Pimpri Chinchwad Education Trust's

PIMPRI CHINCHWAD COLLEGE OF ENGINEERING

SECTOR NO. 26, PRADHIKARAN, NIGDI, PUNE 411044

An Autonomous Institute Approved by AICTE and Affiliated to SPPU, Pune

DEPARTMENT OF COMPUTER ENGINEERING (REGIONAL LANGUAGE)

Exit Policy

of

First Year, Second Year and Third Year B. Tech. Computer Engineering (Regional Language) (Regulations 2023)

Effective from Academic Year 2025-26

Institute Vision

To be one of the top 100 Engineering Institutes of India in coming five years by offering exemplarily Ethical, Sustainable and Value Added Quality Education through a matching ecosystem for building successful careers.

Institute Mission

1. Serving the needs of the society at large through establishment of a state-of-art Engineering Institute
2. Imparting right Attitude, Skills, Knowledge for self-sustenance through Quality Education
3. Creating globally competent and Sensible engineers, researchers and entrepreneurs with an ability to think and act independently in demanding situations

EOMS Policy

“We at PCCOE are committed to offer exemplarily Ethical, Sustainable and Value Added Quality Education to satisfy the applicable requirements, needs and expectations of the Students and Stakeholders.

We shall strive for technical development of students by creating globally competent and sensible engineers, researchers, and entrepreneurs through Quality Education.

We are committed for Institute’s social responsibilities and managing Intellectual property.

We shall achieve this by establishing and strengthening state-of-the-art Engineering Institute through continual improvement in effective implementation of Educational Organizations Management Systems (EOMS).”

	Pimpri Chinchwad Education Trust's Pimpri Chinchwad College of Engineering	
Course Approval Summary		

A) Board of Study - Department of Computer Engineering (Regional Language)

Sr. No.	Name of the Course	Course Code	Page number	Signature and stamp of BoS
1.	Web Development Laboratory	BCER22EX11	14	
2.	Data Visualization Laboratory	BCER22EX12	17	
3.	Mini Project	BCER22EX13	19	
4.	Advanced Java Programming Laboratory	BCER24EX11	22	
5.	Mini Project	BCER24EX12	25	
6.	Mini Project	BCER26EX11	28	
7.	Internship	BCER26EX12	30	

Chairman
BoS, Computer Engineering
(Regional Language)
PCET's Pimpri Chinchwad College of Engineering
Sect. 25, Pradhikaran, Nigdi, Pune-411044.

Approved by Academic Council:

Chairman
Academic Council
PCET's, Pimpri Chinchwad College of Engineering
Sector No. 26, Pradhikaran, Nigdi, Pune-44

Chairman, Academic Council
Pimpri Chinchwad College of Engineering

	Pimpri Chinchwad Education Trust's **Pimpri Chinchwad College of Engineering**

Multiple Exit Options

Preamble :

Pimpri Chinchwad College of Engineering (PCCoE) is an autonomous institute affiliated to Savitribai Phule Pune University (SPPU). PCCOE has started implementing National Education Policy 2020 (NEP 2020) from the academic year 2023-24. NEP 2020 emphasizes holistic development, flexible curriculum, integration of technology in teaching and learning processes and multidisciplinary approach. University Grant Commission (UGC) in its guidelines for multiple entry and exit highlights flexible learning leading to the award of certificate, diploma, and degree. To meet the objectives of NEP 2020, PCCoE is offering a flexible curriculum with multiple exit options in line with directives received from Higher and Technical Education Department of Government of Maharashtra.

PCCoE recommends a 4 years multidisciplinary Bachelor's programme as the preferred option since it allows the opportunity to experience the full range of holistic and multidisciplinary education in addition to a focus on major and minor subjects as per the student's preference.

However, in case of unavoidable circumstances if students need to give up their education they can opt to exit at the end of 2^{nd} or 4^{th} or 6^{th} semester after completing additional 8 credits as prescribed in this document. Students will be allowed to take the exit option after counseling by class teacher, proctor, academic coordinator and head of the department.

Students need to register in Academic Bank of Credit (ABC) for availing this option. The Academic Bank of Credits (ABC), a National-level facility provides flexibility of the curriculum framework and interdisciplinary/multidisciplinary academic mobility of students across the Higher Education Institutes (HEIs) in the country with appropriate "Credit Transfer" mechanism. It would facilitate credit accumulation through the facility created by the ABC scheme in the "Academic Bank Account" opened for students across the country to transfer and consolidate the credits earned by them by undergoing courses in any of the eligible HEIs (PCCoE). The ABC allows for credit redemption through the process of commuting the accrued credits in the Academic Bank Account maintained in the ABC for the purpose of fulfilling the credits requirements for the award of certificate/diploma/degree by the authorized HEIs (PCCoE). Upon collecting a certificate,

diploma or degree, all the credits earned till then, in respect of that certificate, diploma or degree, shall stand debited and deleted from the account concerned.

Multiple Exits:

Students will have the flexibility to enter a programme in odd semesters and exit a programme after the successful completion of even semesters as per their future career needs. The student has to earn the minimum credits as mentioned in table 1 and should not have any backlogs. The student has to submit a request for exiting the programme to the Academic Council Chairman through the BoS Chairman within 2 weeks of declaration of results. The additional 8 credits need to be earned during the Summer Vacation (within 2 months of approval of Exit Request).

Table 1: Exit option after 2nd or 4th or 6th Semester[Ref: NEP GR, Government of Maharashtra Point 2 and Point 7]

Sr. No.	Levels and Semester Completion	Qualification Title	Regular Credit Requirement	Additional Credits to be Earned
1	Level : 4.5 Semester 2	One Year UG Certificate in the relevant Discipline	Minimum 40 credits	8 Credits of VSEC/Internship/ Apprenticeship per the relevant programme
2	Level:5.0 Semester :4	Two Year UG Diploma in the relevant Discipline	Minimum 80 credits	8 Credits of VSEC/Internship/Mini Project as per the relevant programme
3	Level 5.5 Semester:6	Three Year B. Voc/ B.Sc in the relevant Discipline	Minimum 120 credits	8 Credits of VSEC/Internship/Mini Project as per the relevant programme

The Table 1 is interpreted as follows.

Students exiting the First Year programme after securing minimum 40 credits will be awarded one year UG Certificate in the relevant Discipline provided they secure 8 credits in work-based vocational courses or internship / Apprenticeship offered during summer vacation in addition to 4 credits from skill-based courses earned during the first and second semester.

Students exiting the Second Year Programme after securing minimum 80 credits will be awarded Two Years UG Diploma in the relevant Discipline provided they secure additional 8 credits in skill-based vocational courses (skill-based courses, internship, mini projects etc.) offerd during summer vacation after the fourth semester.

Students exiting the 3-year UG program will be awarded Three Years B. Voc./ B.Sc in the relevant Discipline upon securing minimum 120 credits with additional 8 credits in skill-based vocational courses (skill-based courses, internship, mini projects etc.) offered during summer vacation after the sixth semester.

Exit options shall be provided with Certification, Diploma and B. Vocational/ B.Sc degrees to the students at the end of the second, fourth and sixth semester, respectively, in the four-year degree programme. However the duration of completion of UG Engineering Degree Program is 8 years from the date of admission to first year.

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LIST OF ABBREVIATIONS IN CURRICULUM STRUCTURE

Sr. No.	Abbreviation	Expansion
1.	L	Lecture
2.	P	Practical
3.	T	Tutorial
4.	H	Hours
5.	CR	Credits
6.	FA	Formative Assessment
8.	SA	Summative Assessment
9.	TW	Term Work
10.	OR	Oral
11.	PR	Practical
12.	PROJ	Project

Curriculum Structure for Exit Program

First and Second Year B. Tech.

Computer Engineering (Regional Language)

CURRICULUM STRUCTURE

F. Y. B.Tech. (Computer Engineering (Regional Language)) Exit Programme Semester II

First Year B. Tech Computer Engineering (Regional Language) (Regulations 2023) (With effect from Academic Year 2025-26)																
Course Code	**Course Name**	**Credit Scheme**				**Teaching Scheme (Hours/Week)**			**Evaluation Scheme and Marks**							
									FA		**SA**	**TW**	**PR**	**OR**	**Total**
		L	**P**	**T**	**Total**	**L**	**P**	**T**	**FA1**	**FA2**					
BCER22EX11	Web Development Laboratory	-	4	-	4	-	8	-	-	-	-	100	-	-	100
BCER22EX12	Data Visualization Laboratory	-	2	-	2	-	4	-	-	-	-	50	-	-	50
BCER22EX13	Mini Project	-	2	-	2	-	4	-	-	-	-	50	-	-	50
Total		**-**	**8**	**-**	**8**	**-**	**16**	**-**	**-**	**-**	**-**	**200**	**-**	**-**	**200**

L-Lecture, **P**-Practical, **T**-Tutorial, **H**-Hours, **Cr**-Credits, **FA**-Formative Assessment, **SA**-Summative Assessment, **TW**-Term Work, **OR**-Oral, **PR**-Practical

CURRICULUM STRUCTURE

S. Y. B.Tech. (Computer Engineering (Regional Language)) Exit Programme Semester IV

Second Year B. Tech Computer Engineering (Regional Language) (Regulations 2023) (With effect from Academic Year 2025-26)																
Course Code	**Course Name**	**Credit Scheme**				**Teaching Scheme (Hours/Week)**			**Evaluation Scheme and Marks**							
									FA		**SA**	**TW**	**PR**	**OR**	**Total**
		L	**P**	**T**	**Total**	**L**	**P**	**T**	**FA1**	**FA2**					
BCER24EX11	Advanced Java Programming Laboratory	-	4	-	4	-	8	-	-	-	-	100	-	-	100
BCER24EX12	Mini Project	-	4	-	4	-	8	-	-	-	-	100	-	-	100
Total		**-**	**8**	**-**	**8**	**-**	**16**	**-**	**-**	**-**	**-**	**200**	**-**	**-**	**200**

L-Lecture, **P**-Practical, **T**-Tutorial, **H**-Hours, **Cr**-Credits, **FA**-Formative Assessment, **SA**-Summative Assessment, **TW**-Term Work, **OR**-Oral, **PR**-Practical

CURRICULUM STRUCTURE

T. Y. B.Tech. (Computer Engineering (Regional Language)) Exit Programme Semester VI

Second Year B. Tech Computer Engineering (Regional Language) (Regulations 2023) (With effect from Academic Year 2025-26)																
Course Code	**Course Name**	**Credit Scheme**				**Teaching Scheme (Hours/Week)**			**Evaluation Scheme and Marks**							
									FA		**SA**	**TW**	**PR**	**OR**	**Total**	
		L	**P**	**T**	**Total**	**L**	**P**	**T**	**FA1**	**FA2**						
BCER26EX11	Mini Project	-	4	-	4	-	8	-	-	-	-	100	-	-	100	
BCER26EX12	Internship	-	4	-	4	-	8	-	-	-	-	100	-	-	100	
Total		**-**	**8**	**-**	**8**	**-**	**16**	**-**	**-**	**-**	**-**	**200**	**-**	**-**	**200**	

L-Lecture, **P**-Practical, **T**-Tutorial, **H**-Hours, **Cr**-Credits, **FA**-Formative Assessment, **SA**-Summative Assessment, **TW**-Term Work, **OR**-Oral, **PR**-Practical

Curriculum

F. Y. B.Tech. (Computer Engineering (Regional Language)) Exit Programme

Program :	B.Tech (Computer Engineering (Regional Language))					Semester: II
Course :	Web Development Laboratory					Code :BCER22EX11

Credit	Teaching Scheme (Hrs./Week)			Evaluation Scheme and Marks			
	Lecture	Practical	Tutorial	TW	PR	OR	Total
4	-	8	-	100	-	-	100

Prior knowledge of -- is essential

Course Objectives:

1. To understand the basics of Web Designing using HTML, DHTML, and CSS.
2. To learn about the Client side scripting languages.
3. To learn the basics about Server side programming languages.
4. To learn and understand Server side frameworks.

Course Outcomes:

After learning the course, the students will be able to:

1. To understand the use of web servers in web application development.
2. Design web page using cascading style sheets.
3. Design and develop static web application using client side technologies.
4. Design and develop business logic of the web application using server side programming.
5. Design and develop dynamic/enterprise web applications and deploy using web server.

Guidelines for Students:

1. The laboratory assignments are to be submitted by students in the form of a journal.
2. Each assignment write-up should have Title, Objectives, Outcomes, Theory- Concept in brief, dataset used, data description, conclusion, and assessor's sign.
3. Program codes with sample output of all performed assignments should be submitted.

Guidelines for Laboratory/Term Work Assessment:

1. Continuous assessment of laboratory work is done based on the overall performance and laboratory performance of the students.
2. Each laboratory assignment assessment should assign grade/marks based on parameters with appropriate weightage.
3. Suggested parameters for overall assessment as well as each laboratory assignment assessment include- timely completion, performance, innovation, efficiency, punctuality and neatness.

Guidelines for Laboratory Conduction

1. For mini project, select a real-world application in the group of 3-4 students and formulate a problem statement for application to be developed.
2. Student groups are required to continue same problem statement throughout all the assignments in order to design and develop an application as a part of mini project. Further assignments will be useful for students to develop an application.

Suggested List of Assignments

Assignment No.	Assignment Title
1	Case study: Before coding of the website, planning is important, students should visit different websites (Min. 5) for the different client projects and note down the evaluation results for these websites, either good website or bad website in following format:

	<table><tr><th>Sr. No.</th><th>Website URL</th><th>Purpose of Website</th><th>Things liked in the website</th><th>Things disliked in the website</th><th>Overall evaluation of the website (Good/Bad)</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>
2	Installation and Configuration of Web Servers Apache Tomcat,XAMPP, WebSphere, Jboss, Glassfish and use of Integrated Development Environment.
3	Design any 4 page static website using HTML and CSS/Bootstrap.
4	Designing dynamic web pages using different cascading style sheets
5	Design a Registration form demonstrating Field level validation using javascript.
6	Design a form demonstrating Submit level validation using javascript.
7	Design and implement a simple calculator using JavaScript.
8	Demonstrate the use of arrays by creating a PHP web page e.g. Create an indexed array of 20 elements (e.g. student_name) and search whether a given name exists in the array.
9	Create a webpage using PHP to demonstrate the Inheritance concept such as: to create a Class shape and its subclass triangle, square and circle and display area of the selected shape.(use the concept of Inheritance) Display menu(use radio button) a) Triangle b) Square c) Circle
10	Design Employee Registration form and store and retrieve the data using PHP and MySql.
11	Write a Servlet program to create and manage the session and cookies.
12	PHP program to create simple Login and Logout using sessions.
13	Implement the program demonstrating the use of JSP. e.g., Create a database table students_info (stud_id, stud_name, class, division, city) using database like Oracle/MySQL etc. and display (use SQL select query) the table content using JSP.
14	**Mini Project:** Create Static/Dynamic web application using Content management systems like Wordpress/Joomla/Drupal. Sample case study: Write a blog / e-commerce site / calendar / to-do site or any site which needs updates frequently

Text Books:

1. Jeffrey C.Jackson, “Web Technologies: A Computer Science Perspective”, Second Edition, Pearson Education, 2007, ISBN 978-0131856035.

2. Robert W. Sebesta, “Programming the World Wide Web”, 4th Edition, Pearson education, 2008.
3. Achyut Godbole & Atul Kahate, “Web Technologies: TCP/IP to Internet Application Architectures”, McGraw Hill Education publications, ISBN, 007047298X, 9780070472983
4. Ralph Moseley & M. T. Savaliya, “Developing Web Applications”, Wiley publications, ISBN 13: 9788126538676

Reference Books:

1. Marty Hall, Larry Brown, “Core Web Programming”, Second Edition, Pearson Education, 2001, ISBN 978- 0130897930.
2. H.M. Deitel, P.J. Deitel and A.B. Goldberg, “Internet & World Wide Web How to Program”, Third Edition, Pearson Education, 2006, ISBN 978-0131752429.
3. Chris Bates, “Web Programming Building Internet Applications”, 3rd Edition, Wiley India, 2006.
4. Xue Bai et al, “The web Warrior Guide to Web Programming”, Thomson, 2003.
5. Adam Bretz & Colin J Ihrig, “Full Stack JavaScript Development with MEAN”, SPD, ISBN-13: 978-0992461256
6. Giulio Zambon, “Beginning JSP, JSF and Tomcat”, Apress Publication, ISBN-10: 1430246235; ISBN-13: 978- 1430246237
7. Jeremy McPeak& Paul Wilton, “Beginning JavaScript”, Wrox Publication, ISBN-13: 978-0470525937
8. Robin Nixon, “Learning PHP, MySQL and JavaScript with JQuery, CSS & HTML5”, O'REILLY, ISBN: 13:978-93-5213-015-3

Program:	B. Tech. (Computer Engineering (Regional Language))					Semester: II	
Course:	Data Visualization Laboratory					Code: BCER22EX12	
Credit	Teaching Scheme (Hrs./Week)			Evaluation Scheme and Marks			
	Lecture	Practical	Tutorial	TW	PR	OR	Total
2	-	4	-	50	-	-	50

Prior knowledge of Linear algebra Programming Skills **is essential**

Course Objectives:

This course aims at enabling students

1. To learn how to manipulate datasets using Python libraries.
2. To apply data pre-processing techniques and interpret through various graphs.
3. To build a strong statistical and algorithmic foundation to infer insights.

Course Outcomes:

After learning the course, the students will be able to:

1. Demonstrate Data Science tools and Environment.
2. Apply pre-processing techniques and visualize the data using Python libraries.
3. Analyze different types of data modeling algorithms.
4. Summarize the report on the Data Science application.

Guidelines for Students:

1. Laboratory Instructors may design a suitable set of assignments for each topic. All topics should be addressed. For every topic, at least three lab assignments should be framed and approved during the module meeting.
2. For each laboratory assignment, it is essential for students to write the title, aim, topic theory, algorithm, mathematical background, and data set description (as applicable).
3. Laboratory Journal- Program codes with sample output of all performed assignments are to be submitted as softcopy.
4. Term Work –Term work is a continuous assessment that evaluates a student's progress throughout the semester. Laboratory Instructors may design rubrics to assess assignments and mini-projects.
5. Practical Examination should be conducted on a given list of topics.

Detailed Syllabus

Suggested List of Assignments

Assignment No.	Assignment Title
1.	**Data Science Tools and Environment, Python programming basics** ● Introduction to the laboratory environment (e.g., Jupyter Notebook, Python IDEs) ● Introduction to the Data Science ● Python Programming for Data Science ● Python Data Structures ● Introduction to data manipulation libraries (e.g., Pandas, NumPy, MatPlotlib)
2.	**Data Acquisition and Cleaning** ● Data importing from various sources (CSV, JSON, SQL databases) ● Data scraping techniques (web scraping, API integration) ● Data cleaning and preprocessing (handling missing values, outliers, etc.)

3.	**Data Visualization and Exploratory Data Analysis (EDA)** ● Data visualization libraries (e.g., Matplotlib, Seaborn) ● Exploratory Data Analysis techniques (summary statistics, data distribution analysis, correlation analysis)
4.	**Statistical / Algorithmic Data Modeling** ● Hypothesis testing, probability distributions, etc. ● Basics of classification and regression algorithms ● Model evaluation techniques (performance metrics) ● Hands-on exercises with sci-kit-learn library
5.	**Mini-Project Development and Presentation** ● Development of Mini-Project and its presentations diverse examples of case studies in data science for Mini-project Predictive Maintenance in Manufacturing, Churn Prediction in Telecom Industry, Fraud Detection in Financial Transactions, Healthcare Predictive Analytics, etc.

References:

Reference Books:

- Grus Joel, Data Science from Scratch, O'Reilly Media Inc., ISBN: 9781491901427
- McKinney Wes, Python for Data Analysis, O' Reilly media, ISBN: 978-1-449-31979-3. 4. Python

Web reference:

1. https://onlinecourses.nptel.ac.in/noc22_cs32/
2. https://www.coursera.org/specializations/introduction-data-science
3. https://www.linkedin.com/learning/topics/data-science
4. https://www.mygreatlearning.com/academy/learn-for-free/courses/basics-of-data-visualization-for-data-science
5. https://www.simplilearn.com/data-science-free-course-for-beginners-skillup?source=SidebarWidget_SkillUp
6. https://www.scaler.com/topics/course/python-for-data-science/
7. https://www.mygreatlearning.com/data-science/free-courses
8. https://www.mygreatlearning.com/data-visualization/free-courses

Program:	B. Tech. (Computer Engineering (Regional Language))						Semester: II
Course:	Mini Project						Code: BCER22EX13
Credit	Teaching Scheme			Evaluation Scheme			
	Lecture	Practical	Tutorial	TW	PR	OR	Total
2	-	4	-	50	-	-	50

Prior knowledge of Domain related subjects, Engineering Mathematics **is essential.**

Course Objectives:

1. To understand the Project Development Process.
2. To review of literature for project work from appropriate sources such as books, manuals, research journals and from other sources, and in turn increase analytical skills.
3. To design and implement real world application using available platforms.
4. To validate and evaluate the work undertaken.
5. To prepare an insightful and well-organized research paper for the selected problem statement.

Course Outcomes:

After learning the course, the students will be able to:

1. Identify and analyze the realistic problem of societal or research relevance.
2. Design an application by considering suitable requirements
3. Develop an application by considering actual requirements and social, environmental, ethical and legal issues
4. Test and evaluate the model results to develop a probable solution.
5. Prepare an insightful and well-organized report for the selected problem statement.

Project Work:

The intention of the minor project work is to conceive a research idea and to implement it systematically by using knowledge derived during the course of education mainly to innovate or facilitate. A group of Under Graduate students at Final Year will undertake research project work as minor project. Minor project work involves following activities:

i. Review of Recent Literature or existing systems
ii. Requirement Analysis and Feasibility Study
iii. Defining the Problem Statement and Objectives
iv. Identifying the Project Implementation Requirements
v. Formulation of Methodology and Mathematical Modeling
vi. Project Implementation and Testing
vii. Observations & Results

viii. Results Analysis and Validation

ix. Conclusions

Guidelines for Research Project Work:

1. **Selection of Project:** Student shall identify the area or topics in recent trends and developments in consultation with project guide.
2. **Guide Allotment:**
3. Considering registered student's area of interest/domain and expertise of guide, the project coordinator allots project guides.
4. **Project Review:**
    a. The project guide will evaluate the timely progress of the project work.
    b. Student is expected to appear for minimum 3 reviews as per the project calendar.

5. **Plagiarism**

A student has to ensure that the report / research publications are checked for plagiarism by using plagiarism checking software with good rating. The maximum similarity allowed is 10%.

6. **Outcomes**

Based on the project results and conclusions, students are recommended to generate the research outcomes in terms of research paper publication journal/conference/participation event. This has to be done in consultation with project guides. Guides will decide the appropriateness of the results and converting those into outcomes.

Curriculum

S. Y. B.Tech. (Computer Engineering (Regional Language)) Exit Programme

Program:	B. Tech. (Computer Engineering (Regional Language))				Semester: IV		
Course:	Advanced Java Programming Laboratory				Code: BCER24EX11		
Credit	Teaching Scheme			Evaluation Scheme			
	Lecture	Practical	Tutorial	TW	PR	OR	Total
4	-	8	-	100	-	-	100

Prior Knowledge of:

Decision control structures, loop control structures, arrays, Functions, pointers, structure and union, searching and sorting techniques.

is essential.

Course Objectives:

1. To understand the basic concepts of Java.
2. To learn object-oriented programming using Java.
3. To learn front end design using SWING and JavaFX.
4. To learn and understand the concepts of Servlets and Session Management.
5. To learn and comprehend Java Server Pages and Java Server Faces.
6. To learn REST API.

Course Outcomes:

After learning the course, students will be able to:

1. Apply Java fundamentals and Object Oriented Programming principles
2. Apply multithreading concepts for concurrent execution of the program.
3. Design Web application using Servlets and JDBC.
4. Implement Web application using Java Server pages and JDBC.
5. Develop Web application using Java Server faces.
6. Design high end applications using REST API

Guidelines:

- The laboratory assignments are to be submitted by students in the form of a journal. Journal consists of prologue, Certificate, table of contents, and handwritten write-up of each assignment.
- Each assignment write-up should have Title, Objectives and Outcomes, Theory- Concept in brief, Algorithm, Flowchart, Testcases, Conclusion, Assessment grade/marks and assessor's sign.
- Program codes with sample output of all performed assignments are to be submitted as softcopy.

Assignment No.	Suggested List of Assignments
1.	**Assignment will be conducted based on the following topics.** **Introduction to Java programming:** The Java Virtual Machine, Variables and data types, Conditional and looping constructs, Arrays.
2.	**Assignment will be conducted based on the following topics.** **Object-oriented programming with Java Classes and objects:** Fields and Methods, Constructors, Overloading methods, Garbage collection, Nested classes.

3.	**Assignment will be conducted based on the following topics.** **Inheritance:** Overriding methods, Polymorphism, Making methods and classes final, Abstract classes and methods, Interfaces. Exception handling with try-throw-catch-finally constructs: The Exception class, The Object class: Cloningobjects, The JDK Linked List class, Strings, Strings Conversions.
4.	**Assignment will be conducted based on the following topics.** **Collection Framework:** List, Set & Map interfaces, Vector, ArrayList, LinkedList, Hashtable, HashMap, TreeMap, Iterator, Enumerator,Que, Deque, SortedQue, HashSet, TreeSet, LinkedHashSet, Compare and Comparable. Introduction of Generics. Working with types: Wrapper classes, Enumeration interface Packages Package access, Documentation comments.
5.	**Assignment will be conducted based on the following topics.** **The I/O Package:** Input Stream and Output Stream classes, Reader and Writer classes, Threads: Synchronization
6.	**Assignment will be conducted based on the following topics.** **SWING (JFC):** Introduction Diff B/W AWT and SWING, Components hierarchy, Panes,Individual Swings components J Label, JButton, JTextField, JTextAres. JavaFX: JavaFX Architecture, JavaFX Program Structure, Shapes, Effects, LayoutComponents, Properties and Bindings, Basic UI Controls, Graphics and Animation.
7.	**Assignment will be conducted based on the following topics.** **Web Application, Web Container, Project Setup & JDBC** Web application, Web client and web server, client and server communication, HTTP protocol basics HTML language basics, TCP/IP port, URL? Need for a Web Container, JDBC Introduction, JDBC features JDBC, Drivers Setting up a database annd creating a schema, Writing JDBC code to connect to DB, CRUD Operations with JDBC, Statement types in JDBC, Types of Rowset, ResultSet in JDBC
8.	**Assignment will be conducted based on the following topics.** **Servlets and Session Management** Servlets Introduction, Need and Working, HTTP Methods; GET, POST, PUT, DELETE, TRACE, OPTIONS. GET/POST request; differences between the two, Servlet Lifecycle, Servlet Context and Servlet Config, Forwarding and Redirection of requests.
9.	**Assignment will be conducted based on the following topics.** **Java Server Pages** Introduction to JSP and need for JSPs, Basic HTML tags, JSP Lifecycle, JSP Elements: Scriptlets Expressions, Declaration, Significance of above elements and fitment into the JSP Lifecycle, Directives in JSP, JSTL: JSP Standard Actions
10.	**Assignment will be conducted based on the following topics.** **Enterprise Java Beans** Entity Beans, Message Beans, and Session Bean
11.	**Assignment will be conducted based on the following topics.** **MVC & Struts Framework** MVC, MVC Type1 and Type2 architecture, truts framework? Struts 1 overview, Struts 1 and Struts 2 comparison, Components of Model, Views and Controller in Struts Framework, Declarative and Annotations configuration approaches

12.	**Assignment will be conducted based on the following topics.** **Hibernate Framework** ORM, ORM principle, ORM Implementation, Introduction to Hibernate, Hibernate Architecture, Peristent classes, Hibernate CRUD, setting up connection to DB using Hibernate

Textbooks:

1. Herbert Schildt,"Java - The Complete Reference", The McGraw-Hill Education,11th Edition,2018, 978- 9390491629.
2. E. Balagurusamy, "Programming with Java" McGraw Hill Education India, 6th Edition, 2019, 9789353162337.
3. Java The Complete Reference, Ninth Edition, by Herbert Schildt, McGraw Hill Education
4. Head First Servlets and JSP, Kathy Sierra, Bryan Basham, Bert Bates, O'Reilly Media, Inc.

Reference Books:

1. D.T. Editorial Services, "Java 8 Programming Black Book", Dreamtech Press India Pvt. Ltd., Paperback, 2015, 9789351197584.
2. Ken Arnold, James Gosling and David Holmes, "The Java Programming Language", Addison-Wesley, 4th Edition, 2005, 0321349806.

Program:	B. Tech. (Computer Engineering (Regional Language))						Semester: IV
Course:	Mini Project						Code: BCER24EX12
Credit	Teaching Scheme			Evaluation Scheme			
	Lecture	Practical	Tutorial	TW	PR	OR	Total
4	-	8	-	100	-	-	100

Prior knowledge of Domain related subjects, Engineering Mathematics **is essential.**

Course Objectives:

1. To understand the Project Development Process.
2. To review of literature for project work from appropriate sources such as books, manuals, research journals and from other sources, and in turn increase analytical skills.
3. To design and implement real world application using available platforms.
4. To validate and evaluate the work undertaken.
5. To prepare an insightful and well-organized research paper for the selected problem statement.

Course Outcomes:

After learning the course, the students will be able to:

1. Identify and analyze the realistic problem of societal or research relevance.
2. Design an application by considering suitable requirements
3. Develop an application by considering actual requirements and social, environmental, ethical and legal issues
4. Test and evaluate the model results to develop a probable solution.
5. Prepare an insightful and well-organized report for the selected problem statement.

Project Work:

The intention of the minor project work is to conceive a research idea and to implement it systematically by using knowledge derived during the course of education mainly to innovate or facilitate. A group of Under Graduate students at Final Year will undertake research project work as minor project. Minor project work involves following activities:

i. Review of Recent Literature or existing systems
ii. Requirement Analysis and Feasibility Study
iii. Defining the Problem Statement and Objectives
iv. Identifying the Project Implementation Requirements
v. Formulation of Methodology and Mathematical Modeling
vi. Project Implementation and Testing
vii. Observations & Results

viii. Results Analysis and Validation

ix. Conclusions

Guidelines for Research Project Work:

1. **Selection of Project:** Student shall identify the area or topics in recent trends and developments in consultation with project guide.
2. **Guide Allotment:**
3. Considering registered student's area of interest/domain and expertise of guide, the project coordinator allots project guides.
4. **Project Review:**
    a. The project guide will evaluate the timely progress of the project work.
    b. Student is expected to appear for minimum 3 reviews as per the project calendar.
5. **Plagiarism**

A student has to ensure that the report / research publications are checked for plagiarism by using plagiarism checking software with good rating. The maximum similarity allowed is 10%.

6. **Outcomes**

Based on the project results and conclusions, students are recommended to generate the research outcomes in terms of research paper publication journal/conference/participation event. This has to be done in consultation with project guides. Guides will decide the appropriateness of the results and converting those into outcomes.

Curriculum

T. Y. B.Tech. (Computer Engineering (Regional Language)) Exit Programme

Program:	B. Tech. (Computer Engineering (Regional Language))						Semester: VI
Course:	Mini Project						Code: BCER26EX11
Credit	Teaching Scheme			Evaluation Scheme			
	Lecture	Practical	Tutorial	TW	PR	OR	Total
4	-	8	-	100	-	-	100

Prior knowledge of Domain related subjects, Engineering Mathematics **is essential.**

Course Objectives:

1. To understand the Project Development Process.
2. To review of literature for project work from appropriate sources such as books, manuals, research journals and from other sources, and in turn increase analytical skills.
3. To design and implement real world application using available platforms.
4. To validate and evaluate the work undertaken.
5. To prepare an insightful and well-organized research paper for the selected problem statement.

Course Outcomes:

After learning the course, the students will be able to:

1. Identify and analyze the realistic problem of societal or research relevance.
2. Design an application by considering suitable requirements
3. Develop an application by considering actual requirements and social, environmental, ethical and legal issues
4. Test and evaluate the model results to develop a probable solution.
5. Prepare an insightful and well-organized report for the selected problem statement.

Project Work:

The intention of the minor project work is to conceive a research idea and to implement it systematically by using knowledge derived during the course of education mainly to innovate or facilitate. A group of Under Graduate students at Final Year will undertake research project work as minor project. Minor project work involves following activities:

x. Review of Recent Literature or existing systems
xi. Requirement Analysis and Feasibility Study
xii. Defining the Problem Statement and Objectives
xiii. Identifying the Project Implementation Requirements
xiv. Formulation of Methodology and Mathematical Modeling
xv. Project Implementation and Testing
xvi. Observations & Results
xvii. Results Analysis and Validation
xviii. Conclusions

Guidelines for Research Project Work:

7. **Selection of Project:** Student shall identify the area or topics in recent trends and developments in consultation with project guide.
8. **Guide Allotment:**
9. Considering registered student's area of interest/domain and expertise of guide, the project coordinator allots project guides.
10. **Project Review:**
    a. The project guide will evaluate the timely progress of the project work.
    b. Student is expected to appear for minimum 3 reviews as per the project calendar.
11. **Plagiarism**

A student has to ensure that the report / research publications are checked for plagiarism by using plagiarism checking software with good rating. The maximum similarity allowed is 10%.

12. **Outcomes**

Based on the project results and conclusions, students are recommended to generate the research outcomes in terms of research paper publication journal/conference/participation event. This has to be done in consultation with project guides. Guides will decide the appropriateness of the results and converting those into outcomes.

Program:	B. Tech. (Computer Engineering (Regional Language))					Semester: VI	
Course:	Internship					Code: BCER26EX12	
Credit	Teaching Scheme			Evaluation Scheme			
	Lecture	Practical	Tutorial	OR	PR	TW	Total
4	--	8	-	--	--	100	100

Preamble:

The Institute will allow internships in various organizations. Students will be allotted internship in a company based on merit or any other criterion laid down by the company. In some cases, the students may be allowed to arrange internship. In that case a student can take a letter from the placement/respective department and contact the company. The confirmation letter from the company has to be submitted in the placement / respective department

Students will be associated with one faculty from respective department who will act as internal mentor. After internship duration, internal mentor will assess the student's performance

General Guidelines:
Student can take internship work in the form of Online/Onsite mode from any of the following but not limited to:

- Industry / Government Organization Internship
- Eduskills, Internshala, ByteXL (Platinum Placement) etc
- EDC Cell and startups cells of institute / In-house product development, intercollegiate, inter department research internship under research lab/group etc.
  - Here, students can work as an Incubitee under Incubation and Innovation Cell at Institute (CIIL) and should get registered as a Start-up to avail the Internship opportunity.
- Research internship under Professors (Internal and External), IISC, IIT's, NIT's and other Research organizations.
- Participate in open-source contribution
- Any other with the permission of faculty mentor

Internship Progress Monitoring:

Internship Process Flow:

1. Internship opportunity will be provided by 3 ways- Through Training & Placement Cell, Through Department/Faculty/Searched by own (Students).
2. The student has to take permission from faculty mentor and internship coordinator to verify quality of internship.
3. Student has to submit the Internship offer letter or official mail communication proof to internship coordinator.
4. After permission the student needs to start the Internship program.
5. The intern student must report about the Internship program to faculty mentor.
6. At the end of the Internship program, student should submit completion certificate from industry and report.
7. Student feedback of Internship needs to be submitted by intern student.

Internship Work Evaluation:

- Students will be allotted to faculty mentors
- Students will be allowed to do internship at the end of semester and till the commencement of 4th semester.
- Students will do internship for minimum of 4-weeks (40-45 hours/week) through which they can earn 3 credits.
- If students are in summer term, then they have to manage their time for summer term academic activities (if any) and internship.

Annexure

Annexure A

Mini Project Assessment Details (2 Credits)

Sr. No.	Method of Assessment	Details	Marks
1	Review I	Presentation of Project topic, Motivation, Literature Survey, Scope and Objectives	10
2	Review II	Requirement Analysis, Design and 50% model implementation	20
3	Review III	100% implementation of project, testing and validation, report presentation	20
4	**TW**	**Review1 + Review2 + Review3**	**50**
	Total Marks		**50**

Mini Project Assessment Details (4 Credits)

Sr. No.	Method of Assessment	Details	Marks
1	Review I	Presentation of Project topic, Motivation, Literature Survey, Scope and Objectives	20
2	Review II	Requirement Analysis, Design and 50% model implementation	40
3	Review III	100% implementation of project, testing and validation, report presentation	40
4	**TW**	**Review1 + Review2 + Review3**	**100**
	Total Marks		**100**

Vision and Mission of Computer Engineering (Regional Language) Department

Department Vision

To be a pioneering computer engineering program in the regional language, by developing ethical professionals ready for academia, research, industry, entrepreneurship and preserving culture through technology.

Department Mission

M1: To educate students on cutting-edge technologies, fostering problem-solving capabilities and teamwork skills through a contemporary curriculum, without language barriers.

M2: To foster innovative thinking and collaborative research through a state-of-the-art computing environment.

M3: To develop professionals with strong ethical values and a deep understanding of cultural contexts to make a positive impact on society.