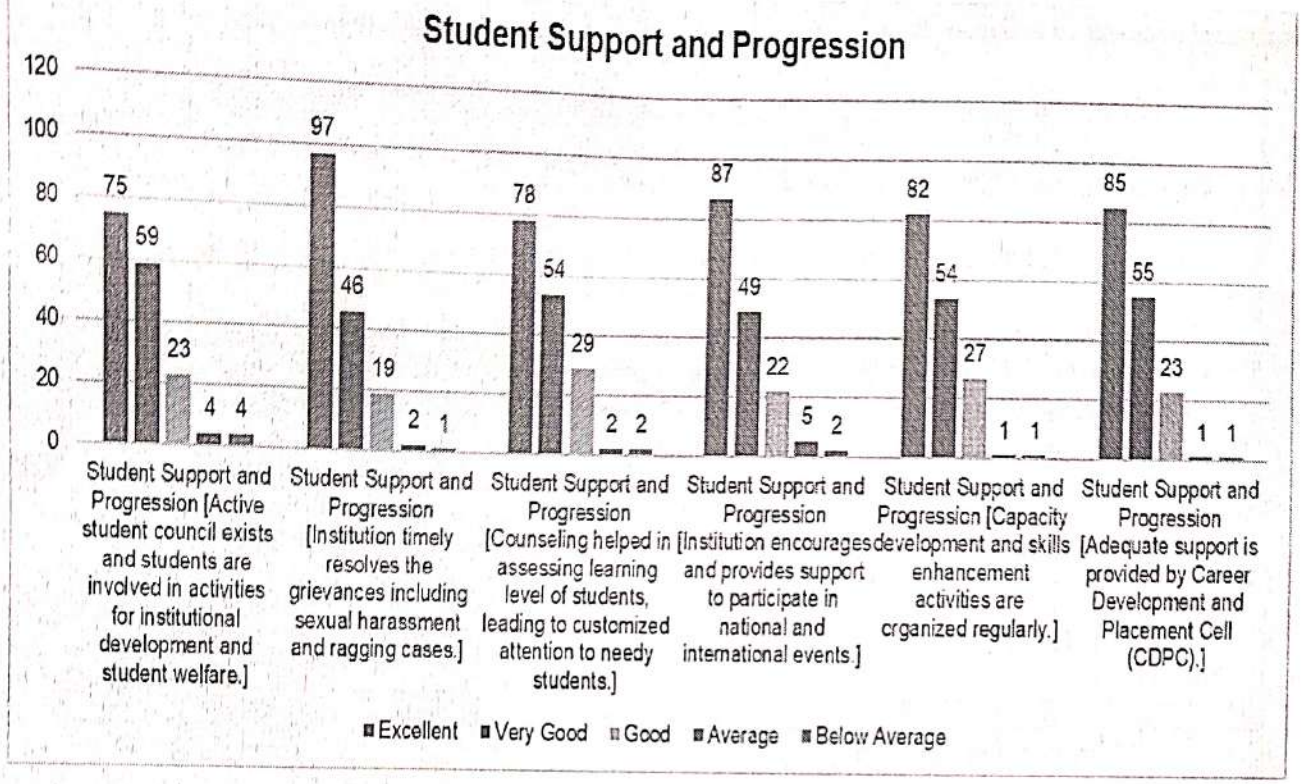
C. Research and Extension Activities



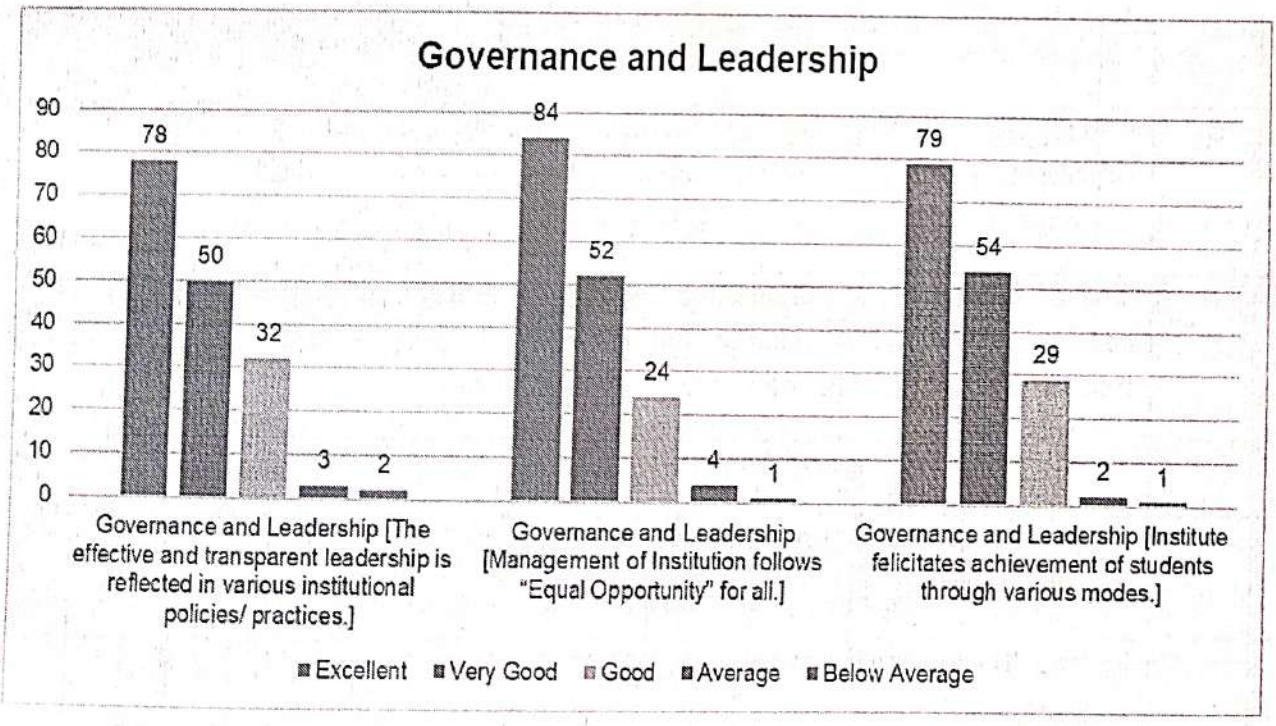
D. Infrastructure and Learning Resources



E. Student Support and Progression



F. Governance and Leadership



Part: B Quantitative Analysis

Statistical process to analyse data

Grade for a point indicator 'P' is calculated as follows, on the scale of 10.

$G_P = [(5 * N_{P5} + 4 * N_{P4} + 3 * N_{P3} + 2 * N_{P2} + N_{P1})/N] * 2$

N = Number of students who have submitted response to the point indicator 'P'.

N_{P5} = Number of students who have given 5 marks to the point indicator 'Excellent'.
N_{P4} = Number of students who have given 4 marks to the point indicator 'Very Good'.
N_{P3} = Number of students who have given 3 marks to the point indicator 'Good'.
N_{P2} = Number of students who have given 2 marks to the point indicator 'Average'.
N_{P1} = Number of students who have given 1 mark to the point indicator 'Below Average'.

Point No.	Criteria	Grade (G)
	Curricular Aspects	
1.	Curriculum developed and implemented has relevance to local, national, regional and global development needs.	8.42
2	**Curriculum** was broad enough to prepare you for career of choice.	8.20
3	**Curriculum integrates crosscutting issues** relevant to processional ethics, gender, human values, environment and sustainability.	8.42
4	The learning was supplemented by **co-curricular activities** such as coursework outside the curriculum, project work, internships, workshops, conference, symposia etc.	8.47
	Teaching-Learning and Evaluation	
5	**Learning material** provided by teachers facilitated you to improve learning.	
	(a) Audio-visual resources	8.24
	(b) Reading material and other learning resources	8.35
6	Hands-on practice in laboratories and project work facilitated in overall development, inculcating **skills and time management.**	8.31
7	Academic activities facilitate you to improve **experiential learning, participative learning and problem solving methodology.**	8.47

8	**Evaluation pattern** (Unit Test, Assignment, and Presentation) made you capable of analysing your strength & weakness, and empowered you to use resources effectively.	8.15
9	The overall experience would help you to engage in independent and **life-long learning** in the broadest context of technological change.	8.41
	Research and Extension Activities	
10	Institution has an eco-system to promote research and other initiatives for creation and transfer of knowledge.	8.58
11	Institution has adequate facility to carry out research.	8.38
12	Workshops/seminars on research methodology, Intellectual Property Rights (IPR), entrepreneurship, skill development are organized regularly.	8.27
13	Activities with social relevance (NCC/ NSS/ CHRF/ CHARUSAT Rural Education etc) are conducted regularly.	8.36
	Infrastructure and Learning Resources	
14	The institute has adequate facilities for	
	(a) Teaching – learning viz. audiovisual amenities, classrooms, laboratories.	8.49
	(b) Cultural activities, yoga, games (Indoor and outdoor), sports and gymnasium.	8.19
15	The institute has adequate LAN, WiFi and Internet Facility.	8.31
16	The institute has adequate and hygienic canteen and food facilities.	8.42
17	Campus Ambience (Greenery, Environment friendly eco system, usage of solar lights, saving of electivity, production of electricity, working space) is pleasant.	8.78
18	Adequate learning resources are available in library.	8.70
	Student Support and Progression	
19	Active student council exists and students are involved in activities for institutional development and student welfare.	8.38
20	Institution timely resolves the grievances including sexual harassment and ragging cases.	8.86
21	Counseling helped in assessing learning level of students, leading to customized attention to needy students.	8.47

22	Institution encourages and provides support to participate in national and international events.	8.59
23	Capacity development and skills enhancement activities are organized regularly.	8.60
24	Adequate support is provided by Career Development and Placement Cell (CDPC).	8.69
	Governance and Leadership	
25	The effective and transparent leadership is reflected in various institutional policies/ practices.	8.41
26	Management of Institution follows "Equal Opportunity" for all.	8.59
27	Institute felicitates achievement of students through various modes.	8.52

Average Grade Point:

Sr. No.	Criterion	Corresponding Aspects	Grade point Formula	Grade point (10)
1	Curricular Aspects	G1-G4	$(G_1 + G_2 + G_3 + G_4)/4$	**8.38**
2	Teaching-Learning and Evaluation	G5-G10	$(G_5 + G_6 + G_7 + G_8 + G_9 + G_{10})/6$	**9.90**
3	Research and Extension Activities	G11-14	$(G_{11} + G_{12} + G_{13} + G_{14})/4$	**8.40**
4	Infrastructure and Learning Resources	G15-G20	$(G_{15} + G_{16} + G_{17} + G_{18} + G_{19} + G_{20})/6$	**8.48**
5	Student Support and Progression	G21-G26	$(G_{21} + G_{22} + G_{23} + G_{24} + G_{25} + G_{26})/6$	**8.60**
6	Governance and Leadership	G27-G29	$(G_{27} + G_{28} + G_{29})/3$	**8.50**

Rubrics Table:

Sr. No.	Criterion	Category (Grade point range)		
		0-3.5 (C)	3.6-7.0 (B)	7.1-10.0 (A)
1	Curricular Aspects	Curriculum is poorly designed. Process to design curriculum should be redefined.	Curriculum is not meeting the current trend. Gather relevant information from different stack holders and modify curriculum in line of requirement of employers.	Curriculum does not require major alterations. You may enhance the perception of stake holders through incorporating new approaches.
2	Teaching-Learning and Evaluation	Major corrections are to be suggested and implemented to enhance Teaching-Learning and Assessment Activity	You may critically review the feedback and find the functional issues. You may suggest specific modification in activities and implement those.	Minor changes in to teaching learning and evaluation should be implemented as per suggestion of stake holders. You may proceed for continuous improvement.
3	Research and Extension Activities	Acute response is needed to boost Research and Extension Activities. You may take this as priority task.	Review infrastructure, reliability of machines, ancillary facility and approach of research supervisors to students and their approach to research. Find the GAPs and run Plan –Do- Check – Act cycle.	Try to enhance the impact factor of manuscripts published, Total number of citation and h-index of institute should be improved year to year. Try to get funding from government agencies.
4	Infrastructure and Learning Resources	Find the non-functional resource or lack of infrastructure	Find the lacuna and focus on maintenance or purchase and try to enhance the quality of experience.	You may think /propose for advancement in facility.
5	Student Support and Progression	Check functioning of each and every student support activity. Get feedback from faculties involved there and find the problems appear in functioning.	Have a meeting with students and try to find out whether they receive the support from institute and try to know the expectation from students. A meeting with student councilors is recommended. Find the parameters which created the fall in grade and do necessary steps to enhance the support.	Try to enhance co-curricular and extracurricular participation. Students should win the events. Improve /Establish student chapter or Innovation council etc. Keep the track on Training and Placement and ensure the improvement.
6	Governance and Leadership	Review implementation of process. Ensure that all the necessary information must be	Find specific area in which performance is average or less than average i.e 60% of respondents put that activity on mid level. Focus on those	A scope of innovation is there to enhance the function of various activities.

		disseminate to stake holder. Meet the co ordinators and encourage them to involve students in various activities.	cells/activities and prepare strategy to enhance those.	

Action Table:

Sr. No.	Criterion	Grade point (10)	Category (From Above Table)
1	Curricular Aspects	8.38	A
2	Teaching-Learning and Evaluation	9.90	A
3	Research and Extension Activities	8.40	A
4	Infrastructure and Learning Resources	8.48	A
5	Student Support and Progression	8.60	A
6	Governance and Leadership	8.50	A

REDRESSEL MECHANISM

- The feedback form to be scrutinized and specific suggestions can be discussed and incorporated by the respective committees.
- Feedbacks related to curriculum and teaching-learning & evaluation to be discussed first at the Departmental Level
- If required, will be taken up by the Academic Supervisory Committee.
- If not resolved, will be referred to a committee formed at the next higher level by the management (Principal / Competent Authority).

[May not required]

Formula to calculate weighted average grade point

Sr. No.	Criterion	Corresponding Aspects	Grade point (10) [A]	Weight (as per NAAC) [B]	[A] X [B]
1	Curricular Aspects	G1-G4	8.38	0.16	1.34
2	Teaching-Learning and Evaluation	G5-G10	9.90	0.23	2.28
3	Research and Extension Activities	G11-14	8.40	0.28	2.35
4	Infrastructure and Learning Resources	G15-G20	8.48	0.11	0.93
5	Student Support and Progression	G21-G26	8.60	0.11	0.95
6	Governance and Leadership	G27-G29	8.50	0.11	0.94
			52.26	1	8.79

Weighted average grade point = $\sum$ ([A] X [B])/ $\sum$[B]= **8.79**

Part: C Written Feedback Analysis.

Received feedback are divided into six categories. Annexure-1 contains detailed feedback.

1. Academic Schedule
2. Activities
3. Administration
4. Curriculum
5. Training & Placement
6. Teaching Learning

Review meeting was conducted among faculties of CE Dept. Following action plan is agreed by all teachers to be executed from the next academic term.

1. Academic Schedule
2. Activities
3. Administration
4. Curriculum
5. Training & Placement
6. Teaching Learning

Annexure-1

Positive Suggestions

- It was a great experience at CHARUSAT. The only thing which feels bad is covid took many things from us before we could experience it
- It is a very good university. No more suggestions, enjoyed life here and thanks to all the faculties
- It has been an interesting number of years and I have enjoyed the majority of it and it has definitely kept me busy and kept me learning new things almost every day. A million thanks!
- Overall this subject has some great career development aspects which needs to be followed by students.
- The curriculum of the year & evaluation are upto the point so there are no suggestions related to it
- We would like to thank Charusat University and CSPIT for giving us an opportunity to develop our skills. All subjects were best as a beginner level. The university has given its best to make our future better. The atmosphere of the university, lab, class, and teacher is very good. The university has given us advice and guidance not only in the field of education but also in the field of career.
- It was a great experience to be on campus.
- it is good for students to study here
- Curriculum should be industry oriented instead of GATE oriented.

Academic Schedule: N.A.

Activities

- More emphasis on development skills with relevant subjects

Administration

- Increase the number of copies of book material in the library.

Curriculum: N.A.

Training & Placement

- Please Prepare students for Entrepreneurship starting from college First year and help them to gain knowledge about how they can start Any company or business. And Please also Provided them with information on how they can find problems in the real world so it could help them to develop unique solutions for that problem. If this college prepares students only for jobs then this college is never going to be the same as IIT, and because of that Students are never going to contribute a major part of Indian wealth as we need more Unicorn companies.

Teaching Learning

- Semester projects should follow an industry level development process. Development process used in college is far outdated.

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Feedback Analysis
Academic Year: 2022-23

Chandubhai S Patel Institute of Technology

No of Employers: 13

Scale: 5: Strongly Agree, 4: Agree, 3: Neutral, 2: Disagree, 1: Strongly Disagree

Sr. No	Criteria	5	4	3	2	1	Average	% Response
1	Technical knowledge and skills of the students are up to date.	1	10	2	0	0	3.92	78.46
2	Curriculum provides adequate knowledge and training to the students.	3	9	1	0	0	4.15	83.08
3	Curriculum has rich content which ensures problem solving, leadership & managerial skill.	3	7	3	0	0	4.00	80.00
4	Students maintain good interpersonal relations with their colleagues and seniors.	8	5	0	0	0	4.62	92.31
5	Students volunteer themselves for new initiations of organization.	3	7	3	0	0	4.00	80.00
6	Students mold themselves as per need of organization.	6	6	1	0	0	4.38	87.69
7	Curriculum facilitated students to attain the desired competency level.	3	9	1	0	0	4.15	83.08
8	Curriculum enriched the moral values among students.	3	7	3	0	0	4.00	80.00
9	Curriculum transaction sensitized them about team work.	2	10	1	0	0	4.08	81.54
10	Communication skills of students are good.	4	5	3	1	0	3.92	78.46
	Average						4.12	82.16 %

Average: (a*5) + (b*4) + (c*3) + (d*2) + (e*1) / Total no of responses
% response: (Average * 100)/5

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Feedback Analysis
Academic Year: 2022-23

Chandubhai S Patel Institute of Technology

Course Specific Comments:
None

Additional Suggestions and Remarks if any:

- I feel some additional weightage on programming techniques and practices may help them to develop program in more maintainable and flexible. This may include understanding and exposure to web application development, multi-tier architecture. By the end of 7 semesters, students should be able to gain some experience of reusability with common functions and classes, no hardcoding, API development, use of some various libraries, tools and frameworks. The group level projects at each level (semester) may have more specific contents for students to be able to implement their learning upto that semester and be able to enhancing the program they developed till previous semester with new programming techniques.
- Student is competent in his knowledge and possess qualities to adapt easily to new changing work environment.
- The students are good and up to the mark. but I feel that there should be some kind of way to connect to the students who are in 5th and 6th semester so that we can guide them on the right path on very early stages of their programming journey.

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Feedback Analysis
Academic Year: 2022-23
Odd Semester : 1,3,5,7

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Date of Meeting: For semester 3,5,7: **24th September 2022.** For semester 1: **3rd December 2022**
Venue of meeting: Off line
No of Parents attendees: 18(Sem 3,5,7) +9(Sem 1)=**27**

Scale: 4: Excellent, 3: Good, 2: Satisfactory, 1: Needs Improvement

Sr. No	Criteria	4	3	2	1	Average	% Response
1	Curriculum	11	10	4	0	3.136364	78.40909
2	Teachers Quality	17	7	3	0	3.318182	82.95455
3	Infrastructure	16	8	1	0	3.318182	82.95455
4	Teaching Methodology	16	8	2	0	3.090909	77.27273
5	Lab Facilities	16	8	2	0	3.181818	79.54545
6	Library Facilities	12	9	5	0	3	75
7	Training & Placement Support	10	8	6	0	3.136364	78.40909
8	Internal Exam Evaluation	12	7	5	2	2.772727	69.31818
9	Hostel Facilities	4	4	4	0	2.136364	53.40909
10	Transportation Facilities	6	5	2	2	2.409091	60.22727
11	Programmers Organized by the department for providing industry exposure	12	7	2	1	2.727273	68.18182
12	Student Mentoring & Counseling	15	8	2	0	3.181818	79.54545
	Average					2.88	72.2 %

Average: (a*4) + (b*3) + (c*2) + (d*1) / Total no of responses
% response: (Average * 100)/4

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Feedback Analysis
Academic Year: 2022-23
Odd Semester : 1,3,5,7

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Additional Suggestions and Remarks if any:

1 Schedule of PTM Should be given in Advance.
2 Teachers are really Supportive.
3 There may me Separate staff for guidance of further studies.
4 Provide guidance of extracurricular activities.
5 Give the Support to students for more practical practices.

Actionable insights of Event :/
Below is the feedback received from parents during PTM:

Sr.No.	Feedback/Questions	Resolutions
1.	Parents have queries related to placement policy	TNP Officer Dr. Ashwin Makwana interacted with parents and discuss about the placement policy. According to policy, one student can accept offer letters of two companies as per criteria, Parents are satisfied and convinced with the mentioned points.
2.	Parents are expecting to have more practical exposure to their wards.	We have discussed execution plan of various courses along with the various programming platform like hacker rank, code chef, leetcode which enhance the competitive programming ability of students. Also discuss about the various programming clubs and their activities.
3	Attendance criteria should be revised and lower by 5-10 % so that students can be encouraged to participate in extra activities and project activities.	Discuss about 20% overall relaxation is given to students. Mentioned the supplement exam, which is going to be conducted at the end of semester.
4	There should be special staff/counselor to guide for further studies abroad	Various sessions have been arranged by the experts and by the alumni to discuss on career path selections

Parents are satisfied with admission decision. They feel all the teachers are supportive and everything is up to the expectation. Parents are happy to attend the meeting.

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Feedback Analysis
Academic Year: 2022-23
Even Semester : 2

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Date of Meeting: 17,20,23,24,27/05/2023
Venue of meeting: Online Through Microsoft team
No of Parents attendees: 18

Scale: 4: Excellent, 3: Good, 2: Satisfactory, 1: Needs Improvement

Sr. No	Criteria	4	3	2	1	Average	% Response
1	Student mentoring, counselling and care being taken by Faculties	7	7	4	0	2.5909	64.772727
2	overall satisfaction about the department and University.	6	8	4	0	2.5455	63.636364
	Average					2.56	64.2%

Average: (a*4) + (b*3) + (c*2) + (d*1) / Total no of responses
% response: (Average * 100)/4

Additional Suggestions and Remarks if any:

- One to one conversation with student will help to avoid distraction and will keep student on track.
- About Hostel facilities - kindly provide hostel facilities for students of Vadodara also.
- Excellent support, mentoring, counseling and caring by faculty and staff.
- Inform us about holidays and working days
- Parents meeting not followed by given Agenda

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Feedback Analysis
Academic Year: 2022-23
Even Semester : 4,6,8

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Date of Meeting: 25th March to 8th April, 2023
Venue of meeting: Online Through Microsoft team
No of Parents attendees: 22

Scale: 4: Excellent, 3: Good, 2: Satisfactory, 1: Needs Improvement

Sr. No	Criteria	4	3	2	1	Average	% Response
1	Curriculum	8	9	5	0	3.136364	78.40909
2	Teachers Quality	12	5	5	0	3.318182	82.95455
3	Infrastructure	11	7	4	0	3.318182	82.95455
4	Teaching Methodology	7	10	5	0	3.090909	77.27273
5	Lab Facilities	10	7	4	1	3.181818	79.54545
6	Library Facilities	7	8	7	0	3	75
7	Training & Placement Support	9	9	2	2	3.136364	78.40909
8	Internal Exam Evaluation	6	7	8	0	2.772727	69.31818
9	Hostel Facilities	1	7	8	6	2.136364	53.40909
10	Transportation Facilities	3	7	8	4	2.409091	60.22727
11	Programmers Organized by the department for providing industry exposure	5	8	7	2	2.727273	68.18182
12	Student Mentoring & Counseling	9	8	5	0	3.181818	79.54545
13	Technical knowledge acquired by your ward after admission to our Department/Institute	8	8	4	2	3	75
14	Communication and Interpersonal skills acquired by your ward after admission to our Department/Institute	8	12	2	0	3.272727	81.81818
	Average					2.9	74.4 %

Average: (a*4) + (b*3) + (c*2) + (d*1) / Total no of responses
% response: (Average * 100)/4

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Feedback Analysis
Academic Year: 2022-23
Even Semester : 4,6,8

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The parents would like to contribute to reform the syllabus and Practical list of the following subjects:

Sr.No.	Subject Name
1.	C Programming
2.	Object Oriented Programming with C++
3.	Java Programming
4.	Data Structures & Algorithms
5.	Microprocessor and Computer Architecture
6.	Database Management System
7.	Software Engineering
8.	Computer Network
9.	Machine Learning
10.	Mobile App Development
11.	Block chain Technology
12.	Deep Learning
13.	Cloud Computing
14.	Data Analytics
15.	Theory of Computation
16.	Natural language Processing
17.	Information Security
18.	Internet of Things

Additional Suggestions and Remarks if any:

Focus should also be given to Personality Development, Communication improvement, Problem solving mindset, placement

More hands on practical exposure should be given to the students for online internal exam-2 before final exam as they are new to this technique and required practice to cope with it

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Academic Year: 2022-23

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No of Academic peers: 63

Scale: 4: Excellent, 3: Good, 2: Satisfactory, 1: Needs Improvement

Sr. No	Criteria	4	3	2	1	Average	% Response
1	Course outcomes are well defined	46	11	2	4	3.57	89.29
2	Course content reflects industry perception / competitive exams	44	18	1	0	3.68	92.06
3	Course content reflects research perception	24	30	3	1	3.06	76.59
4	Sufficient reading materials and digital resources provided	50	11	1	0	3.73	93.25
5	Incorporation of advanced topics	34	23	1	2	3.32	82.94
6	Assessment tools measure the course outcomes	46	17	0	0	3.73	93.25
7	Pedagogy proposed has a desired balance between theory and practical	50	12	1	0	3.78	94.44
8	Quality of micro/mini project component	31	13	5	4	2.81	70.24
9	Content of practical list	45	12	3	1	3.54	88.49
	Average					3.47	86.73

Average: (a*4) + (b*3) + (c*2) + (d*1) / Total no of responses
% response: (Average * 100)/4

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Course Specific Comments:

Course Code	Course Name	Are there any topics that should be dropped from the course?	Are there any topics that should be added to the course?
CE143	Computer Concepts and Programming	-	Graphics header file functions can be included
CE143	Computer Concepts and Programming	-	GCC library, source from gnu.org
CE257	Data Communication & Networking	-	Pedagogical change is required. Mini Project Micro Project should be added
CE354	Operating System	-	At least 5 shell scripts should be part of the practical list. So first 3 to 4 practical based on the commands, rest 4 to 5 practical for shell scripting, 1 practical for process management system call and 1 practical for CPU threads. Scheduling, DMA, disk scheduling, IPC, Banker's algorithm, page replacement algorithms, detection algorithm can be given as mini project.
CE355	Design & Analysis of Algorithms	-	Huffman coding, Optimal merge pattern
CE377	Advanced Web Technology	-	TypeScript and NestJS should be added in Syllabus
CE343	Software Engineering	CASE, Advance Topics, SaaS, QA(ISO/CMM)	DevOps
CE343	Software Engineering	-	Use of GitHub can be introduced in the course that may help students to collaborate, control their project versions and solve the open issues. Role-based learning may help in course project
CE444	Internet of Things	-	In place of many theory concept, in place of practical list, it can be directly included in the structure of IoT.
CE442	Design of Language Processors	-	Practical - YACC programs updation

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CE476	Machine Learning	Bayesian Learning, Kernel Methods	-
CE476	Machine Learning	-	Transformer in tis course or even advance course of this. Make sure to add use cases which help students to understand the scenarios where they can apply logic.
CE474	Blockchain Technology	-	HFT
CE474	Blockchain Technology	-	Other blockchain based platform
CE443	Cloud Computing	Unit 1 and Combine Unit 5 and 6	add more on AWS associate practitioner and DevOps
CE450	Software Group Project V	-	Cloud Computing with AI
CE144	Object Oriented Programming with C++	-	STL and Exception Handling
CE144	Object Oriented Programming with C++	-	Exception Handling
CE245	Data Structures and Algorithms	-	Skip list and counting sort, introduce various competitive platform in practicals
CE246	Database Management System	Query Processing should be removed and related to that could add In Memory database introductory content	Partial components of DBA
CE259	Programming in Python	-	Decorators
CE259	Programming in Python	-	decorators
CE255	SGP II	Need to focus on about basic terminology and diversity is needed in technology	Spring Boot, other NoSQL Database
CE348	Information Security	Last few chapters need to modify	Yes, few more concepts like object space security can included

CE358	Computer Network	DCN and CN should be combined as there are overlaps	Data center networking
CE374	Service Oriented Computing	-	Practical / mini task involving end to end activity of service creation, deployment and use in UI
CE374	Service Oriented Computing	WS extension can be dropped from the syllabus	message broker, microservices, Graph Q2 can be added
CE379	IP & CV	IP & CV should be separate courses.	-

Additional Suggestions and Remarks if any:

Course Code	Course Name	Remarks/Suggestions
CE145	Basics of Digital Electronics	Everything is nicely covered. Student fundamentals are excellent.
CE246	Database Management System	No, course is nicely designed
CE357	Artificial Intelligence	No, all the topics are strongly relevant to the subject
CE379	IP & CV	IP & CV should be separate subjects. CO-PO mappings need to be revised. Reduce no of mapping

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Feedback Analysis
Academic Year: 2022-23

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No of Alumni: 42

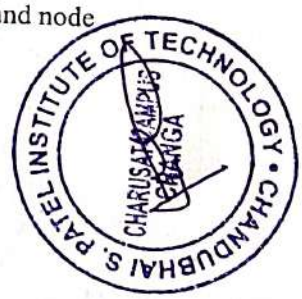
Scale: 5: Excellent, 4 : Very Good, 3: Good, 2: Satisfactory, 1: Needs Improvement

Sr. No	Criteria	5	4	3	2	1	Average	% Response
1	The Course relevance of the degree obtained with respect to your current job/position is:	18	15	6	1	2	4.09	81.90
2	When you meet students, who have taken a similar Program at other universities, you feel that your Program is:	22	15	5	0	0	4.4	88.09
3	Rate the overall curriculum	19	18	5	0	0	4.33	86.66
4	The Course relevance of the degree obtained with respect to your current job/position is:	18	15	6	1	2	4.09	81.9
	Average						4.23	84.64

Average: (a*4) + (b*3) + (c*2) + (d*1) / Total no of responses
% response: (Average * 100)/4

Additional Comment:

- Courses are all excellent but some good package could be offered as Assistant Professor
- Every course is Good as per Semester. Put some personal courses which depending on our life. Like, family values, Relationship of Each other, Stay away from Addiction etc..
- Excellent
- Front end understanding for latest technology
- Sem- 3 web development
- This course needs to add some practice questions of some competitive exam such as GATE thus student can learn problem solving skills
- Web Technologies - Sem4 - should include more topics for angular and node



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Feedback Analysis
Academic Year: 2022-23

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Action Plan

Feedback Received from final year students:

Stack Holder	No of feedback Received	% feedback analysis
Students	165	84.5%

Sr. No.	Suggestions/Remarks	Resolution/Action Plan
1.	Curriculum should be industry oriented instead of GATE oriented.	Industry professionals are engaged to contribute the development of the curriculum development based on current industry demands and trends. The Curriculum emphasizes more on the integration of practical skills and hands-on experience. Actively seek collaboration with industry partners and experts to provide input, guidance, and real-world context to the curriculum development process.
2.	Prepare students for Entrepreneurship starting from college First year and help them to gain knowledge about how they can start Any company or business	During Commencement celebration at Charusat, Dr. Jaimin Undavia , Associate Professor , CMPICA gave introduction to students about Student Startup and Innovation Policy (SSIP) on 17th July 2023. Dr. Swati Joshi, Senior Executive Officer of CIVF introduced students about Charusat Innovative Ventures Foundation (CIVF) cell at Charusat on 13th July 2023.
3.	Provided them with information on how they can find problems in the real world so it could help them to develop unique solutions for that problem	In every semester, Students have a Software Group Project where they can be guided on finding the real world problems. Faculties mentor them for various state level and national level hackathons.

Action Plan

		Ideathon can be planned to expose the various problems at University level and students can avail the opportunity to solve and deploy the software at University.
4.	Semester projects should follow an industry level development process.	In Software Engineering course and Software Group Project we have included industry related live client based project in BTech 5th semester with all industry level practices like SRS, SPMP, Designing, Coding standards, Testing and Documentation etc. We have also implemented GIT, JIRA and other CASE tools.

Feedback Received from Employers:

Stack Holder	No of feedback Received	% feedback analysis
Employers	13	82.5%

Sr. No.	Suggestions/Remarks	Resolution/Action Plan
1.	Some additional weightage on programming techniques and practices may help them to develop program in more maintainable and flexible	Incorporate real-world case studies and projects that require students to apply programming techniques to practical scenarios, enhancing their problem-solving abilities. Various activities are arranged under gamma club to enhance the programming skill capabilities. Industry experts are invited to share the best practices adopted in the industry.
2.	This may include understanding and exposure to web application development, multi-tier architecture. By the end of 7 semesters, students should be able to gain some experience of reusability with common functions and classes, no hardcoding, API	Introduce students to web application development, ensuring they gain a deep understanding of web technologies and frameworks. Curriculum includes various libraries, tools, and frameworks commonly used in the industry, ensuring students are

Action Plan

	development, use of some various libraries, tools and frameworks.	well-prepared to work with modern technologies. Encouraging students to stay updated with emerging technologies and industry trends in web development.
3.	There should be some kind of way to connect to the students who are in 5th and 6th semester so that we can guide them on the right path on very early stages of their programming journey.	Various career counselling sessions are arranged by alumni and also from industry experts to help students to understand the various career paths available in programming and guide them in choosing the right direction. Industry experts are invited to deliver guest lectures, sharing insights into the programming industry and offering advice to students. In various courses, project-based learning are introduced where students work on real-world projects and apply their programming skills in practical scenarios.

Feedback Received from Parents:

Stack Holder	No of feedback Received	% feedback analysis
Parents	67	73%

Sr. No.	Suggestions/Remarks	Resolution/Action Plan
1.	Parents have queries related to placement policy	TNP Officer Dr. Ashwin Makwana interacted with parents and discuss about the placement policy. According to policy, one student can accept offer letters of two companies as per criteria, Parents are satisfied and convinced with the mentioned points.
2.	Parents are expecting to have more practical exposure to their wards.	We have discussed execution plan of various courses along with the various programming platform like hacker rank, code chef, leetcode which

Action Plan

		enhance the competitive programming ability of students. Also discuss about the various programming clubs and their activities.
3.	Attendance criteria should be revised and lower by 5-10 % so that students can be encouraged to participate in extra activities and project activities.	Discuss about 20% overall relaxation is given to students. Mentioned the supplement exam, which is going to be conducted at the end of semester.
4.	There should be special staff/counselor to guide for further studies abroad	Various sessions have been arranged by the experts and by the alumni to discuss on career path selections

Feedback Received from Teachers:

Stack Holder	No of feedback Received	% feedback analysis
Teachers	63	87%

Sr. No.	Suggestions/Remarks	Resolution/Action Plan
1.	CE251 – Java Programming – Modify practical list and if possible, add micro projects.	Practical list is modified and micro projects have been added. Refer Annexure I
2.	CE354 – OS - At least 5 shell scripts should be part of the practical list. So first 3 to 4 practical based on the commands, rest 4 to 5 practical for shell scripting, 1 practical for process management system call and 1 practical for CPU threads. Scheduling, DMA, disk scheduling, IPC, Banker's algorithm, page replacement algorithms, detection algorithm can be given as mini project.	Modified practical list of OS and added more shell scripts. Refer Annexure II
3.	CE374 – SOC - message broker, microservices, Graph Q2 can be added, Practical / mini task involving end to end activity of service creation, deployment and use in UI	Refer Annexure III
4.	CE358 – Computer Networks - DCN and CN should be combined as there are overlaps	From AY 2023-24, CE262 - DCN will be offered in which the concepts of CE358 – CN and CE257 – DCN are combined as per industry requirement.

Action Plan

5.	CE245 – DSA - Skip list and counting sort, introduce various competitive platform in practical	Refer Annexure IV
6.	CE355 – DAA - Huffman coding, Optimal merge pattern can be added	Refer Annexure V

Feedback Received from Alumni:

Stack Holder	No of feedback Received	% feedback analysis
Alumni	63	84.64%

Sr. No.	Suggestions/Remarks	Resolution/Action Plan
1.	Every course is Good as per Semester. Put some personal courses which depending on our life. Like, family values, Relationship of Each other, Stay away from Addiction etc..	Interactive workshops and seminars are arranged on family values, communication, and healthy relationships, allowing students to actively participate and learn through practical experiences. Experts, psychologists, and motivational speakers are invited to deliver talks and sessions on life skills, providing students with diverse perspectives and insights. Counselling services are offered for students who may be struggling with personal issues, addiction, or relationships, providing them with professional support.
2.	Front end understanding for latest technology	Following Front-End Framework Covered through Technical Article and in Laboratory Session. 1. ReactJS (In Lab Session and Technical Article) 2. ViewJS (Technical Article) 3. AngularJS (Technical Article)
3.	This course needs to add some practice questions of some competitive exam such as GATE thus student can learn problem solving skills	Many courses have included practice questions from competitive exams like GATE, aimed at enhancing students' problem-solving skills.

Action Plan

		Interactive discussions or workshops are arranged where students can collaborate to solve complex problems and share their problem-solving strategies. Provide detailed solutions and explanations for the past questions to help students understand the problem-solving techniques and concepts involved.

Annexure I

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Faculty of Technology and Engineering

U & P U. Patel Department of Computer Engineering

Date: 10/11/22

Academic Year	:	22-23	Semester	:	3rd
Course code	:	CE-251	Course name	:	Java Programming

Sr. No.	Criteria	Please tick (√) where applicable			
		Excellent	Good	Satisfactory	Needs Improvement
		4	3	2	1
1.	Course outcomes are well defined	✓			
2.	Course content reflects industry perception / competitive exams	✓			
3.	Course content reflects research perception	✓			
4.	Sufficient reading materials and digital resources provided		✓		
5.	Incorporation of advanced topics	✓			
6.	Assessment tools measure the course outcomes	✓			
7.	Pedagogy proposed has a desired balance between theory and practical	✓			
8.	Quality of micro/mini project component	✓			
9.	Content of practical list	✓			

Are there topics that should be dropped from the course?

— N/A —

Are there topics that should be added to the course?

— N A —

Name of Faculty: Visal Patel

Signature:

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Chandubhai S Patel Institute of Technology

Faculty of Technology and Engineering

U & P U. Patel Department of Computer Engineering

Date: 10/11/22

Academic Year	:	2022-23	Semester	:	3rd
Course code	:	CE251	Course name	:	Java programming.

Sr. No.	Criteria	Please tick (√) where applicable			
		Excellent	Good	Satisfactory	Needs Improvement
		4	3	2	1
1.	Course outcomes are well defined	✓			
2.	Course content reflects industry perception / competitive exams	✓			
3.	Course content reflects research perception	✓			
4.	Sufficient reading materials and digital resources provided		✓		
5.	Incorporation of advanced topics	✓			
6.	Assessment tools measure the course outcomes	✓			
7.	Pedagogy proposed has a desired balance between theory and practical	✓			
8.	Quality of micro/mini project component	✓			
9.	Content of practical list	✓			

Are there topics that should be dropped from the course?

Add Jdk 1.8 feature in depth

Are there topics that should be added to the course?

modify Practical list & If possible Allocate mini project to students.

Name of Faculty:

Ronak R Patel

Signature:

10/11/22

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Chandubhai S Patel Institute of Technology

Faculty of Technology and Engineering

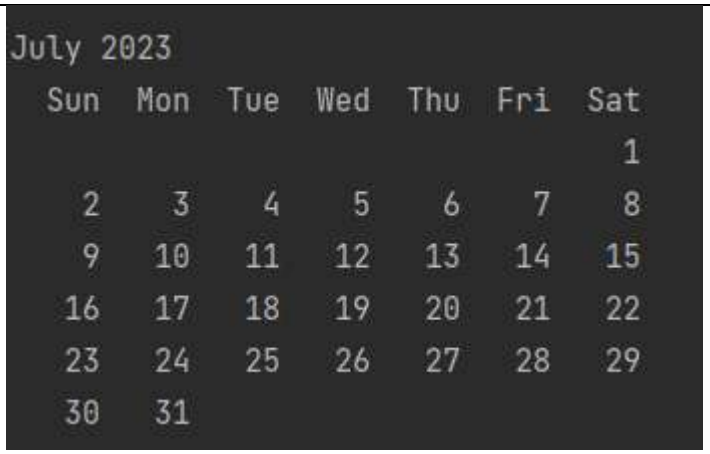
U & P U. Patel Department of Computer Engineering

Date: 28 / 06 / 2023

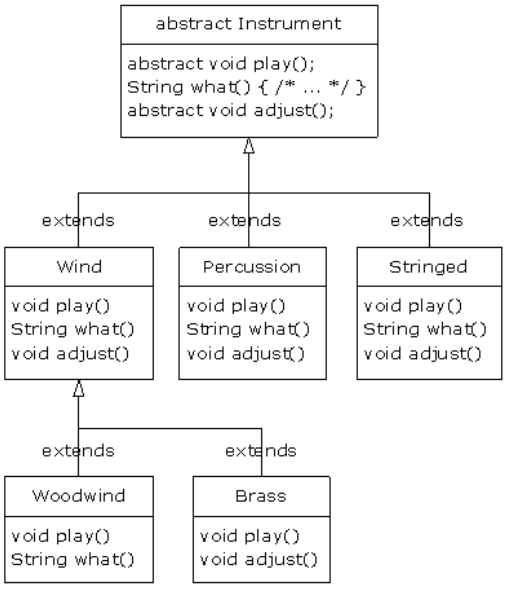
Practical List

Academic Year	:	2023-24	Semester	:	3
Course code	:	CE251	Course name	:	Java Programming

Sr.No	AIM	Hours	CO
	PART-I **Data Types, Variables, Arrays, Operators, Control Statements, String**		
1.	Introduction to Object Oriented Concepts, comparison of Java with other object oriented programming languages. Introduction to JDK, JRE, JVM, javadoc, command line argument.	2	1
2.	A typical mobile number in India is "+91-AA-BBB-CCCCC". Where the first two digits (AA)indicate a mobile system operator, the next three (BBB) denote the mobile switching code(MSC) while the remaining five digits (CCCCC) are unique to the subscriber. Write anapplication that takes a mobile number as an input from a user in above mentioned format and display code for mobile system operator, mobile switching code and last 5 digits which are unique to subscriber. Ex. For an input +91-94-999-65789, output should be :Mobile system operator code is 94 MSC is 999 Unique code is 65789	2	1
3.	Create a Java console application that displays a calendar of a given month and year. The program will take user input for the month and year they want to view the calendar and then create and display it. • Use an array to store the days in each month (including leap years), and a loop to output the calendar. • Use conditional statements to handle leap years and to align dates under the correct weekdays. **Input:** Enter the month (1-12): 7 Enter the year: 2023 **Output:**	2	1

			
4.	Java program that converts a string entered by the user to Morse code or vice versa. It will require the implementation of data structures, including arrays, loops, and conditional statements. • Create two arrays - one to contain the strings of letters to be converted, and one to contain the Morse codes. • In the program's main method, prompt the user for input to choose between the string or Morse. • For Morse code conversion, read in a string from the user; use conditional statements, looping, and array methods to convert the string to Morse-code. • For string conversion, read in a Morse-coded string from the user; use arrays, conditional statements, and looping to convert Morse code to a string. **Output:** Enter 1 for String to Morse code conversion Enter 2 for Morse code to String conversion Enter 3 To Exit 1 Enter a string: charusat Morse code: -.-. .... .- .-. ..- ... .- - Enter 1 for String to Morse code conversion Enter 2 for Morse code to String conversion Enter 3 To Exit 2 Enter Morse code: -.-. .... .- .-. ..- ... .- - String: CHARUSAT Enter 1 for String to Morse code conversion Enter 2 for Morse code to String conversion Enter 3 To Exit 3 Thank you for using Morse Code Converter!	2	1
5.	Let's create a program that generates and checks Anagrams. We could generate anagrams by taking in a string as input, rearranging the letters randomly, and presenting the resulting string to the user. Then we'll create another function that compares the user input to the original string to determine if the user input is an anagram of the original string. • Create a method that accepts a string and returns an array with all the possible permutations.	2	1

	• Use a random number to select a character to change position in the array to create a scrambled version of the string. • Present the resulting string to the user. • Accept user input and compare it to the original string to determine if it's an anagram. Return the result to the user.		
	PART-II **Object-Oriented Programming: Classes, Methods, Inheritance**		
1.	Design a class Microsoft Product consider below attributes and methods of the class. Attributes: – productNo : float – productName: String – activationKey : String – priceofProduct: float Methods: + getProductName() : String + getActivationkey() : String + getProductNo() : float + getPriceofProduct() : float + setActivationKey(acticationKey:String) : void + display() : void Store at least 5 different product data in object array and print data as per the search based on productName and productNo. Use Scanner class to take input from user end.	2	1,2
2.	Design a class named Account that contains: • A private int data field named id for the account (default 0). • A private double data field named balance for the account (default 500₹). • A private double data field named annualInterestRate that stores the current interest rate (default 7%). Assume all accounts have the same interest rate. • A private Date data field named dateCreated that stores the date when the account was created. • A no-arg constructor that creates a default account. • A constructor that creates an account with the specified id and initial balance. • The accessor and mutator methods for id, balance, and annualInterestRate. • The accessor method for dateCreated. • A method named getMonthlyInterestRate() that returns the monthly interest rate. • A method named getMonthlyInterest() that returns the monthly interest. • A method named withdraw that withdraws a specified amount from the account. • A method named deposit that deposits a specified amount to the account.	2	1,2
3.	Create a Java program the object class Point. An instance of a Point class depicts a point in two dimensional area where the smallest and biggest values for axis x and y are zero and 100 respectively. Coordinate values are integers. Class needs declarations to two private int type instance variables, one for each axis. Name the variables as you see fit. In addition to two instance variables, the class also requires a constructor and two instance methods according to the following descriptions. Constructor has two parameters, one for each axis. Values of these parameters are assigned to be the values of corresponding instance variables. Constructor must make sure that the coordinate value stays inside valid scope. If the value is lower than zero, value is zero and similarly if the value is higher than 100, value is to be 100. A toString() method is declared for the class. Method returns a character string where the coordinate values are enclosed with parenthesis separated with commas. (e.g. “(86,34)”). Value of the x coordinate is presented first. Another method declared for the class is move Method receives two parameters which	2	1,2

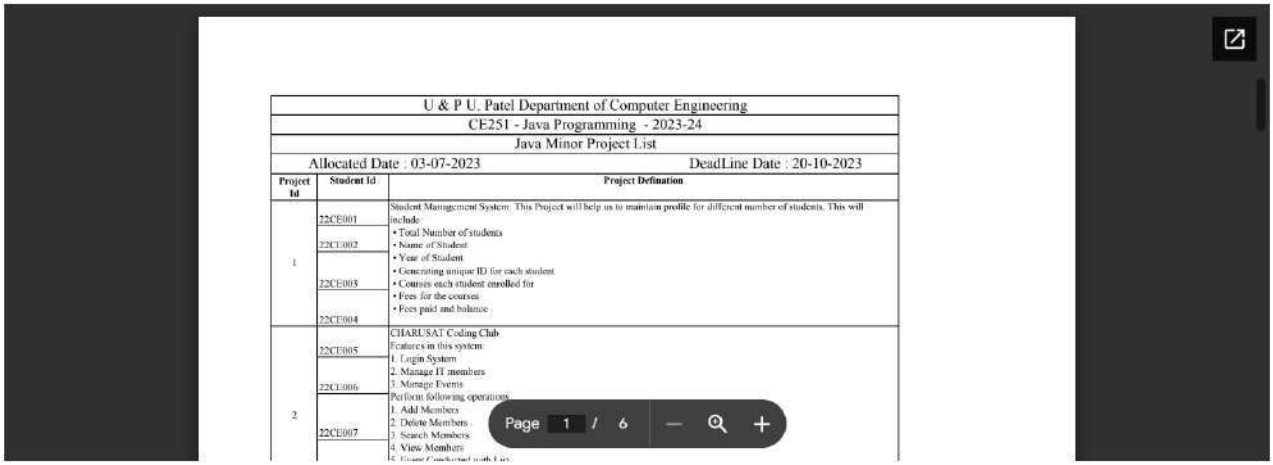
	are used to change the coordinate value. Parameters present the difference in the original coordinate value, not the new value directly. Method must make sure that neither of the coordinate values are smaller than zero nor higher than 100. If the change makes either of the values too low or too high, value is set to be zero or 100 respectively.Following are some examples of the method functionality: - if the old value of the coordinate is 12 and the difference is 34, new value is 46 - if the old value of the coordinate is 53 and the difference is -60, new value is 0 - if the old value of the coordinate is 63 and the difference is 82, new value is 100 Point class can be tested with PointTest class which has only the main method.		
3.	Create **GasMeter** class that keeps track of amount of refuelled gas. Class needs an instance method that receives the refuelled substance as parameter and the refuelled amount in litres. Class also needs four class methods which can print how much each substance has been used and the total amount of refuelled gas. Example output: what do you want: 1=95, 2=98, 3=Diesel (type any other number to quit): 1 How much do you want to refuel: 6,5 what do you want: 1=95, 2=98, 3=Diesel (type any other number to quit): 2 How much do you want to refuel: 5,5 what do you want: 1=95, 2=98, 3=Diesel (type any other number to quit): 0 Total used fuel: 12.0 Total used 95 octane fuel: 6.5 Total used 98 octane fuel: 5.5 Total used diesel fuel: 0.0	2	1,2
4.	Create a Java program to demonstrate the concept of method overloading using String. • Take the input as String through Scanner Class. • If String without having space, then the character 'A' replace by the 'Z' also displays length of the string. • If String has space, replace the second half of the string thought "CHARUSAT". • If String Length Is more than 10 with space, then convert String in lowercase.	2	1,2
	PART-III : Package & Interface		
1	Implement below UML diagram as per the given class name and method declared inside that. Play() method display which instrument called like "wind instrument played". what() method return instrument name. adjust() method display " instrument tuned properly". Called based on the lowest child to understand concept of method overriding also. Then separate call of the class is needed.  	2	1,2
2	Create a Recyclable Interface with the default method with the message "Give proper input". Create three different classes (Fabric, Bottel & Paper), which implement a	2	1,2

	Recyclable interface. Class requires toString methods which return the name of the recyclable materials. The toString method of the Fabric class returns the text "Febric" etc. **Expected output:** What do you want to recycle? Choose a number. 1 - Clothes 2 - Bottles 3 – Newspapers 4 – Exit Choose a Number: 2 Fabric recycled... Chose a number: 5 Give proper input Choose another number: 4 Thanks for coming...		
3.	Create program by writing two classes (Bottle and SodaBottle). Bottle class has one double type attribute: volume, which tells the volume of the bottle. This class also has one method: returnVolume, which returns the bottle volume. SodaBottle is derived from Bottle class and it implements the Recyclable interface class. SodaBottle also includes the name of the soda as attribute. A toString method is needed in SodaBottle class. toString returns the name of the soda and the volume of the bottle. Check example print for more precise printing needs. Recycle method should print the text "Bottle returned for recycling". Create object of SodaBottel Class only in main class. **Expected output** Type in the name of the soda: Pepsi Type in the volume of the bottle: 1 Pepsi, 1.0 litres Bottle returned for recycling.	2	1,2
4.	Create a package with class "Harmonic" have return type method to calculate harmonic series, call that class through main class and print the relevant output. Number should be take through Scanner class. **Equation of Harmonic Series** $\sum_{n=1}^{\infty} \frac{1}{n} = 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \cdots$	2	1,2
PART-IV : Exception Handling			
1	Write a Java Program which should ask for two integers and then add them together and print the result. Your task is to write the code which asks for the numbers and uses exception handling to check if the given numbers are integers. If the user inputs something else than an integer, "You did not type an integer!" is printed on screen. Program also includes the variable inputCorrect which value needs to be set to false if the given numbers are not integers.	2	4
2.	Write a java program with two classes (SmallException and BigException) and two methods to the ownException class (printErrorReport and testValue). SmallException and BigException are individual exception classes deriving from Exception class. Both classes require a constructor that receives a String object as parameter. Parameter is used to relay an informative message with the exception. Parameter is relayed to the superclass constructor. printErrorReport method receives the exception as a parameter and prints the error report of the exception using getMessage method. testValue method receives the tested number as a parameter. If the number is lower than five, method throws the SmallException and parameter is the message: Value is lower than 5. If the number is higher than 10, method throws the BigException and parameter is the message: Value is higher than 10.	2	4
PART-V : File Handling & Streams			

1.	Write a Java program which have readInfo method called in Person class. readInfo method is written to ClientsInFile class. The purpose of the program is to read the client information from clients.txt, make an object out of every client and finally print the information of every client on screen. Every client has their individual row in the file. File has every client's name and ID. Person class has one String type attribute where the information of the person (name and ID) is stored in. A toString method is required for Person class as well. toString returns the information of the person. readInfo method receives an array as parameter. This array will be used to store the created people. Method should create an object from each client in the file and store it in the array. Method returns the number of persons in the file. **Expected Output:** David 121279-2251 Matt 190970-1691 Homer 230369-2512 Joe 220755-1361	2	4
2.	Write a java program should read grades from grades.txt, increment grades by one, write the incremented grades to the file results.txt and finally print the incremented grades from grades.txt. If the grade is 10, it is not incremented. Each grade in grades.txt has an individual row and the number of grades may differ. Grades written to results.txt are also to be written to individual rows. Use BufferedReader class to read the grades.	2	4
3	Write a java program that uses java NIO File API to create the following directory structure as a sub directory in the current folder. |--Documents | --Work |--project1.txt |--project2.txt |--Personal |--weekendPlan.txt |--summerTrip.txt No need to add anything in the txt files	2	4
	PART-VI : Multithreading		
1.	Write a program to create thread which display "Hello World" message. A. by extending Thread class B. by using Runnable interface.	2	3
2.	Write a Java program to take the salary of five different employees in an array. Salary must be incremented by 5% through the thread. After every increment thread should be sleeping for around 2000 milliseconds.	2	3
3.	Write a Java program with three different Thread names "Dhoni", "Kohli", "Hardik". Give "Dhoni" the highest priority and "Hardik" the lowest priority and check the execution of the Thread from highest to lowest place every thread in the loop of 5 iterations. After every print, there is sleep of thread around 1000 millisecond. If the execution of the thread does not go in the given order then find the alternate way and create another program through join() method.	2	3
4.	Write a program to solve producer-consumer problem using thread Synchronization.	4	3
	PART-VII : Collection Framework and Generic		
1	Create a Java program that allows the user to manage their to-do list. The program will present the user with a menu of options to manage their to-do list, including adding new tasks, displaying a list of tasks, editing tasks, and deleting tasks from the list. We'll use an ArrayList for storing the tasks and implement methods for each of the menu options to give functionality to the program.	4	5,6
2.	Let's create a program that generates a randomly ordered deck of cards using Java. The program should create a deck of cards, shuffle the order of the cards, and then	4	5,6

	display the cards in random order to the user. We'll use ArrayList to store the deck of cards and methods such as shuffle() and random() to randomize the order of the cards. • Create a class called Card with fields suit and rank. • Create a class called Deck with an ArrayList object of Card type, called cards, and methods such as shuffle() and displayCards(). • Add 52 cards with 4 different suits, aces, numbers, and face cards. • Use the shuffle() method of the Collections class in Java to shuffle the deck of cards. • Finally, display the cards using the displayCards() method		
3.	Create a Java program that simulates a simple online bookstore. The program should allow the user to browse books, add books to their cart, and checkout. We'll use HashMaps to store the items and implement methods for browsing books, adding books to the cart, and checking out. This project will cover the concepts of HashMaps, loops, conditional statements, and methods in Java. • In the main method, create a HashMap of books, with each book mapped to a unique ID. • In another method, loop over the HashMap to print out the list of books. • Use the Scanner class to get user input to add a book to the cart. • Create an ArrayList to store the items in the cart. • Create a method for checking out and iterating over the cart item to calculate the total cost	4	5,6

Minor Projects (Submission Date : 20-10-2023)



U & P U. Patel Department of Computer Engineering

CE251 - Java Programming - 2023-24

Java Minor Project List

Allocated Date : 03-07-2023 DeadLine Date : 20-10-2023

Project Id	Student Id	Project Defination
1	22CE001 22CE002 22CE003 22CE004	Student Management System: This Project will help us to maintain profile for different number of students. This will include : • Total Number of students • Name of Student • Year of Student • Generating unique ID for each student • Coursis each student enrolled for • Fees for the courses • Fees paid and balance .
2	22CE005 22CE006 22CE007	CHARUSAT Coding Club Features in this system: 1. Login System 2. Manage IT members 3. Manage Events Perform following operations 1. Add Members 2. Delete Members . 3. Search Members. 4. View Members

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Annexure II

SST

CHARUSAT
CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

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Chandubhai S Patel Institute of Technology

Faculty of Technology and Engineering

U & P U. Patel Department of Computer Engineering

Date: 09-11-22

Academic Year	:	2022-23	Semester	:	V^th
Course code	:	CE354	Course name	:	operating system

Sr. No.	Criteria	Please tick (√) where applicable			
		Excellent	Good	Satisfactory	Needs Improvement
		4	3	2	1
1.	Course outcomes are well defined				✓
2.	Course content reflects industry perception / competitive exams	✓			
3.	Course content reflects research perception				
4.	Sufficient reading materials and digital resources provided		✓		
5.	Incorporation of advanced topics	✓			
6.	Assessment tools measure the course outcomes	✓			
7.	Pedagogy proposed has a desired balance between theory and practical	✓			
8.	Quality of micro/mini project component				✓
9.	Content of practical list				✓

Are there topics that should be dropped from the course?

course contents are very well made.

Are there topics that should be added to the course?

Nil.

Name of Faculty: Nishal Pasich

Signature: Pasich

↳ Atleast 5 shell scripts should be part of the practical list. So first 3 to 4 practicals based on the commands rest 4-5 for shell scripting. 1 practical for process management sys. call and 1 practical for cpu threads.

↳ scheduling, dynamic memory management, disk scheduling, IPC, Bankers algo, page replacement Algo, Detection Algo can be given as mini project. (Implementation)

Faculty of Technology and Engineering

U & P U. Patel Department of Computer Engineering

Date: 20 / 06 / 2023

Practical List

Academic Year	:	2023-24	Semester	:	5
Course code	:	CE354	Coursename	:	Operating System

Sr. No.	Aim	CO	No of Hours
1.	Installation of Operating System.	6	2
2.	Introduction to OS and shell. 1.Access the command Line 2.Manage files and directories from command line 3.Create, edit and and view text files **Commands for reference:** **Directory:** mkdir, rmdir, cd, pwd, ls, mv **Editor:** vi, gedit **File Handling/Text:** cp, mv, rm, sort, cat, file, less, more, cmp, diff, comm, head,tail, cut, grep, touch, tr, uniq **Self-Study:** **User Access:** login, logout, passwd, exit **Information:** man, who, date, cal, tty, calendar, time, bc, whoami, which,hostname, history, wc, finger, uname **Help:** man, help **Terminal:** echo, clear	1,5,6	4
3.	1.Manage local users, groups and creation of multiple users from excel sheet 2. Control access to files **Commands for reference:** **System Administrator:** su or root, adduser, rmuser, shut down **Control Access:** chmod	5, 6	2
4.	1. Managing and monitoring linux processes 2. Control Services and Daemons 3. Improve Command Line productivity **Commands for reference:** **Process:** top, ps, kill, pkill, w, lscpu **Control Services and Daemons: systemctl with parameters start,**	2,6	4

	stop, restart,enable disable, is-active, is-enabled and is-failed service **I/O Redirection** (<, >, >>), **Pipe** (	),		
5.	Study of Linux File System Commands for reference: **df, du, mount, unmount, locate, find**	2,5,6	2
6.	Write shell scripts for below given definitions: 1. Check whether the given file exists or not. 2. Check whether the argument passed from command line is file or directory. 3. List out all empty files in current working directory. Directory may contain subdirectories also. 4. Give two file names as command line arguments and check both the files are same or different. If they are same then delete the second file otherwise suggestwhat changes are required to make 1st file similar to second file. 5. Print multiplication table of given number 6. Shell script to check executable rights for all files in the current directory, if afile does not have the execute permission then make it executable. 7. Write a shell script for arithmetic calculator using command line arguments. 8. Write a script to print a given number in reversed order. 9. Write a script to convert string from lower to upper and upper to lower case 10. Shell script to Create a menu as shown below using the case statement 1)list of files 2)today's date 3)users of system 4)processes of user 5)display process information (CPU utilization) 6)display run-level 7)exit to prompt 11. Write a shell script to perform Memory allocation algorithms and calculate Internal and External Fragmentation. (First Fit, Best Fit, Worst Fit) Shell script video and task based on it: https://www.geeksforgeeks.org/introduction-linux-shell-shell-scripting/ 30 Bash Script Example: https://linuxhint.com/30_bash_script_examples/#top	6	6

7.	Process control system calls: A. The demonstration of fork () system call. 1. The fork system call will create processes in power of 2. 2. Write a program to take number of processes from the user and create those processes. B. Demonstration of execve () and wait () system calls along with zombie and orphan states.	2	2
8.	Implementation of Process Scheduling Algorithm: a. FCFS b. Round Robing c. SJF d. Priority Scheduling	2	4
9.	Find out the case where threads are helpful. A)With the help of posix API showcase the power of threads. Compare the Execution of single Process with threads execution. B) Perform Thread synchronization using counting semaphores and mutual exclusion using mutex	2	2
10.	Implement inter process communication (IPC) using PIPEs and FIFOs.	2,3	2
	Advanced Practical (For quick learners)		
11.	Tuning the system performance by setting tuning parameters and adjust scheduling priority of processes.		
12.	Control the Boot Process		
13.	Compile the module of Linux kernel		

Prepared by:

Sarita Thummar
Rikita Chokshi
Arpita Shah

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Annexure III

Date: 8/4/2023

Academic Year	: 2022-23	Semester	: 6th
Course code	: CE374	Course name	: Service Oriented Computing

Sr. No.	Criteria	Please tick (√) where applicable			
		Excellent	Good	Satisfactory	Needs Improvement
		4	3	2	1
1.	Course outcomes are well defined	✓			
2.	Course content reflects industry perception / competitive exams	✓			
3.	Course content reflects research perception		✓		
4.	Sufficient reading materials and digital resources provided	✓			
5.	Incorporation of advanced topics		✓		
6.	Assessment tools measure the course outcomes	✓			
7.	Pedagogy proposed has a desired balance between theory and practical	✓			
8.	Quality of micro/mini project component	✓			
9.	Content of practical list	✓			

Are there topics that should be dropped from the course?

Are there topics that should be added to the course?
Practical / mini task involving end to end activity of service creation, deployment and use in UI.

Name of Faculty: Dr HARSHADKUMAR PRAJAPATI **Signature:**

Annexure IX

CHARUSAT
CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

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Chandubhai S Patel Institute of Technology

Faculty of Technology and Engineering

U & P U. Patel Department of Computer Engineering

Date: 08/04/2023

Academic Year	:	2022-23	Semester	:	6th
Course code	:	CE374	Course name	:	Service Oriented Computing

Sr. No.	Criteria	Please tick (√) where applicable			
		Excellent	Good	Satisfactory	Needs Improvement
		4	3	2	1
1.	Course outcomes are well defined	✓			
2.	Course content reflects industry perception / competitive exams	✓			
3.	Course content reflects research perception		✓		
4.	Sufficient reading materials and digital resources provided	✓			
5.	Incorporation of advanced topics	✓			
6.	Assessment tools measure the course outcomes	✓			
7.	Pedagogy proposed has a desired balance between theory and practical	✓			
8.	Quality of micro/mini project component	✓			
9.	Content of practical list	✓			

Are there topics that should be dropped from the course?

WS Extension can be dropped from syllabus.

Are there topics that should be added to the course?

Message Brokers, Microservices, GraphQL can be added.

Name of Faculty: Mayuri Rahevar

Signature:

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Faculty of Technology and Engineering

U & P U. Patel Department of Computer Engineering

Date: 12/12/2022

Practical List

Academic Year	:	2022-23	Semester	:	6
Course code	:	CE374	Course name	:	Service-Oriented Architecture

S. No.	AIM	CO
1	Create XML file for Syllabus Booklet (Apply CSS) •Root Element University •University has Institute child element •Institute has Syllabus as child element •Syllabus contains subject-code, subject-name as child elements •Subject-name contains Unit-No name as child element •Unit-No contains topic-no, topic-name as child elements. •Draw Tree Structure for created XML File	02
2	Create DTD and XML for TVSchedule •Create element TVSCHEDULE contains multiple channel elements. •Element channel having attribute Banner and multiple Days as child elements. •Element Day contains DATE and HOLIDAY or PROGRAMSLOT as child element. •Element PROGRAMSLOT contains TIME, TITLE, DESCRIPTION as child elements. •TVSCHEDULE having attribute name as required. •TITLE having an optional attribute RATING and LANGUAGE. •Element Day having at least one HOLIDAY or PROGRAMSLOT elements. •PROGRAMSLOT must occur for at least once as child of Day element.	02

S. No.	AIM	CO
	• PROGRAMSLOT having zero or more occur of DESCRIPTION element	
3	a.) Apply extensible Stylesheet Language (XSLT) on practical 1 b.) Write XML Schema based on Practical:2	04
4	Create database CRUD REST API with docker	04
5	Create Publish/Subscribe Pattern using RabbitMQ Create Request/Reply Pattern using RabbitMQ	04
6	Build web services for database CRUD operation Java/PHP/Python and consume using any other scripting languages. Apply Graph QL Concept	08
7	Create Microservices in nodejs in user service, product service and order service	06

Annexure IV

CHARUSAT
CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

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Faculty of Technology and Engineering

U & P U. Patel Department of Computer Engineering

Date: 27/4/2023

Academic Year	:	2022-23	Semester	:	4th
Course code	:	CE245	Course name	:	~~CE~~ Data structures and Algo.

Sr. No.	Criteria	Please tick (√) where applicable			
		Excellent	Good	Satisfactory	Needs Improvement
		4	3	2	1
1.	Course outcomes are well defined		√		
2.	Course content reflects industry perception / competitive exams		√		
3.	Course content reflects research perception			√	
4.	Sufficient reading materials and digital resources provided	√			
5.	Incorporation of advanced topics		√		
6.	Assessment tools measure the course outcomes		√		
7.	Pedagogy proposed has a desired balance between theory and practical	√			
8.	Quality of micro/mini project component			√	
9.	Content of practical list	√			

Are there topics that should be dropped from the course?

NO

Are there topics that should be added to the course?

skip list and counting sort

Kindly share best practice adopted at your institute related to teaching- learning.

_Course era course, batch wise assignments, mini project.

Introduce various competetive platfoam in practicals

Name of Faculty: Nikita Bhatt **Signature:** Bhatt

CE261: DATA STRUCTURE & ALGORITHMS

Credits and Hours:

Teaching Scheme	Theory	Practical	Tutorial	Total	Credit
Hours/week	3	4	-	7	5
Marks	100	100	-	200	

Pre-requisite courses:

- Programming Language

Outline of the Course:

Sr. No.	Title of the unit	Minimum number of hours
1.	Introduction to Data Structure	04
2.	Linear Data Structure	12
3.	Non-Linear Data Structure	16
4.	Sorting	10
5.	Searching	01
6.	Dictionaries	02
	Total hours (Theory) :	45
	Total hours (Lab) :	30
	Total hours :	75

Detailed Syllabus:

1.	**Introduction**	**04 Hours**	**08%**
	Introduction to data structure (Types of data structure), Introduction to algorithms. Algorithm Analysis and Big O notation, Memory representation of Array: Row Order and Column Order, Abstract Data Types (ADT)		
2.	**Linear Data Structure**	**12 Hours**	**27%**
	Stack: Operations: push, pop, peep, change, Applications of Stack: Recursion: Recursive Function Tracing, Principles of recursion, Tail recursion, Removal of Recursion, Tower of		

	Hanoi, Conversion: Infix to Postfix, Infix to Prefix. Evaluation: Prefix and Postfix expression, **Queue** Simple Queue: Insert and Delete operation, Circular Queue: Insert and Delete operation, Concepts of: Priority Queue, Double-ended Queue, Applications of Queue, **Linked List:** Memory Representation of LL, Singly Linked List, Doubly Linked List, Circular Linked List, Applications of Linked List		
3.	**Non-Linear Data Structure**	**16 Hours**	**36%**
	Tree: Tree Concepts, Tree Traversal Techniques: Pre-order, Post-order and In-order (Recursive and Iterative), Binary Search Tree: Iterative and Recursive, Balanced Trees (AVL Trees, Applications of Tree, Skip list **Heaps**: Priority queues and Binary Heaps **Graph:** Graph concepts, Memory Representation of Graph, BFS and DFS, Applications of Graph		
4.	**Sorting**	**10 Hours**	**23%**
	Sorting (concepts, Selection Sort, Bubble Sort, Merge Sort, Radix Sort, Insertion Sort, Heap Sort, Quick Sort, Counting sort, Topological sort)		
5.	**Searching**	**01 Hours**	**02%**
	Sequential Search, Binary Search		
6.	**Dictionaries**	**02 Hours**	**04%**
	Hashing, Hashing Functions, Collision-Resolution Techniques, Applications		

Course Outcome (COs):

At the end of the course, the students will be able to

CO1	Understand and Implement Algorithms and core Data Structures such as stack, queue, hash table, priority queue, binary search tree and graph in programming language.
CO2	Analyse data structures in storage, retrieval and computation of ordered or unordered data.

CO3	Compare alternative implementations of data structures with respect to demand and performance.
CO4	Describe and evaluate the properties, operations, applications, strengths and weaknesses of different data structures.
CO5	Apply and select the most suitable data structures to solve programming challenges.
CO6	Discover advantages and disadvantages of specific algorithms.

Course Articulation Matrix:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	2	-	-	-	-	-	-	-	-	-	3	-
CO2	-	2	-	-	-	-	-	-	-	-	-	-	3	-
CO3	-	3	3	3	-	-	-	-	-	-	-	-	2	-
CO4	-	1	-	1	2	-	-	-	-	-	-	-	2	-
CO5	2	2	2	2	-	-	-	-	-	-	-	2	3	-
CO6	2	-	-	-	-	-	-	-	-	-	-	-	2	-

Enter correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put "-"

Recommended Study Material:

- **Text book:**
  1. An Introduction to Data Structures with Applications, Jean-Paul Tremblay, Paul G. Sorenson, McGraw-Hill.
  2. Data structure with C, Lipschutz, TMH
  3. Introduction to Algorithms: Cormen, Leiserson, Rivest and Stein: Prentice Hall of India
  4. Data Structures and Algorithms: Aho, Hopcroft and Ullmann: Addison Wesley.

- **Reference book:**
  1. Classic Data structures, D.Samanta, Prentice-Hall International.
  2. Data Structures using C & C++, Ten Baum, Prentice-Hall International.

3. Data Structures: A Pseudo-code approach with C, Gilberg & Forouzan, Thomson Learning.
4. Fundamentals of Data Structures in C++, Ellis Horowitz, Sartaj Sahni, Dinesh Mehta, W. H. Freeman.
5. “A Practical Introduction to Data Structures and Algorithm Analysis” by Clifford A. Shaffer
6. Data Structures and Algorithm in Java: Goodrich and Tamassia: John Wiley and Sons.

❖ **Web material:**

1. http://www.leda-tutorial.org/en/official/ch02s02s03.html
2. http://www.leda-tutorial.org/en/official/ch02s02s03.html
3. http://www.softpanorama.org/Algorithms/sorting.shtml

❖ **Software:**

1. Wireshark
2. Cisco Packet Tracer

- Coming Soon...
- Quiz / Online Course : 10 marks
  - Quiz Schedule:
    - Coming Soon...
- Assignment : 05 marks

Online Course

NPTEL: Programming, Data Structures And Algorithms Using Python By Prof. Madhavan Mukund

NPTEL: Data Structures and Algorithms using JAVA, By Prof. Debasis Samanta

University Papers

University Papers

Nikita Bhatt, Sarita Thummar, Vaishali Koria

Updated on : 19-June-2023

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Faculty of Technology and Engineering

U & P U. Patel Department of Computer Engineering

Date: 20/06/2023

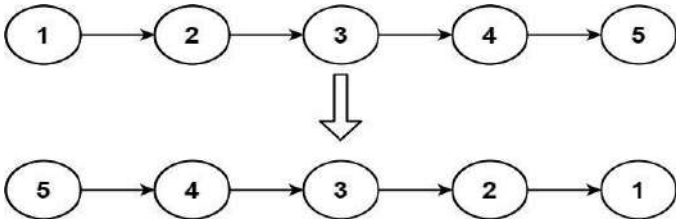
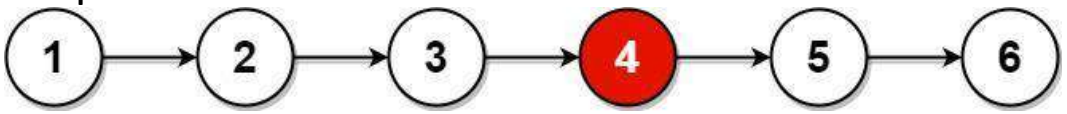
Practical List

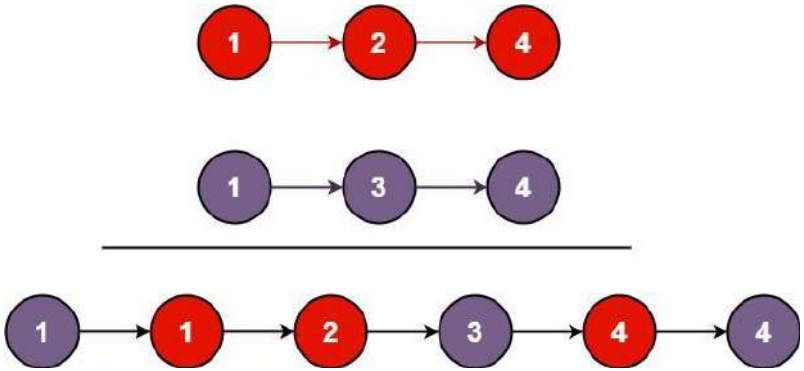
Academic Year	:	2023-24	Semester	:	3rd
Course code	:	CE261	Course name	:	Data Structures & Algorithms

Sr. No.	Aim	Hours	Platform
1	Installation of VS Code. Implement Linear Search and Binary Search using array data structure.	02	VS Code
2	In a far away Galaxy of Tilky Way, there was a planet Tarth where the sport of Competitive Coding was very popular. According to legends, there lived a setter known for loving knapsack type problems. Given N objects in a row, with weights W1,W2,…,WN, you need to find the maximum number of consecutive objects you can fill in a bag of maximum capacity C such that the total weight of objects taken is at least K. In other words, pick objects such that-The total weight of collected objects is at least K. The total weight does not exceed C. The objects picked must be consecutive (i.e. a subarray of the objects need to be picked) The number of objects is maximized. You need to print this maximum value.	02	VS Code

	Note: If no such object could be picked, then the answer is obviously 0. Input: • The first line of input contains T, number of test cases in a file. • The next line contains three integers, N, C and K, as described in the problem statement. • The next line contains N space separated integers, denoting Wi, i.e. weight of the object. Output: For test case, maximum number of objects you can pick. Input 2 5 5 5 5 4 3 2 1 5 5 4 1 4 1 1 1 Output 2 2		
3	Implement Sorting Algorithm(s). (a) Bubble Sort (b) Selection Sort (c) Insertion Sort	04	VS Code
4	Sort Colors: Given an array nums with n objects colored red, white, or blue, sort them in-place so that objects of the same color are adjacent, with the colors in the order red, white, and blue. We will use the integers 0, 1, and 2 to represent the color red, white, and blue, respectively. **Note: You must solve this problem without using the library's sort function.**	02	LeetCode Striver Video Link: https://www.youtube.com/watch?v=tp8JIuCXBaU
5	Chef and his little brother are playing with sticks. They have total N sticks. Length of i-th stick is Ai. Chef asks his brother to choose any four sticks and to make a rectangle with	02	VS Code

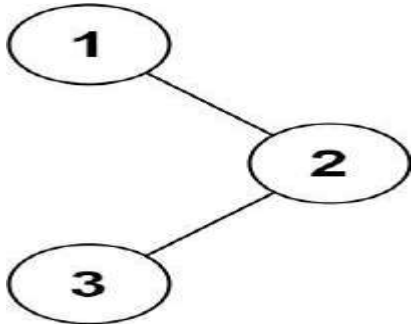
	those sticks its sides. Chef warns his brother to not to break any of the sticks, he has to use sticks as a whole. Also, he wants that the rectangle formed should have the maximum possible area among all the rectangles that Chef's brother can make. Chef's little brother takes this challenge up and overcomes it. Can you also do so? That is, you have to tell whether it is even possible to create a rectangle? If yes, then you have to tell the maximum possible area of rectangle. Input • The first line contains a single integer T denoting the number of test- cases. T test cases follow. • The first line of each test case contains a single integer N denoting the number of sticks. • The second line of each test case contains N space-separated integers A1, A2, ..., AN denoting the lengths of sticks. Output • For each test case, output a single line containing an integer representing the maximum possible area for rectangle or -1 if it's impossible to form any rectangle using the available sticks. Input 2 5 1 2 3 1 2 4 1 2 2 3		
6	Implement below operations of singly linked list. (a) Insert a node at front (b) Delete a node at last (c) Delete all nodes of linked list **Note: Display content of linked list after each operation.**	02	VS Code

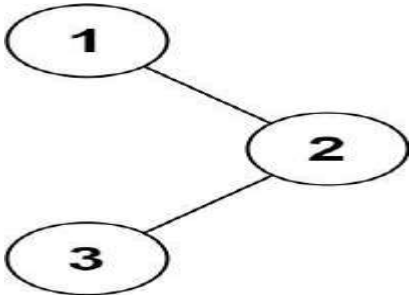
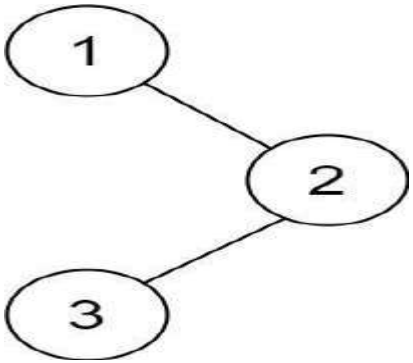
7	**Reverse Linked List** Given the head of a singly linked list, reverse the list, and return the reversed list. Input: head = [1,2,3,4,5] Output: [5,4,3,2,1]  	02	Leetcode Striver Video Link: https://www.youtube.com/watch?v=iRtLEoL-r-g
8	**Middle of the Linked List** Given the head of a singly linked list, return the middle node of the linked list. If there are two middle nodes, return the second middle node. **Example 1:**  Input: head = [1,2,3,4,5] Output: [3,4,5] Explanation: The middle node of the list is node 3. **Example 2:**  Input: head = [1,2,3,4,5,6] Output: [4,5,6] Explanation: Since the list has two middle nodes with values 3 and 4, we return the	02	Leetcode Striver Video Link https://www.youtube.com/watch?v=sGdwSH8RK-o

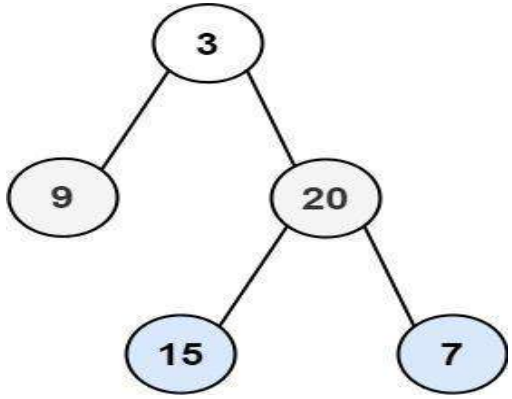
	second one.		
9	**Merge Two Sorted Lists** You are given the heads of two sorted linked lists list1 and list2. Merge the two lists in a one sorted list. The list should be made by splicing together the nodes of the first two lists. Return the head of the merged linked list. **Example 1:**  Input: list1 = [1,2,4], list2 = [1,3,4] Output: [1,1,2,3,4,4]	02	Leetcode Striver Video Link: https://www.google.com/search?q=Merge+Two+Sorted+Lists%0D%0A+%2B+striver&rlz=1C1CHBF_enIN1022IN1022&ei=Xa95ZPq6EKqJ4-EP0aiguAY&ved=0ahUKEwi63eOgnKT_AhWqxDgGHVEUCGcQ4dUDCA8&uact=5&oq=Merge+Two+Sorted+Lists%0D%0A+%2B+striver&gs_lcp=Cgxnd3Mtd2l6LXNlcnAQA0oECEEYAFAAWABgAGgAcAF4AIABAIgBAJIBAJgBAKABAqABAQ&sclient=gws-wiz-serp#fpstate=ive&vld=cid:5dc1bb9e,vid:Xb4slcp1U38
10	**Implement stack using array** Implement a program to implement a Stack using Array. Your task is to use the class as shown in the comments in the code editor and complete the functions push () and pop () to implement a stack. **Example 1**: Input: push(2) push(3) pop() push(4) pop()	02	VS Code Striver Video: https://www.youtube.com/watch?v=GYptUgnIM_I

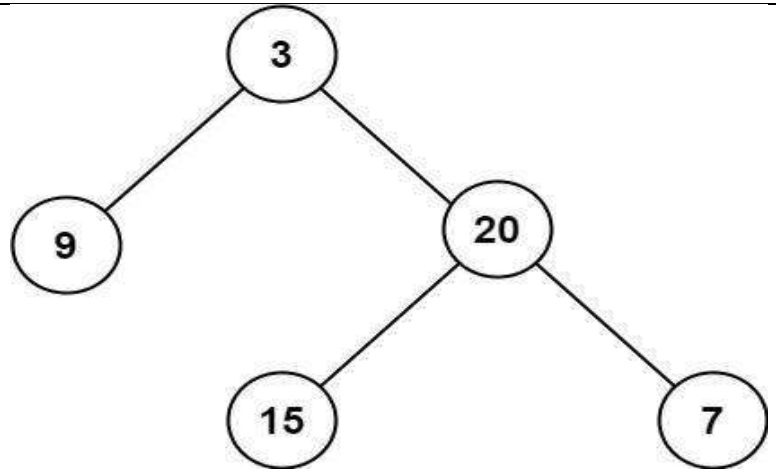
	Output: 3, 4		
11	**Implement Queue using array** Implement a Queue using an Array. Queries in the Queue are of the following type: (i) 1 x (a query of this type means pushing 'x' into the queue) (ii) 2 (a query of this type means to pop element from queue and print the poped element) **Example 1:** Input: Q = 5 Queries = 1 2 1 3 2 1 4 2 Output: 2 3	02	VS Code Striver Video: https://www.youtube.com/watch?v=M6GnoUDpqEE
12	**Implement Stack using Linked List** You have a linked list and you have to implement the functionalities push and pop of stack using this given linked list. Your task is to use the class as shown in the comments in the code editor and complete the functions push () and pop () to implement a stack. **Example 1**: **Input:** push(2) push(3) pop() push(4) pop() **Output: 3 4**	02	Geeksforgeeks Striver Video: https://takeuforward.org/data-structure/implement-stack-using-single-queue/
13	**Implement Queue using Linked List** A Query Q is of 2 Types (i) 1 x (a query of this type means pushing 'x' into the queue) (ii) 2 (a query of this type means to pop an element from the queue and print the popped element) **Example 1:**	02	Geeksforgeeks Striver Explanation: https://takeuforward.org/data-structure/implement-queue-using-linked-list/

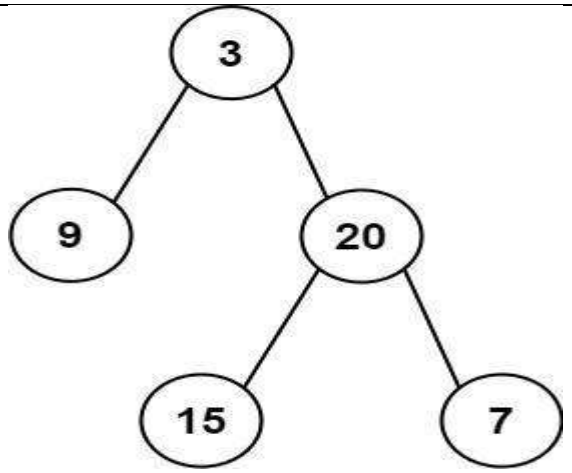
	Input: Q = 5 Queries = 1 2 1 3 2 1 4 2 Output: 2 3		
14	**Valid Parentheses** Given a string s containing just the characters '(', ')', '{', '}', '[' and ']', determine if the input string is valid. An input string is valid if: Open brackets must be closed by the same type of brackets. Open brackets must be closed in the correct order. Every close bracket has a corresponding open bracket of the same type. **Example 1:** **Input: s = "()"** **Output: true**	02	Leetcode Striver Explanation: https://www.youtube.com/watch?v=wkDfsKijrZ8
15	Chef has a sequence A1, A2, … … … AN and an integer K. Now there is a sliding window of size K which is moving from the very left of the array to the very right and at a particular time Chef has access to only those elements that are present in that window and Chef wants to find the number of the distinct elements of each window of size K. Help Chef to find the answer. Input The first line of the input contains a single integer T denoting the number of test cases. The description of T test cases follows. The first line of each test case contains two integers N and K. The second line contains N space-separated integers A1,A2,A3,…..A_N Output For each test case, print a single line containing space-separated integers — the number of the distinct elements of each window of size from the very left of the array to the very right of the sequence.	02	VS Code

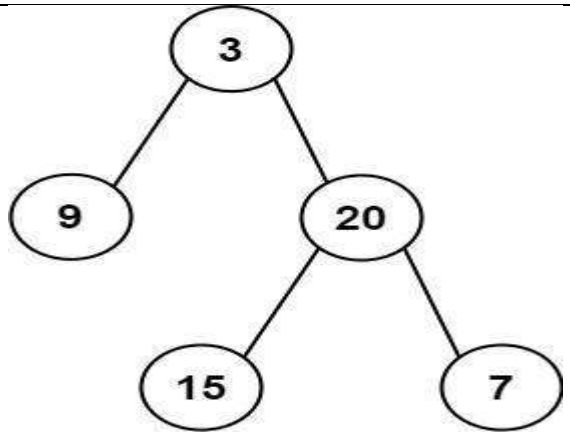
	Example Input 2 6 3 5 8 5 4 4 1 4 2 4 5 2 2 Output: 2 3 2 2 2 2 1 Explanation: Example case 1: Number of the distinct elements of [5, 8, 5], [8, 5, 4] [5, 4, 4], [4, 4, 1] are respectively 2, 3, 2, 2.		
16	**Binary Tree Inorder Traversal** Given the root of a binary tree, return the inorder traversal of its nodes' values. **Example 1:** 	02	Leetcode Striver Explanation: https://takeuforward.org/data-structure/inorder-traversal-of-binary-tree/

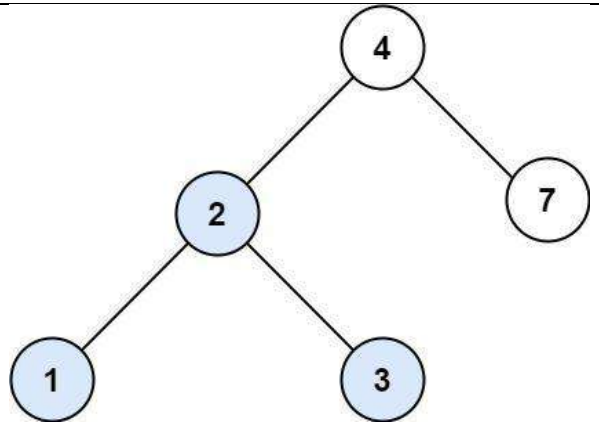
	Input: root = [1, null,2,3] Output: [1,3,2]		
17	**Binary Tree Preorder Traversal** Given the root of a binary tree, return the preorder traversal of its nodes' values. **Example 1:**  Input: root = [1, null,2,3]	02	Leetcode Striver Explanation: https://takeuforward.org/data-structure/preorder-traversal-of-binary-tree/
18	**Binary Tree Postorder Traversal** Given the root of a binary tree, return the postorder traversal of its nodes' values. **Example 1:**  Input: root = [1, null,2,3] Output: [3,2,1]	02	Leetcode Striver Explanation: https://takeuforward.org/data-structure/post-order-traversal-of-binary-tree/
19	**Binary Tree Level Order Traversal**	02	Leetcode

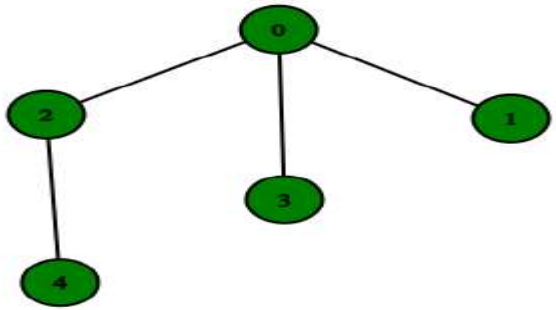
	Given the root of a binary tree, return the level order traversal of its nodes' values. (i.e., from left to right, level by level). **Example 1:**  Input: root = [3,9,20, null, null,15,7] Output: [[3],[9,20],[15,7]]		Striver Explanation: https://takeuforward.org/data-structure/level-order-traversal-of-a-binary-tree/
20	**Maximum Depth of Binary Tree** Given the root of a binary tree, return its maximum depth. A binary tree's maximum depth is the number of nodes along the longest path from the root node down to the farthest leaf node. **Example 1:**	02	Leetcode Striver Explanation: https://takeuforward.org/data-structure/maximum-depth-of-a-binary-tree/

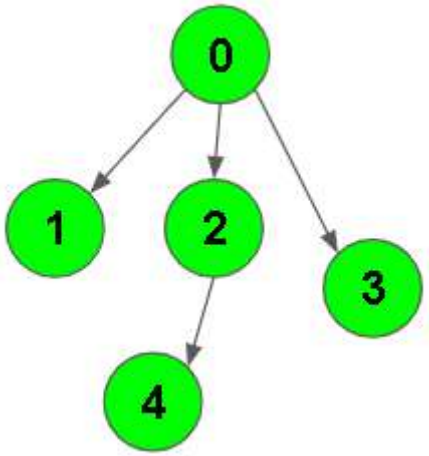
	 Input: root = [3,9,20, null, null,15,7] Output: 3		
21	**Construct Binary Tree from Preorder and Inorder Traversal** Given two integer arrays preorder and inorder where preorder is the preorder traversal of a binary tree and inorder is the inorder traversal of the same tree, construct and return the binary tree. **Example 1:**	02	Leetcode Striver Explanation: https://www.youtube.com/watch?v=aZNaLrVebKQ

	 Input: preorder = [3,9,20,15,7], inorder = [9,3,15,20,7] Output: [3,9,20,null,null,15,7]		
22	**Construct Binary Tree from Inorder and Postorder Traversal** Given two integer arrays inorder and postorder where inorder is the inorder traversal of a binary tree and postorder is the postorder traversal of the same tree, construct and return the binary tree. **Example 1:**	02	Leetcode Striver Explanation: https://www.youtube.com/watch?v=LgLRTaEMRVc

	 **Input:** inorder = [9,3,15,20,7], postorder = [9,15,7,20,3] **Output:** [3,9,20,null,null,15,7]		
23	**Search in a Binary Search Tree** You are given the root of a binary search tree (BST) and an integer val. Find the node in the BST that the node's value equals val and return the subtree rooted with that node. If such a node does not exist, return null. **Example 1:**	04	Leetcode Striver Explanation: https://www.youtube.com/watch?v=p7-9UvDQZ3w

	 Input: root = [4,2,7,1,3], val = 2 Output: [2,1,3]		
24	**DFS of Graph** You are given a connected undirected graph. Perform a Depth First Traversal of the graph. **Note:** Use a recursive approach to find the DFS traversal of the graph starting from the 0th vertex from left to right according to the graph. **Example 1:** **Input: V = 5 , adj = [[2,3,1] , [0], [0,4], [0], [2]]**	04	Geeksforgeeks Striver Explanation: https://www.youtube.com/watch?v=Qzf1a--rhp8

	 Output: 0 2 4 3 1 Explanation: 0 is connected to 2, 3, 1. 1 is connected to 0. 2 is connected to 0 and 4. 3 is connected to 0. 4 is connected to 2. so starting from 0, it will go to 2 then 4, and then 3 and 1. Thus dfs will be 0 2 4 3 1.		
25	**BFS of graph** Given a directed graph. The task is to do Breadth First Traversal of this graph starting from 0. **Note:** One can move from node u to node v only if there's an edge from u to v and find the BFS traversal of the graph starting from the 0th vertex, from left to right according to the graph. Also, you should only take nodes directly or indirectly connected from Node 0 in consideration.	04	Geeksforgeeks Striver Explanation: https://www.youtube.com/watch?v=UeE67iCK2lQ

	Example 1: **Input:**  Output: 0 1 2 3 4 Explanation: 0 is connected to 1 , 2 , 3. 2 is connected to 4. so starting from 0, it will go to 1 then 2 then 3.After this 2 to 4, thus bfs will be 0 1 2 3 4.		
26.	In an array of 20 elements, arrange 15 different values, which are generated randomly between 1,00,000 to 9,99,999. Use hash function to generate key using linear probing, quadratic probing and double hashing to avoid collision. H(*k*) = 2k + 3 and m = 20. Write a program to input and display the final values of array.	02	VS Code

Annexure V

CHARUSAT
CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

cspit
Chandubhai S Patel Institute of Technology

Faculty of Technology and Engineering

U & P U. Patel Department of Computer Engineering

Date: 23/11/2022

Academic Year	:	2022-23	Semester	:	5
Course code	:	CE355	Course name	:	Design & Analysis of Algo.

Sr. No.	Criteria	Please tick (√) where applicable			
		Excellent	Good	Satisfactory	Needs Improvement
		4	3	2	1
1.	Course outcomes are well defined		✓		
2.	Course content reflects industry perception / competitive exams		✓		
3.	Course content reflects research perception			✓	✓
4.	Sufficient reading materials and digital resources provided	✓			
5.	Incorporation of advanced topics				✓
6.	Assessment tools measure the course outcomes	✓			
7.	Pedagogy proposed has a desired balance between theory and practical		✓		
8.	Quality of micro/mini project component				not applicable
9.	Content of practical list		✓		

Are there topics that should be dropped from the course?

No

Are there topics that should be added to the course?

Huffman coding, optimal Merge pattern

Name of Faculty: Nikita Bhatt.

Signature: Bhatt

CE355: DESIGN & ANALYSIS OF ALGORITHMS

Credits and Hours:

Teaching Scheme	Theory	Practical	Tutorial	Total	Credit
Hours/week	4	2	-	6	**5**
Marks	100	50	-	150	

Pre-requisite courses:

- Data Structure and Algorithms
- Programming language

Outline of the Course:

Sr. No.	Title of the unit	Minimum number of hours
1.	Algorithm Analysis	10
2.	Greedy Algorithm	08
3.	Dynamic Programming	10
4.	Divide and Conquer Algorithm	07
5.	Exploring Graphs	10
6.	String Matching and Introduction to NP-Completeness	08
7.	Approximation Algorithms	07
	Total hours (Theory) :	**60**
	Total hours (Lab) :	30
	Total hours :	90

Detailed Syllabus:

1.	**Introduction**	**10 Hours**	**17%**
	Fundamentals of algorithms, Performance Analysis, Primitive Operations, Time Complexity and Space Complexity, The efficiency of algorithm, average and worst case analysis, elementary operation, Asymptotic Notation, Analysing control statement, Analysing Algorithm using Barometer, Solving		

	recurrence Equation, Sorting Algorithm: Selection, Insertion, Bubble Sort		
2.	**Greedy Algorithm**	**08 Hours**	**13%**
	Greedy: Characteristics, greedy functions, Problem solving: Making change problem, The Knapsack Problem, Dijkstra's Shortest paths; Job Scheduling Problem, Disjoint sets, Minimum Spanning trees (Kruskal's algorithm, Prim's algorithm, Huffman coding		
3.	**Dynamic Programming**	**10 Hours**	**17%**
	Dynamic Programming: The Principle of Optimality, Problem Solving: Calculating the Binomial Coefficient, Making Change Problem, Assembly Line-Scheduling Knapsack Problem, Shortest Path Matrix Chain Multiplication, Longest Common Subsequence, All Pairs Shortest Path (Floyd-Warshall), Travelling Salesman Problem, Bellman Ford Algorithm.		
4.	**Divide and Conquer Algorithm**	**07 Hours**	**12%**
	Multiplying large Integers Problem, Binary Search Sorting (Merge Sort, Quick Sort), Matrix Multiplication, Exponential		
5.	**Exploring Graphs**	**10 Hours**	**17%**
	An Introduction, Undirected Graph, Directed Graph, Breath First Search, Depth First Search, Graph coloring problem, Applications of BFS & DFS, Backtracking –The Knapsack Problem; The Eight Queens problem, Branch and Bound –The Assignment Problem, The Knapsack Problem		
6.	**String Matching and Introduction to NP-Completeness**	**08 Hours**	**13%**
	The naïve string-matching algorithm, The Rabin-Karp algorithm, KMP Algorithm for Pattern Searching, Boyer–Moore string-search algorithm**,** The class P and NP Problem, Polynomial reduction, NP-Completeness Problem, NP-Hard problems		
7.	**Approximation Algorithms**	**07 Hours**	**11%**
	Vertex Cover Problem, Travelling Salesman Problem, Set Covering Problem, Randomization and Linear Programming		

Course Outcome (COs):

At the end of the course, the students will be able to

CO1	Analyse the asymptotic performance of algorithms.
CO2	Derive time and space complexity of different sorting algorithms and compare them to choose application specific efficient algorithm.
CO3	Understand and analyse the problem to apply design technique from divide and conquer, dynamic programming, backtracking, branch and bound techniques and understand how the choice of algorithm design methods impact the performance of programs.
CO4	Understand and apply various graph algorithms for finding shorted path and minimum spanning tree.
CO5	Synthesize efficient algorithms in common engineering design situations.
CO6	Understand the notations of P, NP, NP-Complete and NP-Hard.

Sr. No	**Course Outcomes (Cos)**	**Employability/ Entrepreneurship/ Skill development**
1.	Analyse the asymptotic performance of algorithms.	Skill Development
2.	Derive time and space complexity of different sorting algorithms and compare them to choose application specific efficient algorithm.	Skill Development
3.	Understand and analyse the problem to apply design technique from divide and conquer, dynamic programming, backtracking, branch and bound techniques and understand how the choice of algorithm design methods impact the performance of programs.	Skill Development

4.	Understand and apply various graph algorithms for finding shorted path and minimum spanning tree.	Skill Development
5.	Synthesize efficient algorithms in common engineering design situations.	Employability
6.	Understand the notations of P, NP, NP-Complete and NP-Hard.	Skill Development

Course Articulation Matrix:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	-	-	-	-	-	-	-	-	-	-	1	-
CO2	2	2	-	-	-	-	-	-	-	-	-	2	2	-
CO3	3	3	3	3	2	-	-	-	-	-	-	2	2	-
CO4	2	3	3	1	-	-	-	-	-	-	-	-	2	-
CO5	1	-	1	-	-	-	-	-	-	-	-	2	1	1
CO6	3	1	-	-	-	-	-	-	-	-	-	-	1	-

Enter correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put "-"

Recommended Study Material:

- **Text books:**
  1. Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald Rivest and Clifford Stein, MIT Press

- **Reference books:**
  1. Fundamental of Algorithms by Gills Brassard, Paul Bratley, Pentice Hall of India.
  2. Fundamental of Computer Algorithms by Ellis Horowitz, Sartazsahni and

sanguthevar Rajasekarm, Computer Sci.P.

3. Design & Analysis of Algorithms by P H Dave & H B Dave, Pearson Education.

❖ **Web materials:**

1. http://highered.mcgraw-hill.com/sites/0073523402/

❖ **Software:**

1. Code::Blocks / Online C Editor

CHARUSAT

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

FEEDBACK ACTION TAKEN REPORT OF STAKEHOLDERS (2022-23)

CHARUSAT
CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
Accredited With "A" Grade by NAAC

Feedback Analysis
Academic Year: 2022-23
Action Taken

cspit
Chandubhai S Patel Institute of Technology

U. & P. U. Department of Computer Engineering

Feedback Received from various stakeholders

1. Action taken from Feedback received from employers.

#	Suggestion	Action Taken
1	Provide industrial exposure before projects to students	Offering summer internship in 4th and 6th semester summer vacation **Refer Annexure I**
2	Allow students to pick their favourite technology	Already have the choice to select technology and language as electives from 5th semester onwards – **Refer Annexure II**

2. Action plan and action taken from Feedback received from Alumni

#	Suggestion	Action Plan	Action Taken
1	Course should have more focus on GATE and assignment should also be designed for GATE preparation	It will be instructed to to faculties to cover GATE related questions at the end of each unit/course.	DSA, Computer Network, DAA, Maths, DE, OS, DLP, TOC courses includes GATE related questions.
2	Kindly make group at slack for all members.	Planning to have more clubs on campus.	Club chapters are already available from 2021-22. It can be viewed at http://sites.google.com/charusat.ac.in/cspitce/ **Refer Annexure III**
3	Solving more real time problems, tactical aspects and research	Students will be providing the opportunity to work on live projects with faculties.	Assignments are already aligned from 2021-22. Faculties and students are working on real time problems and live projects too. It can be viewed at http://sites.google.com/charusat.ac.in/cspitce/ **Refer Annexure IV**

3. Action plan and action taken from Feedback received from final year students

#	Suggestion	Action Plan	ActionTaken
1	Prepare students for Entrepreneurship starting from college First year and help them to gain knowledge about how they can start any company or business	Department will arrange sessions on Entrepreneurship	Seminars are arranged by EDC cell and Department for all the students from first year **Refer Annexure V.I** Student of 8th Sem got a purchase order of ~10 lakh to install RFID systems in 150 rooms. **Refer Annexure V.II**
2	Semester projects should follow an industry level development process	From 5th semester onwards, students will be guiding as per industry level development process	Aligned software engineering and SGP such that students have to undergo the all phases of software development **Refer Annexure VI.I** Received best pedagogy practice (1st Rank) award out of 28 Submissions. **Refer Annexure VI.II**
3	Provide them information on how they can find problems in the real world so it could help them to develop unique	Department will arrange competition and ideathon to find the problems	Already started competition in corporation hacker rank so that they can think and design on unique solutions. Practical list of DSA and DAA are designed in such a way that students get

	solutions for that problem		exposure of competitive programming on such platforms. **Refer Annexure VII.I** for report on Hacker Rank contest **Refer Annexure VII.II** for report on DBMS competition **Refer Annexure VII.III** - practical list of DSA and DAA

4. Action plan from Feedback received from Parents.

#	Suggestion	Action Plan	Action Taken
1	More practical demonstration in subject like MCO is required	Department will revise practical list of these subjects after checking the feasibility and requirement of industries.	Added more practical which requires demonstration in ICT and MCO **Refer Annexure VIII**

Annexure I

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

Date : 03/07/2023

CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY

BACHELOR OF TECHNOLOGY

Syllabus Details

Effective Year 2022-23

Program : BTECH(CE)
Semester : 5
Total Subjects : 7
Total Regular Subjects : 5
Total Elective Subjects : 2

Group Name : Regular

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	TOTAL
CE354	OPERATING SYSTEM	4.00	1.00		5.00	6.00	0/30	28/70	0/25	10/25	-	-	150
CE355	DESIGN & ANALYSIS OF ALGORITHMS	4.00	1.00		5.00	6.00	0/30	28/70	0/25	10/25	-	-	150
CE343	SOFTWARE ENGINEERING	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150
CE356	SOFTWARE GROUP PROJECT-III		2.00		2.00	4.00	-	-	0/50	20/50	-	-	100
CE346	SUMMER INTERNSHIP-I		3.00		3.00	3.00	-	-	0/75	30/75	-	-	150
					19.00	**24.00**							**700**

Group Name : HS Elective

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	TOTAL
HS131.02 A	COMMUNICATION AND SOFT SKILLS		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100

Group Name : Elective-I

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	TOTAL
CE371	ADVANCED JAVA PROGRAMMING (ELECTIVE-I)	2.00	2.00		4.00	6.00	0/30	28/70	0/50	20/50	-	-	200
CE373	MOBILE APPLICATION DEVELOPMENT (ELECTIVE-I)	2.00	2.00		4.00	6.00	0/30	28/70	0/50	20/50	-	-	200
CE377	ADVANCED WEB TECHNOLOGY (ELECTIVE-1)	2.00	2.00		4.00	6.00	0/30	28/70	0/50	20/50	-	-	200

Total Credit for Regular Subjects	:	19.00
Total Credit for Elective Subjects	:	6.00
Total Credit	:	25.00

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY Date : 03/07/2023

CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY

BACHELOR OF TECHNOLOGY

Syllabus Details

Effective Year 2022-23

Program : BTECH(CE) **Semester** : 5
Total Subjects : 7
Total Regular Subjects : 5
Total Elective Subjects : 2

Examination Grade Range & Value

Grade	Grade Points	From Marks	To Marks
AA	10.00	80	100
AB	9.00	73	79
BB	8.00	66	72
BC	7.00	60	65
CC	6.00	55	59
CD	5.00	50	54
DD	4.00	45	49
FF	0.00	0	44

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY Date : 03/07/2023

CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY

BACHELOR OF TECHNOLOGY

Syllabus Details

Effective Year 2022-23

Program : BTECH(CE) **Semester** : 7
Total Subjects : 7
Total Regular Subjects : 6
Total Elective Subjects : 1

Group Name : Regular

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	TOTAL
CE449	BIG DATA ANALYTICS	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150
CE442	DESIGN OF LANGUAGE PROCESSORS	4.00	1.00		5.00	6.00	0/30	28/70	0/25	10/25	-	-	150
CE443	CLOUD COMPUTING	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150
CE444	INTERNET OF THINGS	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150
CE450	SOFTWARE GROUP PROJECT-V		2.00		2.00	4.00	-	-	0/50	20/50	-	-	100
CE446	SUMMER INTERNSHIP-II		3.00		3.00	3.00	-	-	0/75	30/75	-	-	150
					22.00	**28.00**							**850**

Group Name : Elective-III

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	TOTAL
CE474	BLOCKCHAIN TECHNOLOGY (PROGRAMME ELECTIVE-III)	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150
CE475	WIRELESS COMMUNICATION & MOBILE COMPUTING (PROGRAMME ELECTIVE-III)	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150
CE476	MACHINE LEARNING (PROGRAMME ELECTIVE-III)	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150

Total Credit for Regular Subjects	:	22.00
Total Credit for Elective Subjects	:	4.00
Total Credit	:	26.00

Examination Grade Range & Value

Grade	Grade Points	From Marks	To Marks
AA	10.00	80	100
AB	9.00	73	79
BB	8.00	66	72
BC	7.00	60	65
CC	6.00	55	59
CD	5.00	50	54
DD	4.00	45	49
FF	0.00	0	44

Annexure II

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

Date : 03/07/2023

CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY

BACHELOR OF TECHNOLOGY

Syllabus Details

Effective Year 2022-23

Program : BTECH(CE)
Semester : 5
Total Subjects : 7
Total Regular Subjects : 5
Total Elective Subjects : 2

Group Name : Regular

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	TOTAL
CE354	OPERATING SYSTEM	4.00	1.00		5.00	6.00	0/30	28/70	0/25	10/25	-	-	150
CE355	DESIGN & ANALYSIS OF ALGORITHMS	4.00	1.00		5.00	6.00	0/30	28/70	0/25	10/25	-	-	150
CE343	SOFTWARE ENGINEERING	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150
CE356	SOFTWARE GROUP PROJECT-III		2.00		2.00	4.00	-	-	0/50	20/50	-	-	100
CE346	SUMMER INTERNSHIP-I		3.00		3.00	3.00	-	-	0/75	30/75	-	-	150
					19.00	**24.00**							**700**

Group Name : HS Elective

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	TOTAL
HS131.02 A	COMMUNICATION AND SOFT SKILLS		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100

Group Name : Elective-I

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	TOTAL
CE371	ADVANCED JAVA PROGRAMMING (ELECTIVE-I)	2.00	2.00		4.00	6.00	0/30	28/70	0/50	20/50	-	-	200
CE373	MOBILE APPLICATION DEVELOPMENT (ELECTIVE-I)	2.00	2.00		4.00	6.00	0/30	28/70	0/50	20/50	-	-	200
CE377	ADVANCED WEB TECHNOLOGY (ELECTIVE-1)	2.00	2.00		4.00	6.00	0/30	28/70	0/50	20/50	-	-	200

Total Credit for Regular Subjects	:	19.00
Total Credit for Elective Subjects	:	6.00
Total Credit	:	25.00

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY Date : 03/07/2023

CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY

BACHELOR OF TECHNOLOGY

Syllabus Details

Effective Year 2022-23

Program : BTECH(CE) **Semester** : 5
Total Subjects : 7
Total Regular Subjects : 5
Total Elective Subjects : 2

Examination Grade Range & Value

Grade	Grade Points	From Marks	To Marks
AA	10.00	80	100
AB	9.00	73	79
BB	8.00	66	72
BC	7.00	60	65
CC	6.00	55	59
CD	5.00	50	54
DD	4.00	45	49
FF	0.00	0	44

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

Date : 03/07/2023

CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY

BACHELOR OF TECHNOLOGY

Syllabus Details

Effective Year 2022-23

Program : BTECH(CE)
Semester : 6
Total Subjects : 7
Total Regular Subjects : 5
Total Elective Subjects : 2

Group Name : Regular

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	TOTAL
CE357	ARTIFICIAL INTELLIGENCE	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150
CE348	INFORMATION SECURITY	4.00	1.00		5.00	6.00	0/30	28/70	0/25	10/25	-	-	150
CE349	THEORY OF COMPUTATION	3.00			3.00	3.00	0/30	28/70	-	-	-	-	100
CE358	COMPUTER NETWORKS	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150
CE359	SOFTWARE GROUP PROJECT-IV		2.00		2.00	4.00	-	-	0/50	20/50	-	-	100
					18.00	**23.00**							**650**

Group Name : HS Elective

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	TOTAL
HS132.02 A	CONTRIBUTORY PERSONALITY DEVELOPMENT		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100

Group Name : Elective-II

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	TOTAL
CE374	SERVICE ORIENTED COMPUTING (PROGRAMME ELECTIVE-II)	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150
CE379	IMAGE PROCESSING & COMPUTER VISION (PROGRAMME ELECTIVE-II)	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150
CE378	DISTRIBUTED SYSTEMS (PROGRAMME ELECTIVE-II)	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150

Total Credit for Regular Subjects	:	18.00
Total Credit for Elective Subjects	:	6.00
Total Credit	:	24.00

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY Date : 03/07/2023

CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY

BACHELOR OF TECHNOLOGY

Syllabus Details

Effective Year 2022-23

Program : BTECH(CE) **Semester** : 6
Total Subjects : 7
Total Regular Subjects : 5
Total Elective Subjects : 2

Examination Grade Range & Value

Grade	Grade Points	From Marks	To Marks
AA	10.00	80	100
AB	9.00	73	79
BB	8.00	66	72
BC	7.00	60	65
CC	6.00	55	59
CD	5.00	50	54
DD	4.00	45	49
FF	0.00	0	44

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY Date : 03/07/2023

CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY

BACHELOR OF TECHNOLOGY

Syllabus Details

Effective Year 2022-23

Program : BTECH(CE) **Semester** : 7
Total Subjects : 7
Total Regular Subjects : 6
Total Elective Subjects : 1

Group Name : Regular

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		TOTAL
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	
CE449	BIG DATA ANALYTICS	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150
CE442	DESIGN OF LANGUAGE PROCESSORS	4.00	1.00		5.00	6.00	0/30	28/70	0/25	10/25	-	-	150
CE443	CLOUD COMPUTING	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150
CE444	INTERNET OF THINGS	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150
CE450	SOFTWARE GROUP PROJECT-V		2.00		2.00	4.00	-	-	0/50	20/50	-	-	100
CE446	SUMMER INTERNSHIP-II		3.00		3.00	3.00	-	-	0/75	30/75	-	-	150
					22.00	**28.00**							**850**

Group Name : Elective-III

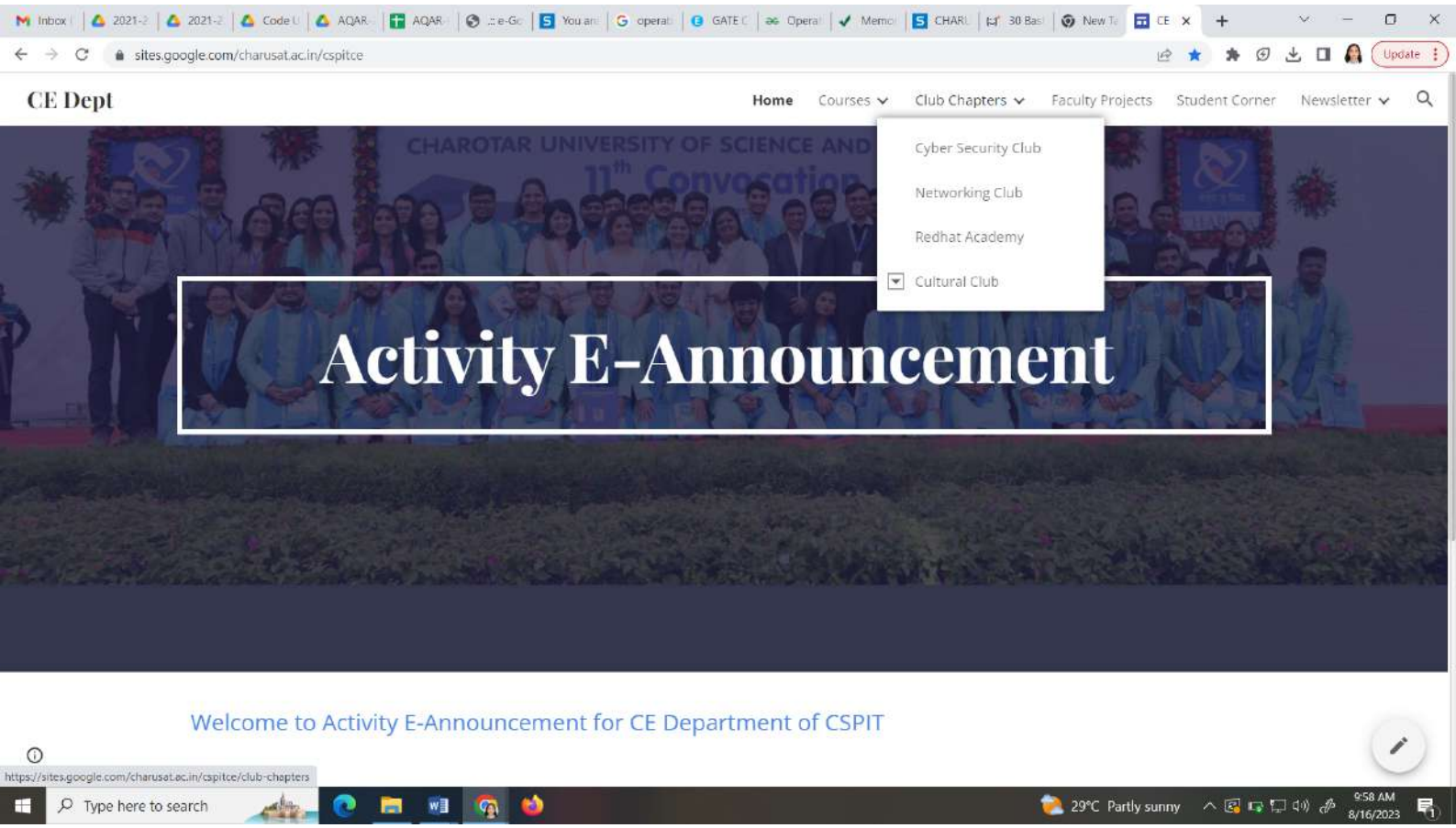
Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		TOTAL
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	
CE474	BLOCKCHAIN TECHNOLOGY (PROGRAMME ELECTIVE-III)	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150
CE475	WIRELESS COMMUNICATION & MOBILE COMPUTING (PROGRAMME ELECTIVE-III)	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150
CE476	MACHINE LEARNING (PROGRAMME ELECTIVE-III)	3.00	1.00		4.00	5.00	0/30	28/70	0/25	10/25	-	-	150

Total Credit for Regular Subjects	:	22.00
Total Credit for Elective Subjects	:	4.00
Total Credit	:	26.00

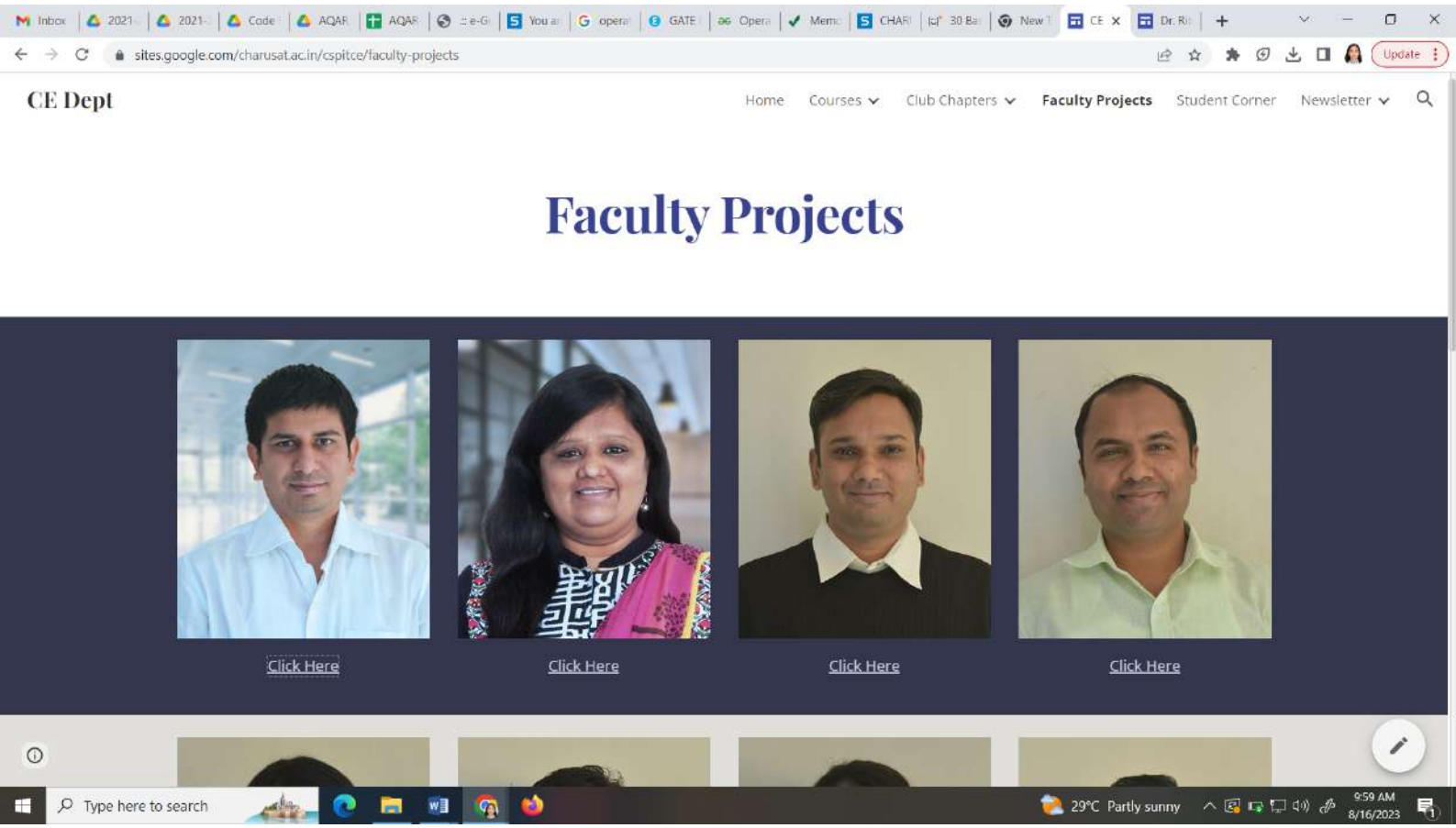
Examination Grade Range & Value

Grade	Grade Points	From Marks	To Marks
AA	10.00	80	100
AB	9.00	73	79
BB	8.00	66	72
BC	7.00	60	65
CC	6.00	55	59
CD	5.00	50	54
DD	4.00	45	49
FF	0.00	0	44

Annexure III



Annexure IV


sites.google.com/charusat.ac.in/cspitce/faculty-projects
CE Dept
Home
Courses
Club Chapters
Faculty Projects
Student Corner
Newsletter
Faculty Projects
Click Here
Click Here
Click Here
Click Here
Type here to search
29°C Partly sunny
9:59 AM
8/16/2023

Project Name: **Real-Time & Historical World Weather Data API** [Open]

Project Name: **Obtaining experimental real time weather forecast** [Open]

Project Name: **Investigation ISMR-Global SST Teleconnections** [Open]

ZAP Attendance System Implementation at CHARUSAT [**Ongoing**]

FACULTY OF TECHNOLOGY AND ENGINEERING

CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY

U & PU PATEL DEPARTMENT OF COMPUTER ENGINEERING

Event Summary Report

Date : 22-Mar-2022

Event Information :

Event Application ID	2021-22/00478
Event Title	Seminar on Entrepreneurship as career – most aspired 21st century skill
Event Organized as part of	Career Development and Placement Activity
Event Type	Seminars
Event Period	28-Feb-2022 To 28-Feb-2022

Participants Details :

Sr. No.	Participant Type	No of Participants
1	CHARUSAT Students	141
	Total	141

Event Co-Ordinators Details :

Sr. No	Employee Code	Employee Name	Employee Role
1	8347	DEEPKUMAR RAMESHBHAI KOTHADIYA	Co-coordinator
2	58	RITESH PRAVINBHAI PATEL	Convener
3	544	CHINTAN MAHESHKUMAR BHATT	Coordinator
4	833	MAYURI JAMANADAS POPAT	Co-coordinator

HoD/HoI Signature

CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY • CHARUSAT-CAMPUS CHANGA

CHARUSAT
CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

cspit
Charotar S Patel Institute of Technology

Faculty of Technology and Engineering

U & P U. Patel Department of Computer Engineering

Date: 11/03/2022

Event Application No in E-governance: 2021-22/00478

Event Name: Entrepreneurship as career – most aspired 21st century skill

Detail about the event:

U & P U. Patel Department of CE, CSPIT organized the event regarding **"Entrepreneurship as career – most aspired 21st century skill"** to help students understand about EDIC (Entrepreneurship Development and Incubation center). Dr Pranav Desai gave insights to students about all the activities of EDIC and how students can benefit from it. Total **141** students from CSPIT CE registered for the event and gain advantage of it. The event was organized in offline mode at Charusat A6 Building , 3rd floor Seminar hall. Faculty member Dr Ritesh Patel, Dr Chintan Bhatt, Mr. Deep kothadiya and Ms. Mayuri Popat from CE, CSPIT were part of Organizing this activity.

All participants were happy and felt they have got right direction to move forward in the journey of life.

Schedule of Event:

Session No.	Session Date	Time	Expert name	Title
1	28/02/2022	10:30 to 12:00 PM	Dr. Pranav Desai	Entrepreneurship as career – most aspired 21st century skill

Session No. 1:
Resource person: Dr. Pranav Desai
Topic: Entrepreneurship as career – most aspired 21st century skill.
Outcome of event: Dr Pranav Desai, an expert, addressed participants regarding various activities of EDIC, Routes towards Entrepreneurship and how to see opportunity in every problem that we read from Newspaper.

Actionable insights of Event:

- Activities under EDIC
- Routes towards Entrepreneurship
- See opportunity in every problem

Attach applicable Annexure:

1. Attach CV of experts as per Session no.
2. Press Release (Not Applicable)
3. Certificate Sample (Not Applicable)
4. Winner List (Not applicable)

CV of experts

1. Dr. Pranav Desai

Dr. Pranav Desai is working as an Senior Faculty Member at Indukaka Ipcowala Institute of Management, Faculty of Management Studies, Charotar University of Science and Technology (CHARUSAT), Changa – Gujarat -India.

He completed his Ph D from Dharmsinh Desai University, Nadiad in 2016. His basic qualification is a kind of rare combination of IT and Management as he did his graduation in Computer Applications and MBA (Marketing & Finance).

He possesses teaching experience exceeding **15** years in various departments / institutes of CHARUSAT. His experience covers teaching in the areas of Entrepreneurship Development / Innovation Management, Marketing Management, Information Technology Management / Computer Applications in Various disciplines like Management, Engineering and Pharmacy. He has coordinated / delivered around **36** various courses to more than **63** batches of various programmes of the continent institutes of the Universities. He has been an active member of an Integrated Promotional Approach for Admissions at CHARUSAT since 2007. He has also contributed his efforts for developing a University Brand and as a part of the same, being a frontline runner, he has provided his counselling services to more than **8.5** lakh students / parents across the state of Gujarat.

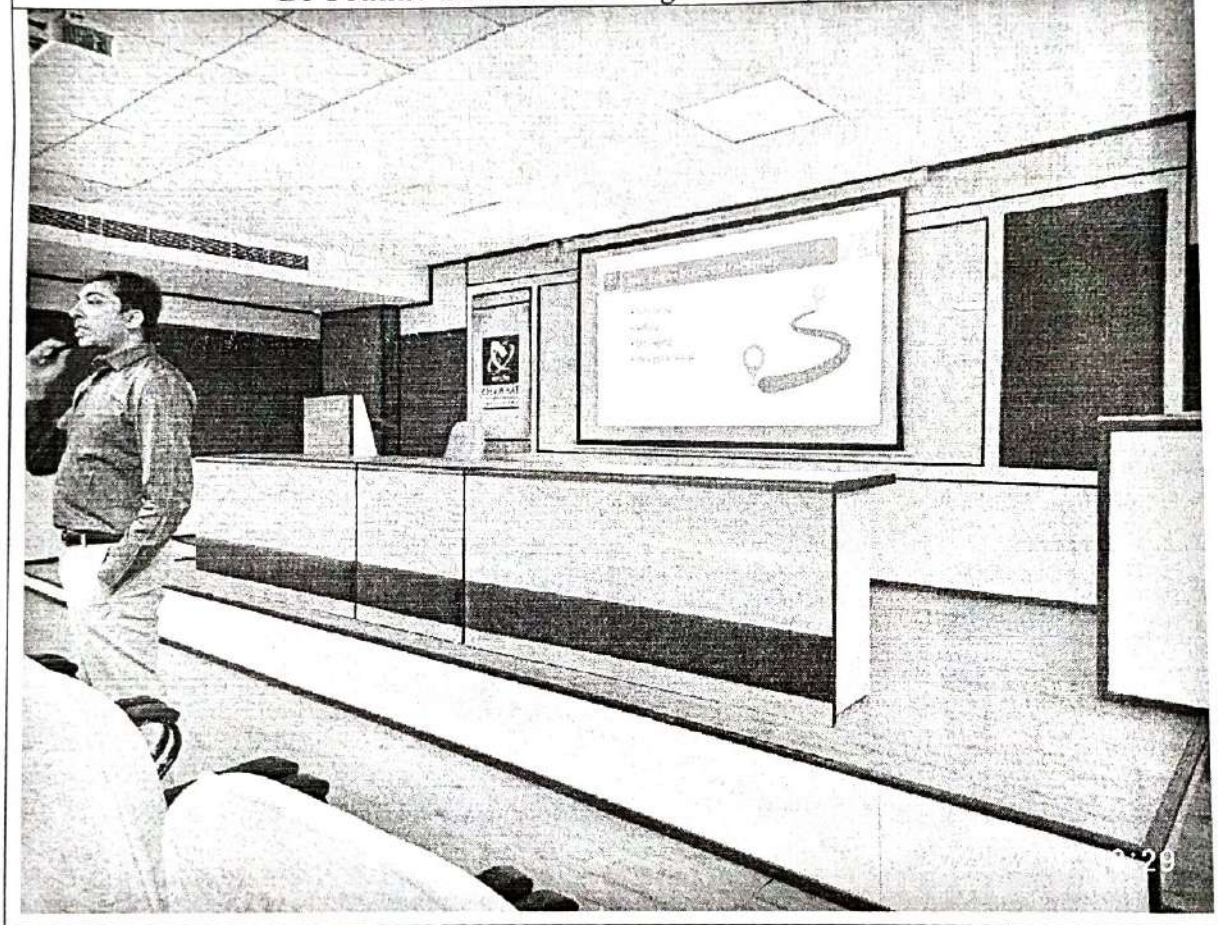
His love towards training and mentoring for Entrepreneurship has always encouraging students of CHRAUSAT and surrounding institutions by promoting the starts ups at Entrepreneurship Development and Incubation Cell (EDIC) at CHARUSAT, wherein he had been an active role in establishment of a Tinkering and Fabrication Laboratories. He is certified Incubation Manager by IC^2 Institute the University of Texas at Austin, funded by the US Department of State.

He has authored a book titled "Multi-sector Product Recall Strategies" published from Germany. He is a highly motivated scholar working in the area of Marketing, Risk Management; IT Management and Entrepreneurship. He also has to his credit **28** research and concept papers published in national / International journals and chapters in books. Importantly, during his career as an Assistant Professor, he has guided **197** UG and **161** PG students for their research projects. Further, he has presented **56** academic and research papers at reputed institutes like IIM Bangalore, MICA and has undergone training during FDPs at premier institutes like IIM-Kozhikode and Entrepreneurship Development Institute of India (EDII), Gandhinagar.

He aims to work upon the projects that contribute to society and promotes cross-disciplinary thinking and research in the fields of Marketing and Entrepreneurship.

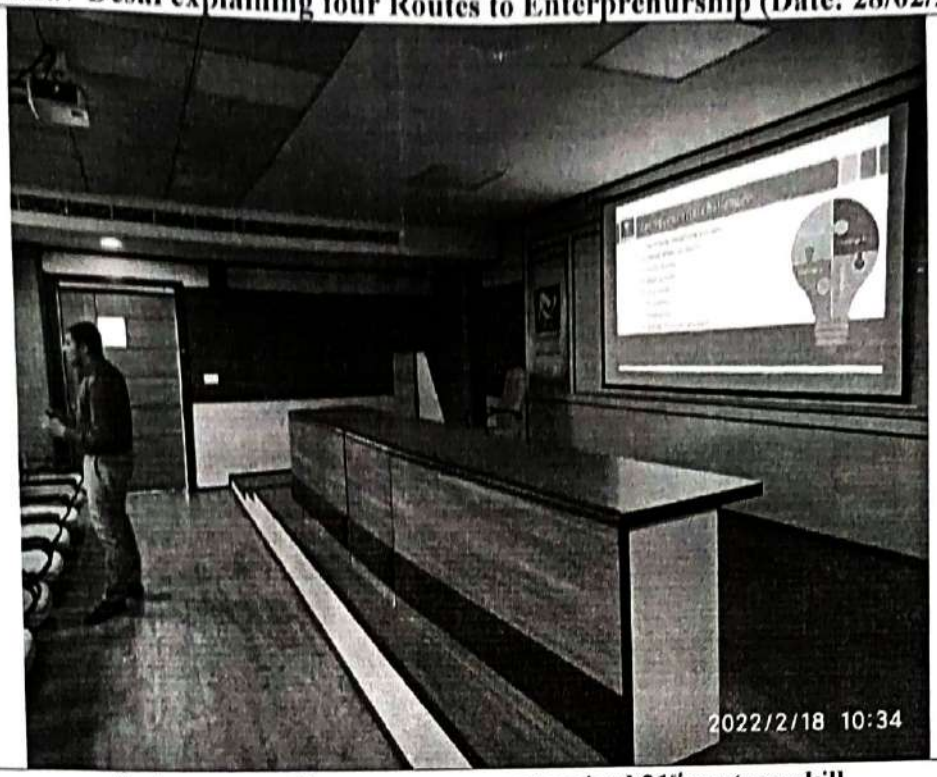
Photographs with Caption

Entrepreneurship as career – most aspired 21st century skill
Dr Pranav Desai Delivering his talk (Date: 28/02/2022)



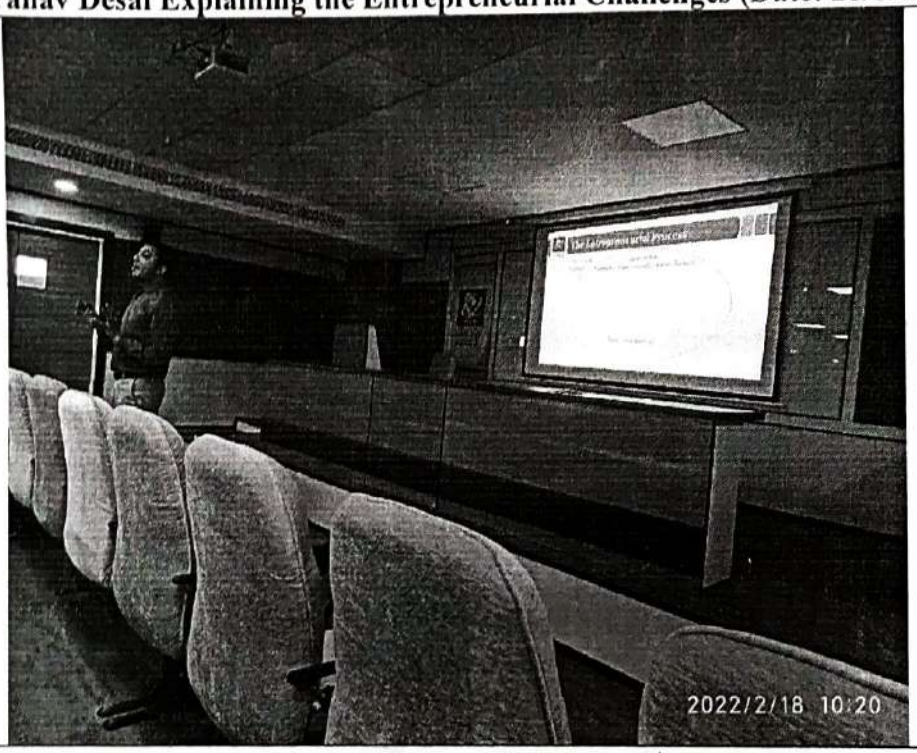
Entrepreneurship as career – most aspired 21st century skill

Dr. Pranav Desai explaining four Routes to Enterprenurship (Date: 28/02/2022)



Entrepreneurship as career – most aspired 21st century skill

Dr. Pranav Desai Explaining the Entrepreneurial Challenges (Date: 28/02/2022)



Entrepreneurship as career – most aspired 21st century skill

Dr. Pranav Desai Explaining the Entrepreneurial Process (Date: 28/02/2022)

HoD/HoI Sign :

CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY • CHANGA

CHARUSAT
CSPIT
U & P U. Patel Department of Computer Engineering

U & P U Patel Department of Computer Engineering

Name of Event	Seminar on Entrepreneurship as Career - Most Aspired 21st Century Skill
Date of Event	18/02/2022
Organizing Authority	CSPIT-CE

Student List

Sr. No	Student ID	Name	Sign
1	20CE034	Gundalia Dev M	
2	20CE025	Harshil Dholakia	
3	20CE150	Medha Tiwari	
4	20CE146	Kavya Thaker	
5	20CE140	Dhwani Suthar	
6	D21CE165	Brijesh Ghadiya	
7	20CE017	Parth Darji	
8	20CE024	Bhavdeep Dhaduk	
9	20CE031	Ritu Godhasara	
10	20CE129	Kalpit Shah	
11	20CE012	Srishu Chintakindi	
12	D21CE161	Parth Goswami	
13	20CE083	Hit Patel	
14	20ce011	Devanshi Chhabhaiya	
15	20ce023	Kaviraj Desai	
16	20CE078	Akshar Patel	
17	20CE106	Tisha Patel	
18	20CE114	Yagnik Poshiya	
19	20CE027	Vatsal Doshi	
20	20CE145	Dhruv Teraiya	
21	20CE148	Ish Thumber	
22	20CE038	Shyamal Joshi	
23	20CE018	Bhargavi Dave	
24	20CE010	Madhav Chaudhari	
25	20CE044	Padmanabh Khunt	
26	20CE102	Sanjana Patel	
27	20CE005	Yash Bhalgamiya	
28	D21CE170	Harsh Shah	

CHARUSAT
CSPIT
U & P U. Patel Department of Computer Engineering

Chandubhai S Patel Institute of Technology

29	20CE137	Darshil Shukla	
30	20CE095	Patel Nirmi Bipinkumar	
31	20CE075	Parth Parmar	
32	20ce136	Harvi Sheth	
33	20CE090	Maitrey Patel	
34	20CE088	Keya Patel	
35	20CE072	Nirava Parikh	
36	20CE098	Pranay Patel	
37	20ce077	Aditya Patel	
38	20CE037	Rip Jakharia	
39	20ce082	Harsh Patel	
40	20CE009	Yash Bhuva	
41	D21CE169	Krutik Jain	
42	20CE016	Krutik Dadhaniya	
43	20ce076	Patel_Aditya_Pinakinbhai	
44	20CE122	Keyur Sanghani	
45	20CE119	Dipkumar Rupapara	
46	20Ce126	Hardi Shah	
47	20CE015	Ayush Dabhi	
48	20CE133	Prachi Shah	
49	20CE130	Krima J Shah	
50	20ce135	Virti Shah	
51	20CE003	Raj Beladiya	
52	20CE021	Jiya Desai	
53	20CE019	Samarth Dave	
54	20ce118	Khushi Ranpariya	
55	20CE001	Bhargav Bakrania	
56	20ce113	Het Pathak	
57	20CE020	Aksh Desai	
58	d21ce176	Om Kalariya	
59	D21CE174	Darshan Zapda	
60	20CE085	Jay Patel	
61	20CE064	Harshil Padasala	
62	20CE139	Om Sutariya	
63	20CE151	Akash Trivedi	
64	20ce134	Shail Shah	
65	D21CE178	Nisarg Shah	
66	20CE125	Dhruv Shah	
67	20CE116	Mayan Prajapati	
68	20ce153	Shruti Unadkat	
69	20ce071	Dhairya Pandya	
70	20CE081	Patel Gaurang	

CHARUSAT
CSPIT
U & P U. Patel Department of Computer Engineering

Chandubhai S Patel Institute of Technology

71	20CE111	Vraj Patel	
72	20ce099	Pushti Patel	
73	20ce100	Rishi Patel	
74	20CE147	Rohitkumar Thakkar	
75	20CE029	Misari Gami	
76	20ce092	Patel Meshv U	
77	20CE074	Parmar Harshilkumar	
78	20CE026	Parth Dobaria	
79	20CE032	Dakshraj Gohil	
80	20CE073	Divyesh Parmar	
81	20ce156	Dhruvi Vaishnav	
82	20ce093	Neel Patel	
83	PATEL	Poojan	
84	20CE030	Ankit Ganatra	
85	20ce097	Prachiben Patel	
86	20CE045	Yashvi Kotadiya	
87	20CE142	Khushi Tala	
88	20CE124	Sagar Senjaliya	
89	20CE138	Hetvi Soni	
90	20CE087	Kautik Patel	
91	20CE157	Archana Vyas	
92	20ce152	Ravikumar Uchadadiya	
93	20ce128	Jay Shah	
94	20ce051	Kirtan Mangukiya	
95	20CE059	Dev Nakum	
96	D21CE167	Manan Kathrecha	
97	20CE063	Preet Padariya	
98	20CE105	Sumankumar Patel	
99	20CE056	Pratham Modi	
100	20CE036	Khushi Jaiswal	
101	20CE066	Hetvi Panara	
102	20CE046	Sakina Kuterwadli	
103	D21CE173	Apurva Bhatt	
104	20CE033	Suryadeepsinh Gohil	
105	20ce080	Diya Patel	
106	20CE107	Tushar Patel	
107	20CE053	Smit Mataliya	
108	20CE068	Jay Panchal	
109	20ce110	Vishwa Patel	
110	20ce062	Ranjit Odedra	
111	20CE115	Divya Prajapati	
112	20CE086	Kashyap Patel	

CHARUSAT
CSPIT
U & P U. Patel Department of Computer Engineering

Chandubhai S Patel Institute of Technology

113	20ce094	Nehal Patel	
114	20CE149	Ketan Tiwari	
115	20CE141	Pratik Suthar	
116	20CE112	Yash Patel	
117	20CE158	Pratham Patel	
118	20CE035	Hiten Jadav	
119	20CE047	Brijesh Ladva	
120	20CE069	Pratikkumar Panchal	
121	20CE143	Dhruvin Tandel	
122	20CE061	Devansh Nirmal	
123	20CE065	Shruti Paghadal	
124	20ce109	Vansh Patel	
125	20CE101	Sahil Patel	
126	20CE028	Harsh Dubey	
127	20CE123	Shubham Sareliya	
128	20CE041	Himani Kapadia	
129	20CE043	Hena Kharwa	
130	20CE048	Maharshi Limbachiya	
131	20CE132	Nisarg Shah	
132	20CE131	Krupa Shah	
133	20CE060	Yash Narodia	
134	20CE144	Neelkanth Tandel	
135	20CE049	Priya Makadia	
136	20CE104	Siya Patel	
137	20CE079	Bhavya Patel	
138	20CE108	Uday Patel	
139	20CE117	Dhruv Digvijaysinh Puvar	
140	20ce002	Nidhi Batra	
141	20ce154	Vismay Vachhani	

HOD-CE

Annexure V.II

CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY

Formed under Gujarat State Act No. : 8 of 2009
Accredited Grade A by NAAC

PO. No. CHA/KRC/2023/02 March 28, 2023

To,
Team Elementals LLP
Saurashtra University Road,
Rajkot-Gujarat 360005.

Subject: Purchase Order for **"RFID Based Attendance System / Foot Print / In-out"** (Phase – II CSPIT, DEPSTAR & IIIM Class Rooms and Computer Labs etc.).

Ref.: As per your quotation TESQ-2022-23-00077

Dear Sir,

With reference to your quotation mentioned above, we are pleased to place a purchase order for the Equipment as per the technical specifications mentioned in your quotation attached herewith.

Sr. No.	Agency	Descriptions	Per Unit Rate	No. of Machines / Cards	Amount Quoted after Discount (Rs.)
1.	**Team Elementals LLP** (Owned by Students of CHARUSAT)	ZAP Card Reader (V0.55) Basic RFID card reader for ZAP attendance system. • 240MHz fast processor. • 8.5cm industry standard 16x2 LCD display. • Wi-Fi support (Over MQTT protocol) • Instant data upload to middleware	[redacted]/-	130	[redacted]
		RFID Card (Blank, 13.56MHz) • Blank RFID cards • Works on 13.56MHz frequency • 1KB of data storage support • Data of students loaded before shipping • No printing on the cards	[redacted]/-	1050	[redacted]
				GST 18%	[redacted]
				Total Amount	[redacted]

Annexure VI.I

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

C S Patel Institute of Technology

U & P U. PATEL DEPARTMENT OF COMPUTER ENGINEERING

Subject Code: CE343 **Academic Year-**2021-22

Subject Name: Software Engineering **Semester: 5**th Semester

- **Students need to be wok in group of 4/5, based on random selection by faculty members for batch, same group will be there in SGP course project. They need to select real-life live client-based project**.
- **There are series of activity in class / labs for practical learning, especially for Biding of Projects, Request for Proposal, Design Thinking, Agile Methodology, Project Management Case studies, Demonstration of Tools, etc.**
- **Appendix A includes the relevant tool list for practical.**

SR. NO	UNIT TOPICS	PRACTICAL	LEARNING OUTCOMES	CO
1	Role of Software & Software engineering	**[A]Role of Software** **Background**: Software has made the world a global village today. The impact of software spans across almost all aspect of human life. All organizations, Institutions and companies are leveraging the potentials of software in automating the critical functions and eliminating manual interventions. Software is also a predominant are for trade and export especially for the countries like India. Domains like health care, Airlines, financial Services, Insurance, retails, Education, and many more have exploited software and still there a lot of the scope for software to create impact and add values in multiple dimensions. **Problem Description**: In the context of this background, identify the areas (or application or systems) how software has been leveraged extensively in the following domains 1. Health Care 2. Airlines 3. Banking Insurance 4. Retail 5. Education	1. Students should able to understand software, software development and software industry. 2. Students should able to know various domains of IT sectors.	1

		[PPT Presentation is must by group of students allocated by faculty members, each batch must cover at least one specific domain.] **[B] Role of Software Engineering in IT industry:** Case study of industry with live survey of their employee and team members for usage and usefulness of Software engineering principals, documentations, SE practices, Standards, CMM/ISO, etc. ***[Students need to do prepare questionnaires and do survey and interview to gather information and find conclusion about role of SE in IT industries]***		
2	Software Process Models	Study and compare different software process models and compare them based on cost, simplicity, risk, involvement of user, flexibility, maintenance, integrity, security, re-usability, and requirement. ***[Students need to study all models and present GroupWise; particular batch must cover each process models and finally students have to select particular process model for their SGP project with proper assessment and justification.]***	1. Students should able to justify and select their process model wisely.	1,2
3	Requirement Analysis and Specification	Design interview, record review, brain storming, questionnaires and observation techniques to elicit requirements for the given project. ***[Student must record, capture video, survey, photographs pics compulsory for all techniques of requirement gathering]***	1. Students should get experience for gathering requirements using different techniques. 2. Students should understand prose and cones of each requirement gathering techniques.	1,2,3
4	Understanding the Requirement, Requirement Specification (SRS)	Determine and analyze the functional & non- functional Requirements for a given project and then Design System Requirement Specification (SRS) document for a given project • Usecase Diagram and Usecase narratives • User Story	1. Students should Analyze and brain storm requirement and validate same. 2. Students should able to convert requirements in to SRS format.	2,3

			3. Students should able to develop Usecase diagram with its narrative and User story.	
5	Software Project Estimations & Planning	• Calculate cost estimation for the project using FP calculation and COCOMO model. After manual calculation use COSTAR/SYSTEM STAR Tool to calculate and explore other parameters for estimation of cost of your project. • Develop a Software Project Management Plan using Microsoft Project 2003/2007, JIRA/Redmine tool.	1. Students should able to estimates their project Time, Effort and Cost using Analytical techniques.	4
6	Software Design - Procedure Oriented and Database	• Prepare design document for your project (SmartDraw, Visio 2007) • Procedure oriented methodology (DFD up to level 2, Structure chart, ERD, Data Dictionary.	1. Students should know CASE tool for design and able to procedure-oriented design and Database design.	3
7	Software Design- GUI & Object Oriented (UML)	• Prepare design document for your project (SmartDraw, Visio 2007) using Object oriented methodology (UML-Class, Activity, State chart, Sequence, Collaboration) • Prepare UI Design- Input, Output and Navigation (ForeUI, PencilTool).	1. Students should able to use CASE tools for UML and GUI design.	3,4
8	Coding Standard and Software Configuration Management	• Design coding standards and guidelines for a given project in particular programming language. [Any specific IDE]. • Develop collaborative environment and software configuration management using CI/CD Pipeline tools (Cucumber, Jenkins).	1. Students should follow and practice coding standards in IDE 2. Students should learn how to use CI/CD pipeline for collaborative development.	4
9	Testing	• Design the Test Suites and Test Cases for the given project Box Testing, White Box Testing, Gray Box testing. [Manual and Automated Testing] • Use tool: Selenium Automation (Web driver, TestNG)	1. Students should able to design test cases for their functionalities. 2. Develop automation testing script suing tool.	2,4,5
			Total Hours (Lab): 30	

Case study-based Assignment

1	**Background:** Performance testing tests the non-functional requirements of the system. The different types of performance testing are load testing, stress testing, endurance testing and spike testing. **Problem Description**: Identify the type of performance testing for the following: 1. A university uses its web based portal for publishing the results of the students. When the results of an examination were announced on the website recently on a pre-planned date, the web site crashed. Which type of performance testing should have been done during web-site development to avoid this Unpleasant situation? 2. A space craft is expected to function for nearly 8 years in space. The orbit control system of the spacecraft is a real-time embedded system. Before the launch, the embedded software is to be tested to ensure that it is capable of working for 8 years in the space. Identify the suitable performance testing category to be carried out to ensure that the space craft will be functioning for 8 years in the space as required. 3. During unexpected terrorist attack, one of the popular websites crashed as many people logged into the web-site in a short span of time to know the consequences of terrorist attack and for immediate guidelines from the security personnel. After analyzing the situation, the maintenance team of that website came to know that it was the consequences of unexpected load on the system which had never happened previously. Which type of performance testing should have been done during web-site development to avoid this unpleasantsituation? Global Education Centre (GEC) at Infosys Mysore provides the training for fresh entrants. GEC uses an automated tool for conducting objective type test for the trainees. At a time, a maximum of 2000 trainees are expected to take the test. Before the tool is deployed, testing of the tool was carried out to ensure that it is capable of supporting 2000 simultaneous users. Indicate the performance testing category?
2	**Background:** There are some metrics which are fundamental and the rest can be derived from these. Examples of basic (fundamental) measures are size, effort, defect, and schedule. If the fundamental measures are known, then we can derive others. For example, if size and effort are known, we can get Productivity (=size/effort). If the total numbers of defects are known, we can get the Quality (=defect/size) and so on. **Problem Description**: Online loan system has two modules for the two basic services, namely Carloan service and House loan service. The two modules have been named as Car_Loan_Module and House_Loan_Module. Car_Loan_Module has 2000 lines of uncommented source code. House_Loan_Module has 3000 lines of uncommented source code. Car_Loan_Module was completely implemented by Mike. House_Loan_Module was completely implemented by John. Mike took 100 person hours to

	implement Car_Loan_Module. John took 200 person hours to implement House_Loan_Module. Mike‟s module had 5 defects. Jonh‟s module had 6 defects. With respect to the context given, which among the following is an INCORRECT statement? Choose One: 1. John‟s quality is better thanMike. 2. John‟s productivity is more thanMike. 3. John introduced more defects thanMike. John‟s effort is more thanMike
3	Study different CASE tools and Testing tools (QTP, qTest, IBM Rational Functional tester, MSC (message sequence chart), SDL (specification and description language), TTCN (testing and test control notation), TTCN-3) and prepare a summary report.
4	Design Thinking and Agile Methodology Activities with Presentation with Concept Poster. ***[Students need to do activities for implementation of Design Thinking and Agile Methodology separately to solve some innovative idea in group of 5-6 in batch or class]***

APPENDIX A

ESTIMATION TOOLS
COSTAR/SYSTEM STAR Tool

SOFTWARE PROJECT MANAGEMENT PLAN
Microsoft Project 2003/2007
OpenProject
LibrePlan
ProjectLibre

DESIGN TOOLS
Microsoft Visio 2007/2010/2013/2016,
Pencil Tool
ForeUI
UMLet 14.2
SmartDraw
OpenSource Tool

TESTING TOOLS
WinRunner
Silk Runner
Load Runner
Selenium/Appium

DIFFERENT CASE TOOLS AND TESTING TOOLS
QTP
QTest
IBM Rational Functional tester
MSC (message sequence chart)
SDL (specification and description language),
TTCN (testing and test control notation)
TTCN-3

Annexure VI.II

CHARUSAT
CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

IQAC
Internal Quality Assurance Cell

CERTIFICATE
OF APPRECIATION

This is to certify that

Dr/Mr/Ms. ASHWIN MAKWANA (1st POSITION)

has been recognized as Top Performer in oral presentation at a Symposium on

'Pedagogical Practices: A Key to Outcome Based Education- *Towards realizing the goals of NEP-2020'* organized by IQAC-CHARUSAT on 4th March 2023.

Dr Mayur Sutaria
Coordinator IQAC, CHARUSAT

Dr R V Upadhyay
Provost, CHARUSAT

CE143:CCP Assignment-2

www.hackerrank.com/ce143ccp-assignment-2-2022-23

Details | Challenges | Advanced Settings | Moderators | Notifications | Signups | Statistics

Contest Challenges

Add challenges to your contest by selecting challenges from our library or create and add your own challenges here. To reorder your challenges, simply select the challenge and then drag and drop to the desired location.

Add Challenge

No.	Name	Max Score	Binary	Editorial		
1.	Bill calculation at Shop	5	☐	☐	✎	×
2.	Identify whether given string is anagram	5	☐	☐	✎	×
3.	String Permutation 11	5	☐	☐	✎	×
4.	Find the smallest Element from Array	5	☐	☐	✎	×

Preview Landing Page | Preview Challenges Page | Save Changes

FACULTY OF TECHNOLOGY AND ENGINEERING

CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY

U & PU PATEL DEPARTMENT OF COMPUTER ENGINEERING

Event Summary Report

Date : 17-Jul-2023

Event Information :

Event Application ID	2022-23/00778
Event Title	Hacker-Rank Contest on C++
Event Organized as part of	Student/Faculty Club Activity
Event Type	Hackathon
Event Period	04-May-2023 To 05-May-2023

Participants Details :

Sr. No.	Participant Type	No of Participants
1	CHARUSAT Students	123
	Total	123

Associated Course(s) :

Sr. No	Course Code	Course Name
1	CE144	OBJECT ORIENTED PROGRAMMING WITH C++

Event Co-Ordinators Details :

Sr. No	Employee Code	Employee Name	Employee Role
1	833	MAYURI JAMANADAS POPAT	Convener
2	327	MRUGENDRASINH Laxmansinh RAHEVAR	Coordinator
3	8346	AAYUSHI PUSHPAKANT CHAUDHARI	Coordinator
4	8380	ASIFIQBAL YAVARMIYA THAKOR	Coordinator
5	8381	PARMANANDKUMAR SAHDEVBHAI PATEL	Coordinator
6	8395	KRUNALKUMAR JASHVANTBHAI MAHERIYA	Coordinator

CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY CHARUSAT CAMPUS CHANGA

HoD/HoI Signature

CHARUSAT UNIVERSITY OF SCIENCE AND TECHNOLOGY

U & P. U. Patel Department of Computer Engineering

Program Report

Event Application No in E-governance: 2022-23/00778

Event Name: HACKER-RANK CONTEST ON C++

Date and Time of Program: 4-5th May, 2023

Venue : 316,317 Labs, EC-EE (A6) Building.

Program coordinator **:** Prof. Mrugendrasinh Rahevar, Prof. Mayuri Popat, Prof. Aayushi Chaudhari, Prof. Parmanand Patel, Prof. Krunal Maheriya, Prof. Asifiqbal Thakor

Details about the event:

HackerRank Contests are competitive programming competitions hosted on the HackerRank platform. These contests provide a platform for programmers to showcase their coding skills and compete against each other to solve algorithmic and programming challenges.

Participants were given a set of problems to solve within a specified time limit using programming in C++ language. Contests on HackerRank were designed to test various aspects of a programmer's abilities, such as problem-solving skills, algorithmic thinking, and efficiency in writing optimized code. The problems ranged in difficulty from easy to advanced.

During a contest, participants submitted their code solutions for each problem, which were then evaluated by an automated test framework to determine correctness and efficiency. Contestants were ranked based on their scores, which were typically calculated using a combination of factors like the number of problems solved, the time taken to solve them, and the accuracy of the solutions.

Program Poster:

Attach applicable Annexure:

1. Photos
2. Event Schedule with coordinators

Annexure- I

Photographs of event:

Student Solving Problems

Student Solving Problems

Event Schedule

Annexure- II

Session	Time	Date & Day	Class	Topic
1	9:10 am to 11:10 am	4/05/2023 Thursday	CE2 Class	Various problems were given to students based on the topic: Static data members and Static Functions, Friend Functions, type conversion from one class type to another class type, Inheritance, etc.
2	9:10 am to 11:10 am	5/05/2023 Friday	CE1 Class	Various problems were given to students based on the topic: Static data members and Static Functions, Friend Functions, type conversion from one class type to another class type, Inheritance, etc.

Annexure VII.II

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

CHARUSAT
CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

Chandubhai S Patel Institute of Technology

Faculty of Technology and Engineering

U & P. U. Patel Department of Computer Engineering

Date: 09/03/2023

Event Application No in E-governance: 2022-23/00492

Event Name: SQL Wars (DBMS Hackathon)

Detail about the event:

For the first time SQL Wars (DBMS Hackathon) is organized in association with Coding Ninja dated on 4th March '23. Students were given various SQL problem statements with easy, medium and hard level. The problem statements for the hackathon were carefully curated with respect to the coding platform.

Coding Ninjas is basically one of the largest online tech education companies in India, focusing on courses on C++, Database, Java, Python, Android, Machine Learning, Data science, WebDev, interview prep, tech aptitude, etc. Coding Ninjas is the most preferred technical course platform for students in India and currently has a monopoly position across the college market in India. With the vision to reach millions in a scalable way, Coding Ninjas has pioneered a proprietary online teaching platform, which completely mirrors the offline classroom experience into online, and thus delivers a world-class learning experience to students. With an in-house placement cell, Coding Ninjas is actively involved in sourcing relevant tech openings and showcasing Coding Ninjas student's profiles to get them a rewarding career in tech.

More than 180 students have participated in SQL war; out of best three performers been awarded with good prize. The event was hosted on an online platform Coding Ninja, where all students were assigned private virtual tables which they could use to perform their statements.

We have received sum of **6500/- INR** fund for winners and certificates.

Schedule of Event:

Session No.	Session Date	Time	Expert name	Title
1	4-3-2023	10:00 am to 1:00 pm	-	• SQL Wars hackathon
2	4-3-2023	1:00 am to 2:00 pm	-	• Valedictory function

Actionable insights of Event:

Through this event; rubrics will be followed for CE246-DBMS course practical.

Winners

Position	Name	ID
1st	Jenil_Makhansa	21ce065
2nd	MATHAKIYA MOHMADANISH ABDULBHAI	21ce071
3rd	Dhaval Patel	21ce089

Valedictory function

Prize Distribution: 1st Rank

Event Venue- 618 B [Lab]

SQL Wars | CSPIT CE tech team

STARTS ON 11:30 AM, 4 MAR 2023 PRICE FREE VENUE ONLINE

Description

Ready to solve fun, challenging problems? Coding Ninjas is hosting the "SQL Wars" in collaboration with "CSPIT CE tech team", giving you the opportunity to test and grow your coding abilities while getting a sample of the programming skills needed for a technical career.

Date: 04 March 2023

SQL War Team

Annexure VII.III

CHARUSAT
CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

cspit
Chandubhai S Patel Institute of Technology

Faculty of Technology and Engineering

U & P U. Patel Department of Computer Engineering

Date: 21/ 06/2022

Practical List

Academic Year	:	2022-23	Semester	:	5th
Course code	:	CE355	Course name	:	Design and analysis of algorithms

Sr. No.		Aim	Hours	CO
1.	**Implement and analyse algorithms given below.**		**02**	**1,2**
	1.1	Factorial (Iterative and Recursive)		
	1.2	Fibonacci Series(Iterative and Recursive)		
	1.3	Linear Search and Binary Search		
2.	**Implement and analyse algorithms given below.**		**02**	**1,2**
	2.1	Bubble Sort		
	2.2	Selection Sort		
	2.3	Insertion Sort		
3.	**Divide and Conquer**		**02**	**1,2**
	3.1	Quick Sort		
	3.2	Merge Sort		
4.	**Greedy Approach**		**08**	**3,5**
	4.1	A Burglar has just broken into the Fort! He sees himself in a room with n piles of gold dust. Because each pile has a different purity, each pile also has a different value (v[i]) and a different weight (w[i]). A Burglar has a bag that can only hold W kilograms. Calculate which piles Burglar should completely put into his bag and which he should put only fraction into his bag. Design and implement an algorithm to get maximum piles of gold using given bag with W capacity, Burglar is also allowed to take fractional of pile.		
	4.2	Suppose you want to schedule N activities in a Seminar Hall. Start time and Finish time of activities are given by pair of (si,fi) for i^{th} activity. Implement the program to maximize the utilization of Seminar Hall. (Maximum activities should be selected.)		
	4.3	Find Minimum Cost spanning tree of a given undirected graph using Kruskal and Prim's algorithm. Also observe effect on experiment result of choosing those algorithms.		
	4.4	Implementation of any challenge on Hackerank.		
5.	**Dynamic Programming Approach**		**08**	**3,5**
	5.1	Let S be a collection of objects with profit-weight values. Implement the 0-1 knapsack problem for S assuming we have a sack that can hold objects with total weight W.		

	5.2	Implement a program to print the longest common subsequence for the two strings.		
	5.3	Given a chain < A1, A2,…,An> of n matrices, where for i=1,2,…,n matrix Ai with dimensions. Implement the program to fully parenthesize the product A1,A2,…,An in a way that minimizes the number of scalar multiplications. Also calculate the number of scalar multiplications for all possible combinations of matrices		
	5.4	Implementation of any challenge on Hackerank.		
6.	**Backtracking**		**02**	**4,5**
	6.1	You are given an integer N. For a given N x N chessboard. Implement a program to find a way to place 'N' queens such that no queen can attack any other queen on the chessboard. A queen can be attacked when it lies in the same row, column, or the same diagonal as any of the other queens. You have to print one such configuration**.**		
7.	**String Matching**		**02**	**3,5**
	7.1	Two strings, a pattern 'P' and a text 'T' are given. The task is to implement program to determine if the pattern occurs in the text using Rabin Karp algorithm, and if it does, print all of its occurrences; else, print -1.		
	Codechef Problems Discussion		**04**	**5**

Faculty of Technology and Engineering

U & P U. Patel Department of Computer Engineering

Date: 10/12/2022

Practical List

Academic Year	:	2022-23	Semester	:	4th
Course code	:	CE245	Course name	:	Data Structures & Algorithms

Sr. No.	Aim	CO
1.	Implement Linear Search and Binary Search using array data structure.	1,2
2.	In a far away Galaxy of Tilky Way, there was a planet Tarth where the sport of Competitive Coding was very popular. According to legends, there lived a setter known for loving knapsack type problems. Given N objects in a row, with weights W1,W2,...,WN, you need to find the maximum number of consecutive objects you can fill in a bag of maximum capacity C such that the total weight of objects taken is at least K. In other words, pick objects such that-The total weight of collected objects is at least K. The total weight does not exceed C. The objects picked must be consecutive (i.e. a subarray of the objects need to be picked) The number of objects is maximized. You need to print this maximum value. Note-If no such object could be picked, then the answer is obviously 0. Input • The first line of input contains T, number of test cases in a file. • The next line contains three integers, N, C and K, as described in the problem statement. • The next line contains N space separated integers, denoting Wi, i.e. weight of the object. Output • For test case, output the maximum number of objects you can pick. Input 2 5 5 5 5 4 3 2 1 5 5 4 1 4 1 1 1 Output 2 2	1,5

3.	3.1 Implement following operations of singly linked list. (a) Insert a node at front (b) Insert a node at end (c) Insert a node after given node information (d) Delete a node at front (e) Delete a node at last 3.2 Implement following operations of doubly linked list. (a) Insert a node at front (b) Insert a node at end (c) Insert a node after given node information (d) Delete a node at front (e) Count number of nodes 3.3 Implement following operations of circular singly linked list. (a) Inserting a node at front (b) Delete a node at end **Note: Display content of linked list after each operation.**	1,2
4.	Implement Sorting Algorithm(s). (a) Bubble Sort (b) Selection Sort (c) Insertion Sort (d) Quick Sort	1,2
5.	Chef and his little brother are playing with sticks. They have total N sticks. Length of i-th stick is Ai. Chef asks his brother to choose any four sticks and to make a rectangle with those sticks its sides. Chef warns his brother to not to break any of the sticks, he has to use sticks as a whole. Also, he wants that the rectangle formed should have the maximum possible area among all the rectangles that Chef's brother can make. Chef's little brother takes this challenge up and overcomes it. Can you also do so? That is, you have to tell whether it is even possible to create a rectangle? If yes, then you have to tell the maximum possible area of rectangle. Input • The first line contains a single integer T denoting the number of test-cases. T test cases follow. • The first line of each test case contains a single integer N denoting the number of sticks. • The second line of each test case contains N space-separated integers A1, A2, ..., AN denoting the lengths of sticks. Output • For each test case, output a single line containing an integer representing the maximum possible area for rectangle or -1 if it's impossible to form any rectangle using the available sticks. Input 2 5 1 2 3 1 2 4 1 2 2 3	1,2,5

	Output 2 -1	
6.	6.1 Implement basic operations (push (), pop () and display ()) of stack using array. 6.2 Implement basic operations (push (), pop () and display ()) of stack using linked list.	1,2,3
7.	Chef has a string which contains only the characters '{', '}', '[', ']', '(' and ')'. Now Chef wants to know if the given string is balanced or not. If is balanced then print 1, otherwise print 0. A balanced parenthesis string is defined as follows: • The empty string is balanced • If P is balanced then (P), {P}, [P] is also balanced • if P and Q are balanced PQ is also balanced For example "([])", "({})[()]" are balanced parenthesis strings while " ([{]})", "())" are not balanced. Input The first line of the input contains a single integer T denoting the number of test cases. The description of T test cases follows. The first and only line of each test case contains a single string Output For each test case, print a single line containing the answer. Input: 4 () ([]) ([{}()])[{}] [{{}] Output: 1 0 1 0	1,2,3,5
8.	8.1 Implement basic operations (enqueue (), dequeue () and display ()) of queue using array. 8.2 Implement basic operations (enqueue (), dequeue () and display ()) of queue using linked list. 8.3 Implement basic operations (enqueue (), dequeue () and display ()) of circular queue using array.	1,2,3
9.	Chef has a sequence A1, A2, … … … AN and an integer K. Now there is a sliding window of size K which is moving from the very left of the array to the very right and at a particular time Chef has access to only those elements that are present in that window and Chef wants to find the number of the distinct elements of each window of size K. Help Chef to find the answer.	1,5

	Input The first line of the input contains a single integer T denoting the number of test cases. The description of T test cases follows. The first line of each test case contains two integers N and K. The second line contains N space-separated integers A1,A2,A3,…..A_N Output For each test case, print a single line containing space-separated integers — the number of the distinct elements of each window of size from the very left of the array to the very right of the sequence. Example Input 2 6 3 5 8 5 4 4 1 4 2 4 5 2 2 Output: 2 3 2 2 2 2 1 Explanation: Example case 1: Number of the distinct elements of [5, 8, 5], [8, 5, 4] [5, 4, 4], [4, 4, 1] are respectively 2, 3, 2, 2.	
10.	Implement Binary Search Tree (BST) using following operations. (a) Insert (b) Search Traversal (Inorder, Preorder, Postorder)	1,2
11.	Implement a Graph to perform following operations. 11.1 Adjacency list representation 11.2 Apply DFS and BFS on the given graph.	1,2
12.	In an array of 20 elements, arrange 15 different values, which are generated randomly between 1,00,000 to 9,99,999. Use hash function to generate key and linear probing to avoid collision. $H(x) = (x \bmod 18) + 2$. Write a program to input and display the final values of array.	1,2

Annexure VIII

CHARUSAT
CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

cspit
Chandubhai S Patel Institute of Technology

Faculty of Technology and Engineering

U & P U. Patel Department of Computer Engineering

Date: 16/08/2023

Action Taken from Feedback received from Parents.

Practical List

Subject code	:	CE258	Semester	:	4	Academic Year	:	2022-23
Subject name	:	Microprocessor and Computer Organization						

Sr. No.	Aim	Hrs.	CO
1.	Assembling of Computer.	2	1
2.	Write a program to convert a given number system to other number system.	4	1
3.	Implement a circuit in Logisim to display given binary number in decimal on to seven segment display.	2	1
4.	Implement a circuit in Logisim which perform Addition and Subtraction of sign number.	2	1
5.	Write a program which perform multiplication using booth algorithm.	4	2
6.	Implement a circuit in Logisim which perform Arithmetic and Logic unit.	4	2
7.	(Basics of assembly level programming) Perform following operations on 8-bit data addition, and, Logical left shift, Rotate left with carry subtraction, or, Logical right shift, Rotate left without carry multiplication, xor, Arithmetic left shift, Rotate right with carry division, not, Arithmetic right shift, Rotate right without carry	2	3
8.	(Array handling in Assembly level programming) Create an array. Perform addition of all even numbers from array and save answer in one variable.	2	3
9.	(String Handling in Assembly level language) Find out whether the given string is palindrome or not and print appropriate message. Don't use procedure.	2	3

10.	(Procedure in Assembly Level Language) Write an assembly code to evaluate the answer of blow given series and store the answer in ANS variable. Program should have only one procedure to compute factorial of number. Series: 1! -2+3!-4+5!-6+7!-8+9!-10	2	3
11.	Write a assembly level code for given c program.	2	3
	Submission	2	
Prepared By:	Ronak Patel, Asifiqbal Thakor	**Date:**	02/12/2022

Practical List

Subject code	:	IT144	Semester	:	1	Academic Year	:	2022-23
Subject name	:	ICT Workshop						

Sr. No.	Aim
1.	Introduction to computer Hardware, Types of Memory, Types of Motherboard, Types of Processors.
2.	Assembly of computer.
3.	Installation of Linux and windows using VMWare.
4.	Learning linux and windows commands.
5.	MOOC on Google Workspace
6.	Workshop on Github
7.	Playing with Computer Network
8.	Introduction to types of network cables, ports, types of ethernet, data speeds on network, network cards, learning ip addressing and data transfer using LAN and configuring WiFi router
9.	Introduction to Arduino/ESP32 & implement sample programs of i. Blink LED, ii. LED with timer and iii. LED control from Switch.
10.	Implement interfacing of sensors with Arduino/ESP32. (Ultrasonic Sensor, Temperature and humidity, Light Sensor with Buzzer)
11.	Design following mobile applications using MIT app inventor: i. Talk to me app ii. Bal bounce app iii. Digital Doodle app and iv. Bluetooth client app
12.	Learn to utilize Bluetooth Module on ESP32 and implement codes to : i. scan Bluetooth devices in range ii. connect Bluetooth device and transfer data from and to ESP32 with APP iii. control LED on ESP32 through Bluetooth app.
13.	Learn to utilize Wi-Fi Module on ESP32 and implement codes to : i. scan Wi-Fi networks ii. set up a simple Wi-Fi web server to blink an LED from the web and iii. set up a Wi-Fi access point and provide a web server on it.
14	Learn to utilize Raspberry Pi and implement codes to : i. print text and adjust color of rgb lcd display ii. control led on and off depending of value detected by sound sensor iii. vary intensity of led with reference to rotation detected by rotary angle sensor.