Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Program structure for B. Tech. Computer Science and Engineering

Second Year Computer Science and Engineering Programs Semester III: Teaching Scheme

Course code	Course name	Teaching scheme (Hrs./week)			Credits assigned			Total credits
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	
U14BS301	Statistics and Numerical Techniques	3	-	-	3	-	-	3
U14PC302	Computer Organization & Architecture	3	-	-	3	-	-	3
U14PC303	Object Oriented Programming using C++	3	-	-	3	-	-	3
U14MM0X	Multidisciplinary Minor I	2	-	-	2	-	-	2
U14OE01X	Open Elective I	2	-	-	2	-	-	2
U01EM001	Engineering Economics	2	-	-	2	-	-	2
U14PC304	Computer Organization & Architecture Lab	-	2	-	-	1	-	1
U14PC305	Object Oriented Programming using C++ Lab	-	4	-	-	2	-	2
U01VE001	Environmental Sciences	2	-	-	2	-	-	2
U14FP001	Field Project I		4	-	-	2	-	2
	Total	**17**	**10**	**-**	**17**	**5**	**-**	**22**

*Open Elective is selected from the bucket of Open Elective List:

Second Year Computer Science and Engineering Programs Semester III: Evaluation Scheme

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course code	Course name	Theory Marks					Practical Marks		Total
		Internal Assessment				ESE	Term work	Practical Oral/POE	
		T1	T2	FET	Total				
U14BS301	Statistics and Numerical Techniques	10	10	5	25	50	-	-	75
U14PC302	Computer Organization & Architecture	10	10	5	25	50	-	-	75
U14PC303	Object Oriented Programming using C++	10	10	5	25	50	-	-	75
U14MM0X	Multidisciplinary Minor I	10	-	5	15	35	-	-	50
U14OE01X	Open Elective I	10	-	5	15	35	-	-	50
U01EM001	Engineering Economics	10	-	5	15	35	-	-	50
U14PC304	Computer Organization & Architecture Lab	-	-	-	-	-	25	-	25
U14PC305	Object Oriented Programming using C++ Lab	-	-	-	-	-	25	25	50
U01VE001	Environmental Sciences	10	-	5	15	35	-	-	50
U14FP001	Field Project I	-	-	-	-	-	25	25	50

* Minimum passing is 40% for all courses and evaluation head mentioned above. FET – Faculty evaluation for Theory , T1, T2, Continuous Assessment Test, Term Work , ESE - End Semester Examination, P/F – Pass/ Fail Course, AU – Audit Course

*Multidisciplinary Minor offered are:

Programmer structure for B. Tech. Computer Science and Engineering Multi-Disciplinary Minor for Technology

Track 1:

	Multidisciplinary Minor in Networking

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Minor	Sr. No	Code	Title of the Course	Credits
I	1.	U14MM011	Data communication	2

Track 2:

		Track 2: Multidisciplinary Minor in DATA SCIENCE		
Minor	Sr. No	Code	Title of the Course	Credits
I	1.	U14MM021	Data Science and Analytics	2

Track 3:

		Track 3: Multidisciplinary Minor in CYBER SECURITY		
Minor	Sr. No	Code	Title of the Course	Credits
I	1.	U14MM031	Privacy And Security in Online social media	2

2. Programmer structure for B. Tech. Computer Science and Engineering Multi-Disciplinary Minor for University

		Multidisciplinary Minor in Software Development		
Minor	Sr. No	Code	Title of the Course	Credits
I	1.	U14MM061	Software Development	2

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Programme structure for B. Tech. Computer Science and Engineering
Second Year Computer Science and Engineering Programs Semester IV: Teaching Scheme

Course code	Course Name	Teaching scheme (Hrs/week)			Credits assigned			Total credits
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	
U14PC401	Data Structure	3	-	-	3	-	-	3
U14PC402	Operating System	3	-	-	3	-	-	3
U14PC403	Database Management System	2	-	-	2	-	-	2
U14MM0XX	Multidisciplinary Minor II	2	-	-	2	-	-	2
U14OE02XX	Open Elective II	2	-	-	2	-	-	2
U01EM002	Engineering Management	2	-	-	2	-	-	2
U14VS401	Software Proficiency I (Java Programming)	-	4	-	-	2	-	2
U14PC404	Data Structure Lab	-	2	-	-	1	-	1
U14PC405	Database Management System Laboratory	-	2	-	-	1	-	1
U03AE002 U03AE003	Modern Indian Language – Hindi OR Modern Indian Language – Sanskrit	2	-	-	2	-	-	2
U03VE003	Universal Human Values II	2	-	-	2	-	-	2
	Total	18	8		18	4		22

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Second Year Computer Science and Engineering Programs Semester IV: Evaluation Scheme

Course code	Course Name	Theory Marks					Practical Marks		Total
		Internal Assessment				ESE	Term work	Practical Oral /POE	
		T1	T2	FET	Total				
U14PC401	Data Structure	10	10	5	25	50	-	-	75
U14PC402	Operating System	10	10	5	25	50	-	-	75
U14PC403	Database Management System	10	10	5	25	50	-	-	75
U14MM0XX	Multidisciplinary Minor II	10	-	5	15	35	-	-	50
U14OE02XX	Open Elective II	10	-	5	15	35	-	-	50
U01EM002	Engineering Management	10	-	5	15	35	-	-	50
U14VS401	Software Proficiency I (Java Programming)	-	-	-	-	-	25	25	50
U14PC404	Data Structure Lab	-	-	-	-	-	25	-	25
U14PC405	Database Management System Laboratory	-	-	-	-	-	25	-	25
U03AE002 U03AE003	Modern Indian Language – Hindi OR Modern Indian Language – Sanskrit	10	-	5	15	35	-	-	50
U03VE003	Universal Human Values II	10	-	5	15	35	-	-	50

* Minimum passing is 40% for all courses and evaluation head mentioned above. FET – Faculty evaluation for Theory, T1, T2, Continuous Assessment Test, Term Work, ESE - End Semester Examination, P/F – Pass/ Fail Course, AU – Audit Course

Exit Option:
- o 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.
- o Students exiting the Second Year Programme after securing minimum 80credits will be awarded UG Diploma in the relevant Discipline /Subject provided they secure additional 8 credits in skill-based vocational courses (skill-based courses, internship, mini projects etc) offered during summer vacation after the second year.

Sanjay Ghodawat University, Kolhapur
Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U14BS301	Statistics and Numerical Techniques	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U14BS301	Statistics and Numerical Techniques	10	10	5	25	40%	50	40%	75

Course Description

The objective of this course is to provide second-year engineering students with a solid foundation in statistical analysis and numerical techniques, enabling them to apply these methods effectively in engineering problem-solving and decision-making contexts.

Pre-requisites: U01BS201-Applied Mathematics II.

Course Objectives

- To equip students with the analytical tools and methodologies necessary for effective data analysis, decision-making, and problem-solving.

- To equip students with to develop appropriate models for curve fitting to given datasets.

- To equip students with the theoretical understanding and practical skills necessary for effectively solving Algebraic, Transcendental Equations and linear equations using numerical methods

Course Outcomes: After the successful completion of the course students will able to:

    CO1   **Apply** measures of central tendency to interpret and summarize data accurately.

    CO2   **Utilize** probability distributions to solve problems in engineering and science.

    CO3   **Estimating** the appropriate curve to approximate the bivariate data.

    CO4   **Solve** nonlinear and system of linear equations numerically.

Course Contents

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Module	Unit	Description	Hours
1.0		**Statistics**	**9**
1	1.1	Introduction, Measures of central Tendency: Mean, Median, Mode. Dispersion.	
	1.2	Measures of Dispersion: Range, Variance, And Standard Deviation, Data Visualization Techniques: Histograms, Box Plots and Scatter Plots.	
2.0		**Probability Distribution**	**9**
2	2.1	Random variable, Discrete probability distribution, continuous probability distribution, Probability density function.	
	2.2	Binomial distribution, Poisson distribution and Normal distribution.	
3.0		**Sampling Techniques and Estimation**	**9**
3	3.1	Fitting of curves by method of least squares, Coefficient of correlation.	
	3.2	Regression coefficients, relation between coefficient of regression and regression coefficient, Lines of regression of bivariate data.	
4.0		**Regression Analysis**	**9**
4	4.1	Introduction, Bracketing method, Roots of Equation by Bisection Method, False position method.	
	4.2	Open method, Roots of Equation by Secant Method, Newton- Raphson method, multiple roots by Newton Raphson method.	
5.0		**Numerical Techniques**	9
5	5.1	Direct Methods of Solution – Solution of Linear Systems by Matrix inversion method, Gaussian Elimination method, Gauss Jordan method.	
	5.2	Iterative Methods of Solution-Gauss Seidal method, Jacobi iterative method.	

Text Books

1. Introduction to Probability and Statistics for Engineers and Scientists by Sheldon M. Ross

![Sanjay Ghodawat University, Kolhapur]

Sanjay Ghodawat University, **Kolhapur**

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

2. Numerical Methods for Engineers" by Steven C. Chapra and Raymond P. Canale

References

1. Statistics for Engineering and the Sciences by William Mendenhall, Terry Sincich, and Douglas C. Montgomery

2. Numerical Recipes: The Art of Scientific Computing by William H. Press, Saul A. Teukolsky, William T. Vetterling, and Brian P. Flannery

Internal Assessment (T1, T2 and FET)

1. T1 (Test 1) should be based on first two modules and T2 (Test 2) should be based on next two modules, for 10 marks each.

2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.

2. The duration of end semester examination shall be Two hours.

3. The students need to solve all 5 questions.

4. Question No.1 will be compulsory and based on entire syllabus.

5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

****

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	**Practical**	**Tutorial**	**Theory**	**Practical**	**Tutorial**
U14PC302	Computer						

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

	Organization & Architecture	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U14PC302	Computer Organization & Architecture	10	10	5	25	40%	50	40%	75

Course Description

The course has been designed to introduce fundamental principles of Computer Organization and Microprocessor. The students completing this course will understand basic of Computer Organization and Microprocessor, including CPU, ALU, Control Unit, Memory hierarchy, Computer performance, pipelining, Instruction Set and addressing modes of 8086 and Assembly programming of 8086. Finally, students will gain experience in learning concepts of Computer Organization and Programing of 8086 microprocessor

Pre-requisites: U01ES004- Basic Electrical and Electronics Engineering and U01VS001- Workshop Practice-I: C Programming

Course Objectives

- To understand basic components of computers.

- To understand the architecture of 8086 processor

- To Understand the principles of hardwired and microprogrammed control, including microprogram sequencing in addressing it.

- To describe the basic concept and hierarchy of memory systems in digital computing

- To understand the parallelism both in terms of single and multiple processors.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1**   **Explain[2]** architectures of Microprocessors for demonstrating working of data, address and control bus by using its pin configuration.

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

- **CO2**   Describe[2] an assembly language program for given problem statement using 8086 microprocessor instruction set.

- **CO3**   Explain[2] the evolution of computers & computer organization basics for understanding of the components of the system with the use of the architecture diagram.

- **CO4**   Illustrate[3] Control design and memory organization for designing of the memory system by using independent memory chips.

- **CO5**   Explain[4] concepts of parallel processing and vector processing architecture for designing of the parallel processors by using the pipeline architectures.

Course Contents

Module	Unit	Description	Hours
1.0		**8086 microprocessor**	**9**
1	1.1	Introduction to Microprocessors, Features, pin functions and internal architecture of 8086.Flag register, Memory segmentation, Segment Registers, Physical address - calculation with examples, Physical memory organization. Interfacing 8086 with memory and I/O devices under minimum mode (Block-diagram level), Comparison between Minimum mode and Maximum mode configuration	
	1.2	Addressing modes - with example, Role of index and pointer registers. 8086 instruction set- Data transfer, arithmetic, logical, shift and rotate, branching, loop control and string instructions, processor control instructions with simple examples.	
2.0		**8085 assembly language programming**	**9**
2	2.1	ALP program development cycle, development tools, MASM-Assembler directives, structure of assembly program, sample programs -with relevant comments- such as data transfer,	
	2.2	Code conversion, largest/smallest, sorting, and searching, string palindrome and other simple programs. Comparison of procedure and macro.	
3.0		**Basic Computer Organization**	**9**
3	3.1	Evolution of computers - Mechanical era, Electronic computers, CPU organization, Data representations, Instruction Sets, RISC & CISC, definition,	

Sanjay Ghodawat University, **Kolhapur**

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

		comparison and examples.	
	3.2	Basic concepts, Hardwired control Unit, Micro-programmed control unit, Memory Technology, Memory Systems, Caches: Main features	
4.0		**Memory**	**9**
4	4.1	Basic concept and hierarchy, semiconductor RAM memories, 2D & 2 1/2D memory organization. ROM memories.	
	4.2	Cache memories: concept and design issues & performance, address Mapping and replacement Auxiliary memories: magnetic disk, magnetic tape and optical disks Virtual memory: concept implementation.	
5.0		**Computer Arithmetic and Different parallel processing architectures**	**9**
5	5.1	Number representation : Signed Integers ,Fixed point numbers, Floating point numbers, Floating point arithmetic's: Floating point addition, other Floating point operations, Booth's Algorithm, IEEE Standards for Floating point representations (Single & Double Precision Format)	
	5.2	Different parallel processing architectures: Introduction to Associative memory processors, Principles of multithreading, Latency hiding techniques.	

Text Books

1. A. K.Ray , K M Bhurchandi, "Advanced Microprocessor & Peripherals", Tata McGraw Hill,3nd Edition,2013

2. Carl Hamacher, Zvonko Vranesic, Safwat Zaky Computer Organization, McGraw-Hill, Fifth Edition, Reprint 2012

3. John P. Hayes, Computer Architecture and Organization, Tata McGraw Hill, Third Edition, 1998

References

1. William Stallings, Computer Organization and Architecture-Designing for Performance, Pearson Education, Seventh edition, 2006

2. David A. Patterson and John L. Hennessy, "Computer Architecture-A Quantitative Approach", Elsevier, a division of reed India Private Limited, Fifth edition, 2012

3. Douglas V Hall, "Microprocessor & Interfacing: Programming and Hardware", Tata McGraw Hill, 2nd

Edition,2006

4. Computer System Architecture - M. Mano

Internal Assessment (T1, T2 and FET)

1. T1 should be based on first two modules and T2 should be based on next two modules, for 10 marks each.
2. FET shall be assessed for 5 marks separately..

End Semester Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

****

Course Code	Course Name	Teaching Scheme (Hr/week)	Credits Assigned

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

U14PC303	Object Oriented Programming using C++	Theory	Practical	Tutorial	Theory	Practical	Tutorial
		03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
U14PC303	Object Oriented Programming using C++	T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
		10	10	5	25	40%	50	40%	75

Course Description

This course Object-Oriented Programming using C++ is an essential course designed for second-year computer engineering students to master the principles and practices of object-oriented programming (OOP) using the C++ programming language. This course serves as a foundational building block for understanding modern software development methodologies and techniques.

Pre-requisites: U01VS001- Workshop Practice-I: C Programming

Course Objectives:

- To explore & understand the principles of Object Oriented Programming (OOP).
- To use the object-oriented paradigm in program design. Idea about interference, diffraction and polarisation etc.
- To provide object-oriented programming insight using C++
- To lay a foundation for advanced programming.

Course Outcomes: After the successful completion of the course students will able to:

![Sanjay Ghodawat University, Kolhapur logo]

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

- **CO1** **Apply[3]** the concept of class, object, array, pointers inheritance and polymorphism to solve mathematical problems using C++ programming language.

- **CO2** **Make[3]** use of the various library utilities and advanced features like Template, STL to execute and handle multiple programs using C++ programming language

- **CO3** **Develop[3]** application using Stream I/O and File I/O to perform read and write operations using C++ programming language.

- **CO4** **Develop[3]** application to solve real world problems by using C++ programming language.

- **CO5** **Analyze[4]** the strengths of object oriented programming.
.

Course Contents

Module	Unit	Description	Hours
1.0		**Fundamentals of Object Oriented Programming**	**9**
1	1.1	Introduction to procedural, modular, generic and object-oriented programming techniques, limitations of procedural programming, Need of object-oriented programming, OOP Paradigms, Fundamentals of object-oriented programming: Namespaces, objects, classes, data members, methods, messages, data encapsulation, data abstraction and information hiding, inheritance, polymorphism. Benefits of OOP, C++ as object oriented programming language	
	1.2	C++ Programming- C++ programming Basics, Data Types, Structures, Enumerations, control structures, Arrays and Strings, Class, Object, class and data abstraction, Access specifiers, separating interface from implementation. Functions- Function, function prototype, accessing function and utility function, Constructors and destructor, Types of constructor, Objects and Memory requirements, Static members: variable and functions, inline function, friend function.	
2.0		**Inheritance and Pointers**	**9**
2	2.1	Inheritance- Base Class and derived Class, protected members, relationship between base Class and derived Class, Constructor and destructor in Derived Class, Overriding Member Functions, Class Hierarchies, Public and Private Inheritance, Types of Inheritance, Ambiguity in Multiple Inheritance, Virtual Base Class, Abstract class, Friend Class , Nested Class.	

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

	2.2	Pointers: declaring and initializing pointers, indirection Operators, Memory Management: new and delete, Pointers to Objects, this pointer, Pointers Vs Arrays, accessing Arrays using pointers, Arrays of Pointers, Function pointers, Pointers to Pointers, Pointers to Derived classes, Passing pointers to functions, Return pointers from functions, Null pointer, void pointer.	
3.0		**Polymorphism**	**9**
3	3.1	Polymorphism- Introduction to Polymorphism, Early and late binding, Types of Polymorphism: Operator Overloading- concept of overloading, operator overloading, Overloading Unary Operators, Overloading Binary Operators, Data Conversion, Type casting (implicit and explicit), Pitfalls of Operator Overloading and Conversion, Keywords explicit and mutable. Function overloading	
	3.2	Run Time Polymorphism- Pointers to Base class, virtual function and its significance in C++, pure virtual function and virtual table, virtual destructor, abstract base class	
4.0		**Files and Streams and Exception Handling**	**9**
4	4.1	Data hierarchy, Stream and files, Stream Classes, Stream Errors, Disk File I/O with Streams, File Pointers, and Error Handling in File I/O, File I/O with Member Functions, Overloading the Extraction and Insertion Operators, memory as a Stream Object, Command-Line Arguments, Printer output	
	4.2	Exception Handling- Fundamentals, other error handling techniques, simple exception handling- Divide by Zero, Multiple catching, re-throwing an exception, exception specifications, user defined exceptions, processing unexpected exceptions, constructor, destructor and exception handling, exception and inheritance.	
5.0		**Standard Template Library**	**9**
5	5.1	Templates- , The Power of Templates, Function template, overloading Function templates, and class template, class template and Nontype parameters, template and friends Generic Functions, The typename and export keywords.	
	5.2	Introduction to STL, STL Components, Containers- Sequence container and associative containers, container adapters, Application of Container classes:	

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

		vector, list, Algorithms- basic searching and sorting algorithms, min-max algorithm, set operations, heap sort, Iterators- input, output, forward, bidirectional and random access. Object Oriented Programming – a road map to future	

Text Books

1. E Balagurusamy Object-Oriented Programming with C++.7th edition. McGraw-Hill Publication, ISBN 10: 9352607996 ISBN 13: 9789352607990.
2. Robert Lafore, ― Object-Oriented Programming in C++‖, fourth edition, Sams Publishing, ISBN:0672323087 (ISBN 13: 9780672323089

References

1. Herbert Schildt, ―C++ The complete reference‖, Eighth Edition, McGraw Hill Professional, 2011, ISBN:978-00-72226805
2. Matt Weisfeld, ―The Object-Oriented Thought Process, Third Edition Pearson ISBN-13:075-2063330166.
3. Cox Brad, Andrew J. Novobilski, ―Object –Oriented Programming: An EvolutionaryApproach‖, Second Edition, Addison–Wesley, ISBN:13:978-020-1548341
4. Deitel, "C++ How to Program", 4th Edition, Pearson Education, ISBN:81-297-0276-2

Internal Assessment (T1, T2 and FET)

1. T1 should be based on first two modules and T2 should be based on next two modules, for 10 marks each.
2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

****

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U14MM011	Data communication	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U14MM011	Data communication	10	-	5	15	40%	35	40%	50

Course Description

Data Communication is a foundational course in computer engineering that explores the principles, techniques, and technologies used to transmit, receive, and exchange data between devices and systems. This course covers various aspects of data communication, including transmission media, protocols, network architectures, and the OSI model. Students will learn about different networking technologies, such as Ethernet, TCP/IP, and wireless communication, and gain hands-on experience with networking hardware and software.

Pre-requisites: - Basic understanding of computer systems and networks.

Familiarity with programming concepts and languages.

Course Objectives

- Understand the fundamental principles of data communication and networking
- Identify different types of transmission media and their characteristics
- Explain the layers of the OSI model and their functions in data communication.
- Analyze and design network architectures based on specific requirements

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Identify**[2] different types of transmission media and their properties
- **CO2** **Describe**[2] the operation of various networking protocols, such as TCP/IP and Ethernet
- **CO3** **Implement**[3] network protocols and services, such as DHCP, DNS, and NAT.
- **CO4** **Implement**[3] a network routing Algorithms for a given scenario or requirement.
- **CO5** **Design**[4] and implement a network solution for a given scenario or requirement.

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Contents

Module	Unit	Description	Hours
1.0		**Introduction to Data Communication**	**6**
1	1.1	Definition and Importance of Data Communication Components of Data Communication System Data Transmission Modes: Simplex, Half-Duplex, Full-Duplex.	
	1.2	Transmission Media: Guided (Twisted Pair, Coaxial Cable, Fiber Optic) and Wireless (Radio Waves, Microwaves, Infrared)	
2.0		**Networking Fundamentals**	**6**
2	2.1	Basics of Computer Networks, Network Topologies: Bus, Star, Ring, Mesh , Network Devices: Switches, Routers, Hubs, Modems	
	2.2	Network Protocols and Standards: TCP/IP, OSI Model, Local Area Networks (LANs), Wide Area Networks (WANs)	
3.0		**Data Link Layer**	**6**
3	3.1	Functions and Services of Data Link Layer, Error Detection and Correction Techniques and example solving.	
	3.2	Data Link Control Protocols: HDLC, PPP, Medium Access Control (MAC) Protocols: CSMA/CD, CSMA/CA, Ethernet Standards and Operation	
4.0		**Network Layer**	**6**
4	4.1	Role and Functions of Network Layer, Routing Algorithms: Distance Vector, Link State	
	4.2	Internet Protocol (IP) and IP Addressing, Subnetting and Supernetting,IPv4 vs. IPv6	
5.0		**Transport Layer and Application Layer**	**6**
5	5.1	Functions and Services of Transport Layer, Transmission Control Protocol (TCP) and User Datagram Protocol (UDP).	
	5.2	Domain Name System (DNS),Hypertext Transfer Protocol (HTTP), File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP)	

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Text Books

1. Data and Computer Communications" by William Stallings.

2. Computer Networking: A Top-Down Approach" by James F. Kurose and Keith W. Ross

References

1. Computer Networks" by Andrew S. Tanenbaum and David J. Wetherall

2. TCP/IP Illustrated, Volume 1: The Protocols" by Kevin R. Fall and W. Richard Stevens

3. Networking Essentials" by Microsoft Official Academic Course

Internal Assessment (T1 and FET)

1. T1 should be based on First to Fourth modules, for 10 marks.

2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 35 marks comprise of 5 questions, each carrying 7 marks

2. The duration of end semester examination shall be Two hours.

3. The students need to solve all questions.

4. Question No.1 will be compulsory and based on entire syllabus.

5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

****

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U14MM021	Data Science and Analytics	02	00	-	02	--	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U14MM021	Data Science and Analytics	10	-	5	15	40%	35	40%	50

Course Description

This course introduces the scope of data science and analytics. Statistical fundamentals required for data science are introduced. Overview of tools for data science is given. Data science project life cycle is discussed. Exploratory Data Analysis and the Data Science Process are illustrated.

Pre-requisites: Basics of computer programming C/C++.

Course Objectives:

- Understand and describe the role of data science and its tools.
- Understand and describe the role of big data and cloud computing in data science.
- Provide an overview of machine learning techniques such as supervised learning, unsupervised learning, and semi-supervised learning
- Discuss ethical issues surrounding data science, including privacy, bias, and data misuse.

Course Outcomes: After the successful completion of the course students will able to:

	CO1	**Describe**[2] the role of data science and its tools**.
•	CO2	**Describe**[2] the role of big data and cloud computing in data science..
•	CO3	**Apply**[4] mathematical and statistical principles to the analysis of data..
•	CO4	**Apply**[F] the techniques of Exploratory Data Analysis.

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Contents

Module	Unit	Description	Hours
1.0		**Introduction**	**6**
1	1	Introduction to Data Science – Evolution of Data Science – Data Science Roles – Stages in a Data Science Project – Applications of Data Science in various fields – Data Security Issues.	
2.0		**Data Collection and Data Pre-Processing**	**6**
2	2	Data Collection Strategies – Data Pre-Processing Overview – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization.	
3.0		**Exploratory Data Analytics**	**6**
3	3	Descriptive Statistics – Mean, Standard Deviation, Skewness and Kurtosis – Box Plots – Pivot Table – Heat Map – Correlation Statistics – ANOVA.	
4.0		**Model Development**	**6**
4	4	Simple and Multiple Regression – Model Evaluation using Visualization – Residual Plot – Distribution Plot – Polynomial Regression and Pipelines – Measures for In-sample Evaluation – Prediction and Decision Making.	
5.0		**Model Evaluation**	**6**
5	5	Generalization Error – Out-of-Sample Evaluation Metrics – Cross Validation – Overfitting – Under Fitting and Model Selection – Prediction by using Ridge Regression – Testing Multiple Parameters by using Grid Search.	

Text Books

1.	Jojo Moolayil, "Smarter Decisions : The Intersection of IoT and Data Science", PACKT, 2016.

References

1.	Cathy O'Neil and Rachel Schutt , "Doing Data Science", O'Reilly, 2015.
2.	David Dietrich, Barry Heller, Beibei Yang, "Data Science and Big data Analytics", EMC 2013
3.	Raj, Pethuru, "Handbook of Research on Cloud Infrastructures for Big Data Analytics", IGI Global.

Internal Assessment (T1, T2 and FET)

1. T2 should be based on First to Fourth modules, for 10 marks.

2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 35 marks comprise of 5 questions, each carrying 7 marks

2. The duration of end semester examination shall be Two hours.

3. The students need to solve all questions.

4. Question No.1 will be compulsory and based on entire syllabus.

5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

*****

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U14MM031	Privacy And Security in Online social media	02	00	-	02	--	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		Total (Marks)
		T1	T2	FET	Total	Min pass	Marks	Min pass	
U14MM031	Privacy And Security in Online social media	10	-	5	15	40%	35	40%	50

Course Description

This course provides an in-depth exploration of the privacy and security challenges inherent in online social media platforms. Students will examine the risks associated with sharing personal information online and learn strategies for protecting their privacy and security in the digital realm.

Pre-requisites: Basics of computer application.

Course Objectives:

- Identify common privacy risks associated with sharing personal information on social media.
- Investigate techniques for enhancing personal data protection and digital privacy awareness
- Understand the tactics used by malicious actors to exploit vulnerabilities in social media platforms.
- Advocate for privacy-conscious behaviors and responsible digital citizenship in online social networks.

Course Outcomes: After the successful completion of the course students will able to:

• CO1	Define key concepts related to privacy and security in online social media.
• CO2	Explore the historical development and evolution of privacy concerns in social media platforms.
• CO3	Analyze the impact of privacy breaches and security incidents on individuals and society.
• CO4	Explore best practices for detecting and responding to security threats in social media environments.

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Contents

Module	Unit	Description	Hours
1.0		**Foundations of Privacy and Security in Social Media**	**6**
1	1.1	Definition of privacy and security in the context of online social media. Overview of the importance of privacy and security in digital communication platforms. Exploration of the evolution of privacy concerns and security threats in social media environments.	
	1.2	Examination of key historical events and milestones shaping privacy discourse in social media. Discussion of landmark cases and legislative developments related to online privacy rights. Analysis of societal attitudes towards privacy and the evolution of privacy norms in the digital age.	
2.0		**Identifying Risks and Threats in Social Media Platforms**	**6**
2	2.1	Exploration of common privacy risks associated with sharing personal information on social media platforms. Discussion of data collection practices, including tracking cookies, user profiling, and targeted advertising. Examination of privacy implications of user-generated content, such as photos, videos, and status updates.	
	2.2	Overview of security threats prevalent in social media environments, including identity theft, phishing attacks, and malware distribution. Analysis of tactics used by cybercriminals to exploit vulnerabilities in social media platforms. Case studies illustrating real-world examples of identity theft, phishing scams, and data breaches on popular social media sites.	
3.0		**Implementing Privacy Protection Strategies**	**6**
3	3.1	Examination of privacy settings and controls available on popular social media platforms, including Facebook, Twitter, and Instagram. Step-by-step guides on accessing and customizing privacy settings to manage visibility of personal information and control data sharing.	
	3.2	Introduction to proactive strategies for minimizing privacy risks in social media environments, such as limiting sharing of personal information and using pseudonyms. Discussion of the role of privacy-enhancing technologies, such as virtual private networks (VPNs) and ad blockers, in protecting online privacy.	
4.0		**Mitigating Security Threats in Social Media**	**8**
4	4.1	Exploration of common tactics used by malicious actors to exploit vulnerabilities in social media platforms, including account takeover, phishing, and social engineering. Case studies illustrating real-world examples of security threats in social media environments and their impact on users.	

Sanjay Ghodawat University, Kolhapur
Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

	4.2	Overview of best practices for securing personal accounts on social media platforms, such as using strong and unique passwords, enabling two-factor authentication (2FA), and regularly updating privacy settings. Guidance on identifying and reporting suspicious activity, such as unauthorized access or suspicious messages.	
	4.3	Strategies for detecting signs of security threats in social media accounts, such as unusual login activity, unrecognized friend requests, or suspicious links. Step-by-step instructions on how to respond to security incidents, including reporting abusive behavior, blocking malicious users, and contacting platform support for assistance.	
5.0		**Promoting Privacy and Security Awareness**	**6**
5	5.1	Discussion on the importance of advocating for privacy-conscious behaviors and responsible digital citizenship in online social networks. Strategies for promoting privacy awareness among peers, family, and broader online communities through education and outreach initiatives.	
	5.2	Exploration of effective communication strategies for raising awareness of privacy and security issues in online communities, including social media groups, forums, and online events. Collaboration with peers to develop and disseminate educational materials, such as infographics, articles, and videos, on privacy and security best practices.	
	5.3	Examination of the role of education and policy initiatives in promoting privacy and security awareness at individual, organizational, and societal levels. Discussion on the importance of advocating for privacy-respecting policies and regulations to protect users' digital rights and mitigate privacy risks in online social media platforms.	

Text Books	
1.	Privacy and Big Data" by Terence Craig and Mary E. Ludloff.
2.	The Privacy Engineer's Manifesto: Getting from Policy to Code to QA to Value by Michelle Dennedy, Jonathan Fox, and Thomas R. Finneran
References	
1.	Privacy in Context: Technology, Policy, and the Integrity of Social Life by Helen Nissenbaum
2.	Data and Goliath: The Hidden Battles to Collect Your Data and Control Your World" by Bruce Schneier
3.	Networks of Control: A Report on Corporate Surveillance, Digital Tracking, Big Data & Privacy" by Wolfie Christl and Sarah Spiekermann

Internal Assessment (T1, T2 and FET)

3. T2 should be based on First to Fourth modules, for 10 marks.

4. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 35 marks comprise of 5 questions, each carrying 7 marks

2. The duration of end semester examination shall be Two hours.

3. The students need to solve all questions.

4. Question No.1 will be compulsory and based on entire syllabus.

5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

*****

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U14MM061	Software Development	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U14MM061	Software Development	10	-	5	15	40%	35	40%	50

Course Description

Software Development is a foundational course in computer engineering that explores understanding of software engineering principles and practices, equipping them with the skills necessary to develop high-quality software solutions. The course covers a range of topics, from software design and development methodologies to testing and maintenance strategies. Through a combination of lectures, hands-on projects, and practical exercises, students will learn how to design, implement, and deploy software systems efficiently and effectively.

Pre-requisites: - Basic understanding of computer systems.

Familiarity with programming concepts and languages.

Course Objectives

- Understand the principles and concepts of software engineering, including software development life cycle models, requirements engineering, and software design methodologies
- Apply software design principles and patterns to develop modular, maintainable, and scalable software systems. Understand the importance of code reusability, abstraction, and encapsulation.
- Learn effective software testing techniques, including unit testing, integration testing, and system testing. Understand the role of testing in ensuring software quality and reliability.
- Develop effective communication and collaboration skills necessary for working in multidisciplinary software development teams. Learn how to communicate technical concepts to non-technical stakeholders and work effectively in agile development environments.
- Understand the ethical and professional responsibilities of software developers, including issues related to privacy, security, and intellectual property rights. Learn how to adhere to ethical guidelines and standards in software development practices.

27

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Identify[2]** different types of Software Engineering Processes and their properties in software development practices
- **CO2** **Describe[2]** the Process Planning, Effort Estimation and Software Configuration Management in software development practices
- **CO3** **Implement[3]** programming Principles and Guidelines in software development practices.
- **CO4** **Implement[3]** testing Fundamentals for a given scenario or requirement**.**
- **CO5** **Analyze[4]** different Testing Techniques software development practices**.**

Course Contents

Module	Unit	Description	Hours
1.0		**Introduction to Software Engineering**	**6**
1	1.1	Types of Software, Software Characteristics, Quality of a Good Software, Software Myths, Software Components, Software Crisis, Software Engineering: Definition, Challenges, Software Engineering Processes, Similarity and Differences from Convential Engineering Processes. s.	
	1.2	Software Development Life Cycle Models: Build and Fix Models, Waterfall Model, Prototyping Model, RAD Model Iterative Enhancement Model, Evolutionary Development Model and Spiral Model, WINWIN Spiral Model, Fourth Generation Technique	
2.0		**Planning a Software**	**6**
2	2.1	Process Planning, Effort Estimation: Uncertainties in Effort Estimation, Building Effort Estimation Models, A Bottom-Up Estimation Approach, COCOMO Model, Project Scheduling & Staffing: Overall Scheduling, Detailed Scheduling, Team Structure,	
	2.2	Software Configuration Management (SCM): - Baselines, Version Control, Change Control & Configuration Audit, Risk Management: Reactive and Proactive Risk Strategies, Software Risks, Risk Analysis, Identification, Projection, Assessment, Monitoring and Managing the Risk, RMMM Plan.	

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

3.0		**Software Requirements Analysis and Specification**	6
3	3.1	Software Requirements Analysis and Specification: Software Requirements: Need for SRS, Requirement Process, Problem Analysis: Informal & formal Approaches, Data Flow Modeling, Object Oriented Modeling, Prototyping, Requirements Specifications: Characteristics of an SRS, Components of SRS, Specification Language, Structure of Requirement Document: IEEE Standards for SRS, Validation, Metrics. Designing and Coding: Designing: Function Oriented Design: Design Principles: Problem Partitioning and Hierarchy, Abstraction, Modularity, Top Down and Bottom-Up Strategies,	
	3.2	Module Level Concepts: Coupling, Cohesion; Structure Design Methodology, Verification, Introduction to Object Oriented Design & User Interface Design, Software Measurement Metrics: Various Size Oriented Measures- Halestead's Software Science, Function Point (FP) Based Measures, Cyclomatic Complexity Measures: Control Flow Graphs.	

4.0		**Coding**	6
4	4.1	Coding: Programming Principles and Guidelines: Common Coding Errors, Structured Programming, Information Hiding, Programming Practices, Coding Standards, Coding Process,	
	4.2	Refactoring, Verification: Code Inspection, Static Analysis, Proving Correctness, Combining Different Techniques, Metrics.	
5.0		**Testing**	6
5	5.1	Testing Fundamentals: Error Fault and Failure, Test Oracles, Test Cases and Test Criteria, Test Case Execution and Analysis, Unit Testing, Integration Testing: : Top Down and Bottom up, Acceptance Testing: Alpha and Beta Testing., Regression Testing, functional and non-functional testing.	
	5.2	Testing Techniques: White Box: Logic Coverage, Path Coverage, Loop Coverage, Data Flow Testing. Black Box Testing: Boundary Value Analysis, Equivalence Class Testing, state Table Based Testing, Decision Table Based Testing.	

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Text Books

1. Software Engineering: A Practitioner's Approach by Roger S. Pressman, McGraw-Hill International edition.
2. An Integrated Approach to Software Engineering, by Pankaj Jalote, Narosa Publishing House.

References

1. Software Engineering by K.K. Agarwal.

2. Software Engineering by Ian Sommerville, Addison-Wesley.

3. Fundamentals of Software Engineering by Rajib Mall, PHI

Internal Assessment (T1 and FET)

1. T1 should be based on First to Fourth modules, for 10 marks.
2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 35 marks comprise of 5 questions, each carrying 7 marks
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

***

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	**Practical**	**Tutorial**	**Theory**	**Practical**	**Tutorial**
U14OE011	Fundamentals of Latex	01	02	-	01	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	**Min pass**	**Marks**	**Min pass**	**Total (Marks)**
U14OE011	Fundamentals of Latex	50	40%	-	-	50

Course Description

This course is at even semester of first year Technology. The main motive is to impart knowledge and understanding about the LaTeX system, explain the procedure of LaTeX typesetting, and familiarize the participants with various document formats of LaTeX, enabling them to prepare articles, thesis, books, and presentations confidently.

Pre-requisites: Microsoft (MS) office.

Course Objectives

- Typesetting of complex mathematical formulae using LaTeX.
- To include figures and tables in a Latex document.
- Use the preamble of LaTeX file to define document class and layout options.
- Gaining hands-on experience in becoming a user of LaTeX

Course Outcomes: After the end of this course students will be able to

- **CO1** **Make use of** [3] Latex programming and commands, sample packages**.**
- **CO2** **Create**[6] well-written short documents and typeset it in LaTex.
- **CO3** **Create**[6] or import graphics into a LaTeX document.
- **CO4** **Create**[6] a simple report for a given technical topic, and typeset it in LaTex

Course Contents

Module	Unit	Description	Hours
1.0		**Introduction**	**7**
1	1.1	Introduction to LaTeX, its installation, different commands and IDEs.	
	1.2	Creating the first document using LaTeX, organizing content into sections using article and book class of LaTeX.	
2.0		**Styling Pages**	**8**
2	2.1	Reviewing different paper sizes, examining packages, formatting the page by setting margins.	
	2.2	Customizing header and footer, changing the page orientation, dividing the document into multiple columns. Reading different types of error messages	
3.0		**Formatting Content**	**7**
3	3.1	Formatting text (styles, size, alignment), adding colours to text and entire page, and	
	3.2	Adding bullets and numbered items, writing complex mathematics. Inserting hyperlink, Inserting References, Inserting the Bibliography Styles	
4.0		**Tables and Images:**	**8**
4	4.1	Creating basic tables, adding simple and dashed borders, merging rows and columns.	
	4.2	Handling situations where a table exceeds the size of a page, adding an image, exploring different properties like rotate, scale.	

Suggested List of Experiments

1. Introduction to LaTeX, Creating and typesetting a simple LaTeX document.
2. Adding basic information to documents, Environments, Footnotes, Sectioning, Displayed material.
3. Accents and symbols; Mathematical typesetting (elementary and advanced): Subscript/ Superscript, Fractions, Roots, Ellipsis.
4. Mathematical symbols, Arrays, Delimiters, Multiline formulas
5. Putting one thing above another, Spacing and changing style in math mode.

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

6. Create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects.

7. Creating a Newsletter: Features to be covered: - Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs.

8. Draft a CV using LaTeX templates.

Text Books

1. Guide to LATEX - UC Davis Mathematics, by H Kopka · 2004

2. The Not So Short Introduction to LaTeX 2E by Tobias Oetiker, Hubert Partl,
    https://cslab.pepperdine.edu/warford/cosc320/lshort.pdf

References

1. The LaTeX Companion Second Edition by Frank Mittelbach and Michel Goossens

2. Guide to LATEX, fourth edition, Helmut Kopka, Patrick W.Daly

Evaluation Scheme

1. TERM WORK assessment must be based on the overall performance of the student with every assignment graded from time to time.

2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.

3. Based on above scheme grading and TERM WORK assessment should be done.

****

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01EM001	Engineering Economics	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		Total (Marks)
		T1	T2	FET	Total	Min pass	Marks	Min pass	
U01EM001	Engineering Economics	-	10	5	15	40%	35	40%	50

Course Description

The course focuses on economic of engineering projects, giving insights on different techniques and methods used on economic feasibility studies relating to design and implementation of engineering projects. The basic purpose of this course is to provide a sound understanding of concepts and principles of engineering economy and to develop proficiency with methods for making rational decisions regarding problems likely to be encountered in professional practice.

Pre-requisites: - mathematics
Course Objectives

- Understand the importance of economy in engineering field.

- Apply knowledge of economic comparisons for selecting best alternative

- Understand the concept of depreciation

- Explain importance of working capital management

- **Course Outcomes:** After the successful completion of the course students will able to:

- **CO1**   **Explain**[2] importance of economy in engineering field..

- **CO2**   **Correlate**[3] knowledge of economy in decision making

- **CO3**   **Correlate**[3] knowledge of deprecation for engineering field

- **CO4**   **Explain**[2] importance of working capital management in business.

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Contents

Module	Unit	Description	Hours
1.0		**Fundamentals Economy**	**06**
1	1.1	Introduction to Engineering Economy, Time value of money, Cash flow, cash flow diagrams, simple Interest and compound Interest, inflation, economic factors.	
2.0		**Comparisons of Alternatives**	**06**
2	2.1	Present worth comparisons, Comparisons of assets with equal, unequal lives, comparison of deferred investments , Equivalent uniform annual cost (EUAC) method , Rate of return method , Future worth method, NPV method	
3.0		**Comparisons of Alternatives**	**06**
3	3.1	Payback period method- conventional and discounted payback period method, Benefit cost ration methods , break even analysis method	
4.0		**Depreciation and Inflation**	**06**
4	4.1	Definition method for calculating depreciation straight line method., constant percentage method, sinking fund method, Switching between different depreciation methods, inflation effect of inflation	
5.0		**working capital management**	**06**
5	5.1	Introduction, need of working capital management, financial ratio, Income statement, Financial statements	

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

References	
1	Leland Blnak, Anthony Tarquin, Engineering Economy , Tata McGraw Hill Publishing Company, New Delhi,
2	Jha, Kumar Neeraj., Construction Project management, Theory & Practice, Pearson Education India, 2015.
3	Panneer Selvam, R, "Engineering Economics", Prentice Hall of India Ltd, New Delhi, 2001
4	Degarmo, E.P., Sullivan, W.G and Canada, J.R, "Engineering Economy", Macmillan, New York, 2011

Internal Assessment (T1, T2 and FET)

3. T2 should be based on First to Fourth modules, for 10 marks.

4. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 35 marks comprise of 5 questions, each carrying 07 marks

2. The duration of end semester examination shall be Two hours.

3. The students need to solve all questions.

4. Question No.1 will be compulsory and based on entire syllabus.

5. Remaining question (Q.2 to Q.5) will be selected from all the modules

****

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U14PC304	Computer Organization & Architecture Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term work	Min pass	Marks	Min pass	Total (Marks)
U14PC304	Computer Organization & Architecture Lab	25	40%	-	-	25

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Demonstrate**[3] use of assembly language programming for 8085 microprocessor by using 8086 TASM/MASM compiler.

- **CO2** **Design** [4]Arithmetic logic units and different types of memory blocks and organization of memory system for extending memory capacity using independent memory chips.

Suggested List of Experiments

All the experiments will be based on the course content of **Computer Organization & Architecture**

U14PC302

1. Introduction to 8086 16-bit Microprocessor (Study Experiment)
2. Programs based on Arithmetic Operations of two 32 bit Numbers of 8086 Microprocessor.
3. Programs based on Logical Operations of 8086 Microprocessor
4. Program based on Branching Operations of 8086 Microprocessor
5. Program based on Conditional CALL and RET of 8086 Microprocessor using Simulator.
6. Program on data transfer from one Block to another block of Memory
7. Program based on interfacing between 8086 Microprocessor and I/O devices for designing interface structure.
8. Program based on Stack and subroutine of 8086 Microprocessor
9. Case study on Designing of a Memory system using Multiple Memory Independent Chips
10. Case study on Demonstration of Parallel Processors using Pipeline architectures

Text Books

1. A. K.Ray , K M Bhurchandi, "Advanced Microprocessor & Peripherals", Tata McGraw Hill,3nd Edition,2013
2. Carl Hamacher, Zvonko Vranesic, Safwat Zaky Computer Organization, McGraw-Hill, Fifth Edition, Reprint 2012
3. John P. Hayes, Computer Architecture and Organization, Tata McGraw Hill, Third Edition, 1998

References

1. William Stallings, Computer Organization and Architecture-Designing for Performance, Pearson Education, Seventh edition, 2006
2. David A. Patterson and John L. Hennessy, "Computer Architecture-A Quantitative Approach", Elsevier, a division of reed India Private Limited, Fifth edition, 2012
3. Douglas V Hall, "Microprocessor & Interfacing: Programming and Hardware", Tata McGraw Hill, 2nd Edition,2006
4. Computer System Architecture - M. Mano

Evaluation Scheme

1. TERM WORK assessment shall be based on the overall performance of the student with every assignment graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

*****

Sanjay Ghodawat University, **Kolhapur**

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	**Practical**	**Tutorial**	**Theory**	**Practical**	**Tutorial**
U14PC305	Object Oriented Programming using C++ Lab	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	**Min pass**	**Marks**	**Min pass**	**Total (Marks)**
U14PC305	Object Oriented Programming using C++ Lab	25	40%	25	40%	50

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Write[2]** compile and debug programs in C++ language.

- **CO2** **Design[4]** programs involving object-oriented concepts for real word problem solving.

List of Experiments

All the experiments will be based on the course content of **Object Oriented Programming using C++**

U14PC303

EXERCISE-1(BASICS)

A. Write a CPP Program to demonstrate the structure of a C++ program.

B. Write a CPP Program to display the names of header files, definitions and list of functions supported.

C. Write a program to show the base of a numeric value of a variable using Hex, Oct and Dec manipulator functions.

D. Write a CPP Program to use of the standard manipulators normally used in the stream classes.

E. Write a CPP Program to demonstrate the usage of bit fields.

F. Write a CPP Program to define constant pointer and pointer to constant and perform possible operations.

G. Write a CPP Program access a variable in different scopes by using scope resolution operator and the use of comma operator.

EXERCISE-2(CLASSES & OBJECTS)

A. Write a CPP Program to swap two numbers using call by value, call by address, call by reference and return by reference.

B. Write a CPP Program to calculate square and cube of a number using inline functions and macros. (Demonstrate the use of inline functions compared to macros).

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

C. Write a CPP Program to find the area of a rectangle, a triangle and surface area of a sphere using function overloading.

D. Write a CPP Program to declare all members of a class as public, Access the members using objects. (Use public, protected, private).

E. Write a CPP Program to access the member functions inside and outside a class.

F. Write a CPP Program to access private data using non-member functions. (Use friend function).

G. Write a CPP Program to pass objects to functions by pass by value method.

H. Write a CPP Program to declare main () function as member function and overload it.

EXERCISE-3(CONSTRUCTORS AND OPERATOR OVER LOADING)

A. Write a CPP Program to show that "for each object constructors is called separately" and read the values through keyboard (Use Constructor).

B. Write a CPP Program to create constructor with arguments and pass the arguments to constructor.

C. Write a CPP Program to create object and release them using destructor.

D. Write a CPP Program to perform addition, subtraction, multiplication of two objects using operator keyword.

E. Write a CPP Program to overload unary and binary operator overloading with friend function.

EXERCISE-4(INHERITANCE AND POLYMORPHISM)

A. Write a CPP Program to derive a class publicly from base class. Declare base class members under public, private and protected.

B. Write a CPP Program to derive single and multiple inheritances.

C. Write a CPP Program to declare virtual base class. Derive a class using two virtual classes.

D. Write a CPP Program to implementation of Virtual Function.

E. Write a CPP Program to Implementation of Pure Virtual Function.

EXERCISE- 5(FILES, TEMPLATES AND EXCEPTION HANDLING)

A. Write a CPP Program to write and read text in a file. Use ofstream and ifstream classes.

B. Write a CPP Program to open a file for writing and reading purpose. Use open () function.

C. Write a CPP Program write text in a file. Read the text from the file from EOF. Display the contents in reverse order.

D. Write a CPP Program to demonstrate that the data is read from file using ASCII format.

E. Write a CPP Program to find the factorial of a number. Throw multiple exceptions and define multiple catch statements to handle exceptions.

F. Write a C++ Program to illustrate template class.

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Text Books

1. E Balagurusamy Object-Oriented Programming with C++.7th edition. McGraw-Hill Publication, ISBN 10: 9352607996 ISBN 13: 9789352607990.

2. Robert Lafore, ― Object-Oriented Programming in C++‖, fourth edition, Sams Publishing, ISBN:0672323087 (ISBN 13: 9780672323089

References

1. Herbert Schildt, ―C++ The complete reference‖, Eighth Edition, McGraw Hill Professional, 2011, ISBN:978-00-72226805

2. Matt Weisfeld, ―The Object-Oriented Thought Process, Third Edition Pearson ISBN-13:075-2063330166.

3. Cox Brad, Andrew J. Novobilski, ―Object –Oriented Programming: An EvolutionaryApproach‖, Second Edition, Addison–Wesley, ISBN:13:978-020-1548341

4. Deitel, "C++ How to Program", 4th Edition, Pearson Education, ISBN:81-297-0276-2

*****

Sanjay Ghodawat University, Kolhapur
Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01VE001	Environmental Sciences	2	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01VE001	Environmental Sciences	10	-	5	15	40%	35	40%	50

Course Description

This course will focus on basic concepts of Environmental components and basic concepts in the field. There will be a discussion about all the environmental conditions, problems, their Solutions, and policies regarding public awareness.

Pre-requisites: -

Course Objectives

- To Study of factors affecting the availability of natural resources, their conservation and management.

- Develop a critical understanding of the environmental issues of concern

- Study of the sectoral effects on the local, regional, and global environmental issues
- Study of the concepts of ecosystems, biodiversity and conservation.

- Study of factors impacting biodiversity loss and ecosystem degradation in India and the world.

- Study of sources of different kinds of pollution and their adverse health impacts.

- Study of the complexity of environmental management

- study of major international institutions and programmes and their role played

Course Outcomes: After the successful completion of the course students will able to:

- **CO1**   **Classify[3]** natural resources and their conditions in local area.

- **CO2**   **Interpret2** local environmental issues

- **CO3**   **Describe[2]** and modify solution on local environmental issues

- **CO4**   **Develop[4]** a critical understanding of the complexity of environmental management.
- **CO5**   **Explaining[2]** local common biodiversity

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Contents

Module	Unit	Description	Hours
1.0		**Humans and the Environment**	**06**
1	1.1	Multidisciplinary nature of environmental studies; Scope and importance UN Conference on Human Environment 1972; World Commission on Environment and Development, the concept of sustainable development	
	1.2	**Natural Resources and Sustainable Development** Land resources and land use change; Land degradation, soil erosion and desertification. Deforestation: Causes and impacts due to mining, dam building on environment and forests. Water: Use and over-exploitation of surface and ground water, floods, droughts. Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, rowing energy needs, case studies	
2.0		**Environmental Issues: Local, Regional and Global**	**06**
2	2.1	Global issues: Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.	
	2.2	**Conservation of Biodiversity and Ecosystems:** • Levels of biological diversity: genetic, species and ecosystem diversity; • Global biodiversity hot spots. India as a mega-biodiversity nation; Endangered and endemic species of India • Threats to biodiversity: Habitat loss, poaching of wildlife, man wildlife conflicts, biological invasions • Conservation of biodiversity In-situ and Ex-situ conservation of biodiversity. • Ecosystem and biodiversity services: Ecological, economic, social, ethical, Aesthetic, and Informational value	
3.0		**Climate Change: Impacts, Adaptation and Mitigation**	**06**

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

3	3.1	Environmental pollution: types, causes, effects and controls; Air, water, Noise pollution · Nuclear hazards and human health risks. Solid waste management: Control measures of urban and industrial waste	
	3.2	Structure of atmosphere; Anthropogenic climate change from greenhouse gas emissions– past, present and future; Mitigation of climate change	
4.0		**Environmental Management**	**06**
4	4.1	· **Environment Laws**: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act Environmental management system: ISO 14001, Environmental audit and impact assessment; Ecolabeling /Ecomark scheme.	
	4.2	**Environmental Treaties and Legislation:** Major International organizations and initiatives: United Nations Environment Programme (UNEP), International Union for Conservation of Nature (IUCN), Intergovernmental Union panel on climate change (IPCC)	
5.0		**working capital management**	**06**
5	5.1	Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan, Bhopal Disaster	
	5.2	Field visits to identify local/regional environmental issues, make observations including data collection and prepare a brief report.	
	5.3	Documentation of campus biodiversity.	

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

	5.4	Campus environmental management activities such as solid waste disposal, water management, and sewage treatment.	

Text Books	
1	Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.
2	Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Rout- ledge.
3	Gleick, P. H. 1993. Water in Crisis. Pacific Institute for Studies in Dev.,Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
4	Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi

References	
1	Harper, Charles L. (2017) Environment and Society, Human Perspectives on environmental Issues 6th Edition. Routledge
2	Jackson, A. R., & Jackson, J. M. (2000). Environmental Science: The Natural Environment and Human Impact. Pearson Education.
3	Pittock, Barrie (2009) Climate Change: The Science, Impacts and Solutions. 2nd Edition. Routledge.
4	Sharma B.K., 2001. Environmental Chemistry. Geol Publ. House, Meerut
5.	Chiras, D. D and Reganold, J. P. (2010). Natural Resource Conservation: Management for a Sustainable Future.10th edition, Upper Saddle River, N. J.Benjamin/Cummins/Pearson.

Internal Assessment (T1, T2 and FET)

   5. T2 should be based on First to Fourth modules, for 10 marks.

   6. FET shall be assessed for 5 marks separately.

End Semester Examination

   6. Question paper will be of 35 marks comprise of 5 questions, each carrying 07 marks

   7. The duration of end semester examination shall be Two hours.

   8. The students need to solve all questions.

   9. Question No.1 will be compulsory and based on entire syllabus.

   10. Remaining question (Q.2 to Q.5) will be selected from all the modules

****

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U14FP001	Field Project I	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U14FP001	Field Project I	25	40%	25	40%	50

Course Description

The objective of this course is to provide second-year engineering students with a solid foundation in statistical analysis and numerical techniques, enabling them to apply these methods effectively in engineering problem-solving and decision-making contexts.

Pre-requisites: U01BS201-Applied Mathematics II.

Course Objectives

- To develop critical thinking and problem solving ability by exploring and proposing solutions to realistic/social problem.
- To emphasizes learning activities that are long-term, inter-disciplinary and student-centric.
- To provide every student the opportunity to get involved either individually or as a group so as to develop team skills and learn professionalism
- To develop an ecosystem this may promote entrepreneurship and research culture among the students.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Solve**[3] real life problems by applying knowledge.

- **CO2** **Analyze**[4] alternative approaches, apply and use most appropriate one for feasible Solution.

- **CO3** **Classify**[4] software applications and identify unique features of various domains.

- **CO4** **Implement**[3] computer engineering skills to meet challenges in the real world, mirroring what professionals do every day.

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Contents

Preamble:

Field Project I is an instructional approach designed to give students the opportunity to develop knowledge and skills through engaging projects set around challenges and problems they may face in the real world. FIELD PROJECT I, is more than just projects. With FIELD PROJECT I students "investigate and respond to an authentic, engaging, and complex problem, or challenge" with deep and sustained attention. FIELD PROJECT I is "learning by doing." The truth is, many in education are recognizing we live in a modern world sustained and advanced through the successful completion of projects. In short, if students are prepared for success in life, we need to prepare them for a project-based world. It is a style of active learning and inquiry-based learning. (Reference: Wikipedia). Project based learning will also redefine the role of teacher as mentor in learning process. Along with communicating knowledge to students, often in a lecture setting, the teacher will also to act as an initiator and facilitator in the collaborative process of knowledge transfer and development. The FIELD PROJECT I model focuses the student on a big open-ended question, challenge, or problem to research and respond to and/or solve. It Brings what students should academically know, understand, and be able to do and requires students to present their problems, research process, methods, and results.

FIELD PROJECT I requires regular mentoring by faculty throughout the semester for successful completion of the idea/project tasks selected by the students per batch. For the faculty involved in FIELD PROJECT I , teaching workload of 4 Hrs/week/batch needs to be considered. The Batch should be divided into sub-groups of 4 to 5 students. Idea implementation /Real life problem/Complex assignments / activities / projects. Under project based learning is to be carried throughout semester and Credit for FIELD PROJECT I has to be awarded on the basis of internal continuous assessment and evaluation at the end of semester

Group Structure:

Working in supervisor/mentor monitored groups; the students plan, manage, and complete a task/project/activity which addresses the stated problem.

1. There should be team/group of 4-5 students

2. A supervisor/mentor teacher assigned to individual groups

Selection of Project/Problem:

The problem-based project oriented model for learning is recommended. The model begins with the identifying of a problem, often growing out of a question or "wondering". This formulated problem then stands as the starting point for learning. Students design and analyze the problem/project within an articulated interdisciplinary or subject frame. A problem can be theoretical, practical, social, technical, symbolic, cultural, and/or scientific and grows out of students' wondering within different disciplines and professional environments.

A chosen problem has to be exemplary. The problem may involve an interdisciplinary approach in both the analysis and solving phases. By exemplarity, a problem needs to refer back to a particular practical, scientific, social and/or technical domain. The problem should stand as one specific example or manifestation of more general learning outcomes related to knowledge and/or modes of inquiry.

There are no commonly shared criteria for what constitutes an acceptable project.

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Projects vary greatly in the depth of the questions explored, the clarity of the learning goals, the content, and structure of the activity.

• A few hands-on activities that may or may not be multidisciplinary.

• Use of technology in meaningful ways to help them investigate, collaborate, analyse, synthesize, and present their learning.

• Activities may include- Solving real life problem, investigation, /study and Writing reports of in depth study, field work.

Assessment:

➢ The institution/head/mentor is committed to assessing and evaluating both student performance and program effectiveness.

➢ Progress of FIELD PROJECT I is monitored regularly on weekly basis. Weekly review of the work is necessary. During process of monitoring and continuous assessment and evaluation of the individual and the team performance is to be measured. FIELD PROJECT I is monitored and continuous assessment is done by supervisor /mentor and authorities.

➢ Students must maintain an institutional culture of authentic collaboration, self-motivation, peer-learning and personal responsibility. The institution/department should support students in this regard through guidance/orientation programs and the provision of appropriate resources and services. Supervisor/mentor and Students must actively participate in assessment and evaluation processes.

➢ Group may demonstrate their knowledge and skills by developing a public product and/or report and/or presentation.

1. Individual assessment for each student (Understanding individual capacity, role and involvement in the project)

2. Group assessment (roles defined, distribution of work, intra-team communication and togetherness)

3. Documentation and presentation

Evaluation and Continuous Assessment:

It is recommended that all activities should to be recorded regularly, regular assessment of work need to be done and proper documents need to be maintained at college end by both students as well as mentor (FIELD PROJECT I work book).Continuous Assessment Sheet (CAS) is to be maintained by all mentors/department and institutes.

Recommended parameters for assessment/evaluation and weightage:

1. Idea Inception and Awareness /Consideration of -Environment/ Social /Ethics/ Safety measures/Legal aspects (10%)

2. Outcomes of FIELD PROJECT I/ Problem Solving Skills/ Solution provided/ Final product (Individual assessment and team assessment) (40%)

3. Documentation (Gathering requirements, design &modelling, implementation/execution, use of technology and final report, other documents) (15%)

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Text Books:

1. A new model of problem based learning. By Terry Barrett. All Ireland Society for higher education (AISHE). ISBN:978-0-9935254-6-9; 2017

2. Problem Based Learning. byMahnazmoallem, woei hung and Nada Dabbagh, Wiley Publishers. 2019.

3. Stem Project based learning and integrated science, Technology, Engineering and mathematics approach. By Robert RobartCapraro, Mary MargaretCapraro

Reference Books:

1. De Graaff E, Kolmos A., red.: Management of change: Implementation of problem-based and project-based learning in engineering. Rotterdam: Sense Publishers. 2007.

2. Project management core text book, 2 Indian Edition , by Gopalan.

3. The Art of Agile Development. By James Shore & Shane Warden

Evaluation Scheme

1. TERM WORK assessment must be based on the overall performance of the student with every assignment done on computer graded from time to time.

2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.

3. Based on above scheme grading and TERM WORK assessment should be done.

*****

Programme structure for B. Tech. Computer Science and Engineering
Second Year Computer Science and Engineering Programs Semester IV: Teaching Scheme

Course code	Course Name	Teaching scheme (Hrs/week)			Credits assigned			Total credits
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	
U14PC401	Data Structure	3	-	-	3	-	-	3
U14PC402	Operating System	3	-	-	3	-	-	3
U14PC403	Database Management System	2	-	-	2	-	-	2
U14MM0XX	Multidisciplinary Minor II	2	-	-	2	-	-	2
U14OE02XX	Open Elective II	2	-	-	2	-	-	2
U01EM002	Engineering Management	2	-	-	2	-	-	2
U14VS401	Software Proficiency I (Java Programming)	-	4	-	-	2	-	2
U14PC404	Data Structure Lab	-	2	-	-	1	-	1
U14PC405	Database Management System Laboratory	-	2	-	-	1	-	1
U03AE002 U03AE003	Modern Indian Language – Hindi OR Modern Indian Language – Sanskrit	2	-	-	2	-	-	2
U03VE003	Universal Human Values II	2	-	-	2	-	-	2
	Total	18	8		18	4		22

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Second Year Computer Science and Engineering Programs Semester IV: Evaluation Scheme

Course code	Course Name	Theory Marks					Practical Marks		Total
		Internal Assessment				ESE	Term work	Practical Oral /POE	
		T1	T2	FET	Total				
U14PC401	Data Structure	10	10	5	25	50	-	-	75
U14PC402	Operating System	10	10	5	25	50	-	-	75
U14PC403	Database Management System	10	10	5	25	50	-	-	75
U14MM0XX	Multidisciplinary Minor II	10	-	5	15	35	-	-	50
U14OE02XX	Open Elective II	10	-	5	15	35	-	-	50
U01EM002	Engineering Management	10	-	5	15	35	-	-	50
U14VS401	Software Proficiency I (Java Programming)	-	-	-	-	-	25	25	50
U14PC404	Data Structure Lab	-	-	-	-	-	25	-	25
U14PC405	Database Management System Laboratory	-	-	-	-	-	25	-	25
U14AE401 U14AE402	Modern Indian Language – Hindi OR Modern Indian Language – Sanskrit	10	-	5	15	35	-	-	50
U03VE401	Universal Human Values II	10	-	5	15	35	-	-	50

* Minimum passing is 40% for all courses and evaluation head mentioned above. FET – Faculty evaluation for Theory, T1, T2, Continuous Assessment Test, Term Work, ESE - End Semester Examination, P/F – Pass/ Fail Course, AU – Audit Course

Exit Option:
o   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.
o   Students exiting the Second Year Programme after securing minimum 80credits will be awarded UG Diploma in the relevant Discipline /Subject provided they secure additional 8 credits in skill-based vocational courses   (skill-based courses, internship, mini projects etc) offered during summer vacation after the second year.

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Programmer structure for B. Tech. Computer Science and Engineering Multi-Disciplinary Minor for Technology

Track 1:

		Multidisciplinary Minor in Networking		
Minor	Sr. No	Code	Title of the Course	Credits
II	2.	U14MM012	Linux and Shell Programming	2

Track 2:

		Track 2: Multidisciplinary Minor in DATA SCIENCE		
Minor	Sr. No	Code	Title of the Course	Credits
II	2.	U14MM022	Python for Data Science	2

Track 3:

		Track 3: Multidisciplinary Minor in CYBER SECURITY		
Minor	Sr. No	Code	Title of the Course	Credits
II	2.	U14MM022	Computer Networks and Internet Protocol	2

2. Programmer structure for B. Tech. Computer Science and Engineering Multi-Disciplinary Minor for University

		Multidisciplinary Minor in Software Development		
Minor	Sr. No	Code	Title of the Course	Credits
II	1	U14MM062	Object Oriented Modelling and Design	3
	2	U14MM066	Object Oriented Modelling and Design Lab	1

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

○

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
U14PC401	Data Structure	**Theory**	**Practical**	**Tutorial**	**Theory**	**Practical**	**Tutorial**
		03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	**T2**	**FET**	**Total**	**Min pass**	**Marks**	**Min pass**	**Total (Marks)**
U14PC401	Data Structure	10	10	5	25	40%	50	40%	75

Course Description

The Data Structures course provides students with a foundational understanding of organizing and managing data efficiently in computer systems. Students will explore various data structures and algorithms used to store, retrieve, and manipulate data, gaining insight into their strengths, weaknesses, and applications. Through a combination of theoretical concepts and practical implementations, students will develop the skills necessary to analyze problems and design efficient data structures and algorithms for solving them.

Pre-requisites: U14PC303- Object Oriented Programming using C++.

Course Objectives

- To learn the principles behind the implementation, operation, and manipulation of each data structure.
- To develop the ability to analyze the time and space complexity of algorithms associated with various data structures.
- To solve a variety of problems using data structure concepts, including sorting, searching, traversal, and manipulation.
- To develop skills in designing efficient algorithms and data structures that can be scaled and optimized for large-scale software projects.

Course Outcomes: After the end of this course students will be able to

- **CO1** **Describe[2]** fundamentals in data structures for solving problems using a programming language.

- **CO2** **Explain[2]** the fundamental concepts of structuring, managing and organizing the data for solving problems using linear data structures with ADTs.

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

- **CO3** **Explain[2]** the fundamental concepts of structuring, managing and organizing the data for solving problems using non-linear data structures with ADTs.

- **CO4** **Apply[3]** appropriate non-linear data structure to solve the problem using a programming language.

- **CO5** **Compare[4]** different data structure algorithms and searching, sorting methods for solving problems using complexity methods.

Course Contents

Module	Unit	Description	Hours
1.0		**Basics of Data Structures**	**9**
1	1.1	Introduction: Data and Information, Data Structure, Classification of Data Structures, Primitive Data Types, Abstract Data Types, Data structure vs. File Organization, Operations on Data Structure, Algorithm, Importance of Algorithm Analysis, Complexity of an Algorithm, Asymptotic Analysis and Notations, Big O Notation, Big Omega Notation, Big Theta Notation, Rate of Growth and Big O Notation.	
	1.2	Array: Introduction, One Dimensional Array, Memory Representation of One Dimensional Array, Traversing, Insertion, Deletion, Searching, Sorting, Merging of Arrays, Multidimensional Arrays, Memory Representation of Two Dimensional Arrays, General Multi-Dimensional Arrays, Sparse Arrays, Sparse Matrix, Memory Representation of Special kind of Matrices, Advantages and Limitations of Arrays.	
2.0		**Linked List**	**9**
2	2.1	Linked List, One-way Linked List, Traversal of Linked List, Searching, Memory Allocation and De-allocation, Insertion in Linked List, Deletion from Linked List, Copying a List into Other List, Merging Two Linked Lists, Splitting a List into Two Lists, Reversing One way linked List, Circular Linked List, Applications of Circular Linked List	
	2.2	Two way Linked List, Traversing a Two way Linked List, Searching in a Two way linked List, Insertion of an element in Two way Linked List, Deleting a node from Two way Linked List, Header Linked List	
	2.3	Applications of the Linked list, Representation of Polynomials, Storage of Sparse Arrays, Implementing other Data Structures.	

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

3.0		**Stack and Queue**	9
3	3.1	Stack: Introduction, Operations on the Stack Memory Representation of Stack, Array Representation of Stack, Applications of Stack, Evaluation of Arithmetic Expression, Matching Parenthesis, infix and postfix operations, Recursion.	
	3.2	Queue: Introduction, Queue, Operations on the Queue, Memory Representation of Queue, Array representation of queue, Linked List Representation of Queue, Circular Queue, Some special kinds of queues, Deque, Priority Queue, Application of Priority Queue, Applications of Queues.	

4.0		**Searching and Hashing**	9
4	4.1	Bubble, Selection, Insertion, Merge Sort. Heap, Memory Representation of Heap, Operation on Heap, Heap Sort. Searching: Sequential, Binary, Indexed Sequential Searches, Binary Search.	
	4.2	Hash function, Address calculation techniques, Common hashing functions Collision resolution, Linear probing, Quadratic, Double hashing, Bucket hashing, Deletion and rehashing.	

5.0		**Nonlinear Data Structure**	9
5	5.1	Tree: Tree, Binary Tree, Properties of Binary Tree, Memory Representation of Binary Tree, Operations Performed on Binary Tree, Reconstruction of Binary Tree from its Traversals, Huffman Algorithm, Binary Search Tree, Operations on Binary Search Tree, Advanced Tree Structures: Red Black Tree, Operations Performed on Red Black Tree, AVL Tree, Operations performed on AVL Tree, 2- 3 Tree, B-Tree.	
	5.2	Graph: Introduction, Graph, Graph Terminology, Memory Representation of Graph, Adjacency Matrix Representation of Graph, Adjacency List or Linked Representation of Graph, Operations Performed on Graph, Graph Traversal, Applications of the Graph, Reachability, Shortest Path Problems, Spanning Trees.	

Text Books

1. Data Structures- A Pseudocode Approach with C by Richard F. Gilberg and Behrouz A.Forouzon , Cengage Learning ,2 edition ,2004.
2. Data Structures with C Schaum's Outlines Series by S. Lipschutz Tata McGraw-Hil, 2017.

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

3. Data Structure using C by Reema Thareia, Oxford, 2 edition ,2014.

References

1. Data Structure using C A. M. Tanenbaum,Y. Langsam, M.J. Augenstein Prentice- Hall Of India Pvt. Limited 2003

2. Understanding Pointers in C Yashavant Kanetkar BPB Publication I 2009

Internal Assessment (T1, T2 and FET)

3. T1 (Test 1) should be based on first two modules and T2 (Test 2) should be based on next two modules, for 10 marks each.

4. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.

2. The duration of end semester examination shall be Two hours.

3. The students need to solve all 5 questions.

4. Question No.1 will be compulsory and based on entire syllabus.

5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

****

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U14PC402	Operating System	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U14PC402	Operating System	10	10	5	25	40%	50	40%	75

Course Description

The Operating Systems course introduces second-year computer engineering students to the fundamental concepts, principles, and functionalities of operating systems. Operating systems serve as the bridge between computer hardware and software applications, managing system resources and providing a user-friendly interface for efficient interaction with the computer. This course covers topics such as process management, memory management, file systems, device management, and security. Through lectures, practical exercises, and hands-on projects, students will gain a comprehensive understanding of how operating systems work and how they impact the performance and usability of computer systems.

Pre-requisites: U14PC302- Computer Organization & Architecture.

Course Objectives

- To Gain a solid understanding of the fundamental principles and components of operating systems, including process management, memory management, file systems, and device management.

- To apply theoretical knowledge to practical scenarios through hands-on exercises and projects, developing proficiency in implementing basic operating system functionalities using relevant programming languages and tools

- To Develop problem-solving skills by analyzing and resolving issues related to process scheduling, memory allocation, file management, and device I/O operations within operating system environments.

- To understand the challenges of concurrent execution and synchronization in operating systems, and learn to implement synchronization mechanisms to prevent race conditions and deadlocks.

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Explain[2]** basic concepts of operating system and their structures to compare various operating systems using various OS parameters.

- **CO2** **Analyze[4]** issues related to process scheduling and resource management with the help of different scheduling algorithm.

- **CO3** **Develop[4]** appropriate solution to solve critical section problem by using accurate operating system algorithm.

- **CO4** **Use[3]** deadlock handling and Memory management techniques with suitable method to handle a deadlock and memory management.

- **CO5** **Explain[4]** concepts of file handling and I/O subsystem for accessing a file as well as I/O devices using file and I/O controller.

Course Contents

Module	Unit	Description	Hours
1.0		**Overview**	**9**
1	1.1	Introduction to Operating Systems, Operating System structure, Types of Operating Systems, Operating System Services, Views of Operating System	
	1.2	System calls, Types of system Calls, System programs, Kernel-Types of kernel, Overview of Linux and Android OS	
2.0		**Process Management**	**9**
2	2.1	Process concept: Basic concepts, Process States, Process Control Block, Context switch, Operations on processes, Inter-process communication, Threads	
	2.2	Process Scheduling: Scheduling criteria, Types of Scheduler, Scheduling algorithms, Multiple-Processor scheduling, Multilevel Queue Scheduling, Multilevel Feedback Queue Scheduling	

3.0		Process Synchronization	9
3	3.1	Background, the critical section problem, Peterson's solution, synchronization hardware,	
	3.2	Semaphores, classic problems of Synchronization, Monitor	
4.0		**Deadlock**	9
4	4.1	System model, deadlock characterization, methods for handling deadlocks,	
	4.2	Deadlock preventions, deadlock avoidance, deadlock detection, deadlock recovery.	
5.0		**Memory Management and Storage Management& I/O Subsystem**	9
5	5.1	Memory Management Strategies: Background, swapping, contiguous memory allocation, paging, structure of the page table, Segmentation. Virtual Memory Management: Background, demand paging, copy-on-write, page replacement, Thrashing	
	5.2	File System: File concept, access methods, Directory and disk structure, Disk Scheduling, file-system mounting, file sharing, protection, Overview of I/O system, I/O hardware, Application I/O interface, Kernel I/O subsystem.	

Text Books

1. Operating System Concepts Gagne Silberschatz, Galvin,John Wiley 9 edition 2009
2. Operating Systems - A Concept Based approach Dhananjay M Dhamdhere Tata McGraw Hill 4 edition 2007.
3. Operating Systems: Principles and Practice Thomas Anderson and Michael Dahlin Recursive Books 2 edition.

References

1. Operating System A Design Oriented Approach Charles Crowley Tata McGraw Hill 3 edition .
2. Operating System with Case Studies in Unix, Netware and Windows NT Achyut S. Godbole Tata

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

	McGraw Hill 5 edition 2007.
3.	Operating Systems: Internals and Design Principles William Stallings Pearson Education International 8 edition 2014
.	Ubuntu: The Complete Reference Richard Petersen McGraw-Hill Education 1 edition 2008.

Internal Assessment (T1, T2 and FET)

1. T1 should be based on first two modules and T2 should be based on next two modules, for 10 marks each.

2. FET shall be assessed for 5 marks separately..

End Semester Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.

2. The duration of end semester examination shall be Two hours.

3. The students need to solve all 5 questions.

4. Question No.1 will be compulsory and based on entire syllabus.

5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

*****

Sanjay Ghodawat University , Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U14PC403	Database Management System	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U14PC403	Database Management System	10	10	5	25	40%	50	40%	75

Course Description

This course provides second-year computer engineering students with a comprehensive understanding of Database Management Systems (DBMS). Through theoretical lectures and practical exercises, students will learn the fundamental concepts, principles, and techniques used in the design, implementation, and management of databases.

Pre-requisites: Basics of programming C and C++.

Course Objectives:

- To Understand the fundamental concepts of database management systems (DBMS) including data models, schemas, and database architectures.

- To Gain proficiency in relational data modelling techniques, including entity-relationship (ER) modelling, and apply normalization principles to design efficient and scalable databasesTo provide students with the basic knowledge of quantum physics .

- To Develop practical skills in using Structured Query Language (SQL) for database querying, data definition, manipulation, and optimization.

- To Explore advanced database concepts such as transaction management, concurrency control, and data integrity mechanisms to ensure reliable and secure data management

Course Outcomes: After the successful completion of the course students will able to:

- **CO1**   **Design[4]** an ER diagram and relational schema to solve given problem using integrity constraints and normalization techniques.

- **CO2**   **Apply[3]** the concepts of database system, conceptual database design, relational algebra, SQL, normalization to solve the given problems through designing the database.

- **CO3**   **Apply[3]** concepts transaction processing and concurrency control to improve the security and system performance using transaction management, concurrency control and recovery techniques

- **CO4**   **Demonstrate[3]** concepts of indexing, concurrency protocols and recovery algorithms to solve real world problems using DBMS concepts.

- **CO5**   **Formulate[6]** the queries to perform the create, delete, extract and update operations on the database using structured query language.

Course Contents

Module	Unit	Description	Hours
1.0		**Introduction to databases and ER Model**	**6**
1	1.1	Introduction: General introduction to database systems, its advantages and applications, View of Database – Levels of data abstraction, Data models, Database languages, Database System Architecture, Database users and Administrator	
	1.2	ER Model: Entity set, Entity types, attributes, Notations, Relationship sets, Relationship types, Keys- super key, candidate key, primary key, Extended Features of ER Model-Generalization, Specialization and aggregation	
2.0		**Relational Model and SQL Relational Model**	**9**
2	2.1	Structure of Relational Database, Reduction of ER model into Relational schemas, Schema-instance distinction, Referential integrity and foreign keys, Pure languages, Relational algebra, Example queries	
	2.2	SQL: Introduction to SQL, Data definition statements with constraints, Insert, Update and Delete, Set Operations, Aggregate functions group by and having clauses, Nested Queries, Views, Complex Queries, Joins.	
3.0		**Functional Dependency and Normalization**	**9**
3	3.1	Importance of a good schema design, Motivation for normal forms, Atomic domains and1NF, Dependency theory - functional dependencies, Closure of a set of FD's,	
	3.2	Definitions of 2NF, 3NF and BCNF, Decomposition algorithms and desirable	

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

		properties of them, Multivalued dependencies and 4NF, Join dependencies and Definition of 5NF.	
4.0		**Data Storage & Indexing**	**9**
4	4.1	File organization, Organization of records in files, Data Dictionary, Database Buffer	
	4.2	Indexing: Concept, Ordered Indices-Primary, Secondary, Multilevel, B+ Tree Index, Hashing, Hash Indices, Dynamic hashing, Multiple key access, Bitmap Indices	
5.0		**Transaction Management & Concurrency Control**	**9**
5	5.1	Transaction Processing: Concept, ACID properties, Transaction states, Storage Structure, Implementation of atomicity, isolation and durability, Serializability, Testing of Serializability.	
	5.2	Concurrency Control: Lock-based protocols, Timestamp - based Protocols, Validation -based Protocols, Multiple Granularities, Deadlock handling.	

Text Books

1. A Database system concepts A. Silberschatz, H.F. Korth, S.Sudarsha McGraw Hill Education 6 edition 2011.

2. Database Systems- A practical approach to Design, Implementation Thomos Connolly, Carolyn Begg Pearson Education. 4 edition 2009

3. Database Systems – Design, Implementation and Management Rob & Coronel Thomson Course Technology 5 edition 2008

4. Database Management Systems Raghu Ram Krishnan McGraw Hill 3edition 2002.

References

1. Fundamentals of Database Systems Ramez Elmasri and Shamkant Navathe Pearson Education 4 edition 2007.

2. Systems: Design, Implementation and management Peter Rof, Carlos Coronel Cengage Learning 7 edition 2014.

3. Principles of Database Systems J. D. Ullman Galgotia publications 1 edition 2011

4. SQL: A Complete Reference Alexis Leon, Mathews Leon McGraw Hill Education 1 edition 2002

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Internal Assessment (T1, T2 and FET)

1. T1 should be based on first two modules and T2 should be based on next two modules, for 10 marks each.

2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.

2. The duration of end semester examination shall be Two hours.

3. The students need to solve all 5 questions.

4. Question No.1 will be compulsory and based on entire syllabus.

5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

*****

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	**Practical**	**Tutorial**	**Theory**	**Practical**	**Tutorial**
U14MM012	Linux and Shell Programming	02	--	-	02	--	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	**T2**	**FET**	**Total**	**Min pass**	**Marks**	**Min pass**	**Total (Marks)**
U14MM012	Linux and Shell Programming	10	-	5	15	40%	35	40%	50

Course Description

This course offers second-year computer engineering students a comprehensive understanding of the Linux operating system and shell programming. It equips students with the necessary skills to navigate the Linux environment efficiently, automate tasks using shell scripts, and perform system administration duties.

Pre-requisites: Basics of computer system.

Course Objectives:

- To familiarize students with the Linux operating system environment, including its architecture, file system structure, and command-line interface.
- To learn how to write, execute, and debug shell scripts for automating repetitive tasks and system administration.
- To understand file permissions and ownerships, and how to manage them effectively for security purposes.
- To Gain proficiency in text processing utilities and regular expressions for data manipulation and analysis.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1**   **Describe[2]** the architecture and features of UNIX Operating System and distinguish it from other Operating System
- **CO2**   **Demonstrate[3]** UNIX commands for file handling and process control
- **CO3**   **Write[2]** Regular expressions for pattern matching and apply them to various filters for a specific task
- **CO4**   **Analyze[4]** a given problem and apply requisite facets of SHELL programming in order to devise a SHELL script to solve the problem

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Contents

Module	Unit	Description	Hours
1.0		**Introduction**	**6**
1	1.1	Introduction to Unix-Brief History-What is Unix-Unix Components-Using Unix-Commands in Unix-Some	
	1.2	Basic Commands-Command Substitution-Giving Multiple Commands.	
2.0		**File system**	**6**
2	2.1	The File system –The Basics of Files-What's in a File-Directories and File Names-Permissions- INodes-The Directory Hierarchy,	
	2.2	File Attributes and Permissions-The File Command knowing the File Type-The Chmod Command Changing File Permissions-The Chown Command Changing the Owner of a File-The Chgrp Command Changing the Group of a File.	
3.0		**Shell-Command**	**6**
3	3.1	Using the Shell-Command Line Structure-Met characters-Creating New Commands-Command Arguments	
	3.2	Parameters-Program Output as Arguments-Shell Variables- -More on I/O Redirection-Looping in Shell Programs.	
4.0		**Filters**	**6**
4	4.1	Filters-The Grep Family-Other Filters-The Stream Editor Sed-The AWK Pattern Scanning and	
	4.2	Processing Language-Good Files and Good Filters.	
5.0		**Shell Programming**	**6**
5	5.1	Shell Variables-The Export Command-The Profile File a Script Run During Starting-The First Shell Script-The read Command-Positional parameters-The $? Variable knowing the exit Status-More about the Set Command-The Exit Command-Branching Control Structures-Loop Control Structures-The Continue and Break Statement	
	5.2	The Expr Command: Performing Integer Arithmetic-Real Arithmetic in Shell Programs-The here Document(<<)-The Sleep Command-Debugging Scripts-The Script Command-The Eval Command-The Exec Command.	
	5.3	The Process-The Meaning-Parent and Child Processes-Types of Processes-More about Foreground and Background processes-Internal and External Commands-Process Creation-The Trap Command-The Stty Command-The Kill Command-Job Control	

Sanjay Ghodawat University, Kolhapur
Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Text Books

1. The Unix programming Environment by Brain W. Kernighan & Rob Pike, Pearson.

2. Introduction to Unix Shell Programming by M.G.Venkateshmurthy, Pearson..

References

1. Unix and shell programming by B.M. Harwani, OXFORD university press..

ONLINE REFERENCES:

1. https://www.geeksforgeeks.org/introduction-linux-shell-shell-scripting/

2. https://www.tutorialspoint.com/unix/shell_scripting.htm

3. https://www.shellscript.sh/first.html

Internal Assessment (T1, T2 and FET)

5. T2 should be based on First to Fourth modules, for 10 marks.

6. FET shall be assessed for 5 marks separately.

End Semester Examination

6. Question paper will be of 35 marks comprise of 5 questions, each carrying 7 marks

7. The duration of end semester examination shall be Two hours.

8. The students need to solve all questions.

9. Question No.1 will be compulsory and based on entire syllabus.

10. Remaining question (Q.2 to Q.5) will be selected from all the modules.

*****

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U14MM022	Python for Data Science	02	00	-	02	--	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U14MM022	Python for Data Science	10	-	5	15	40%	35	40%	50

Course Description

This course includes examples of analytics in a wide variety of industries, and students will learn how you can use analytics in their career and life. One of the most important aspects of this course is that you, the student, are getting hands-on experience creating analytics models.

Pre-requisites: The Joy of Computing using Python.

Course Objectives:

- Learn the syntax and semantics of Python Programming Language.
- Apply various data types and control structure
- Understand class inheritance and polymorphism
- Understand the object-oriented program design and development

Course Outcomes: After the successful completion of the course students will able to:

• **CO1**	Write Python functions to facilitate code reuse and manipulate strings**.**
• **CO2**	Illustrate the process of structuring the data using lists, tuples and dictionaries.
• **CO3**	Demonstrate the use of built-in functions to navigate the file system.
• **CO4**	Appraise the need for working on web scraping.

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Contents

Module	Unit	Description	Hours
1.0		**Data Structures and OOP**	**6**
1	1.1	Python Program Execution Procedure – Statements – Expressions – Flow of Controls –Functions – Numeric Data Types – Sequences – Strings – Tuples – Lists – Dictionaries.	
	1.2	Class – Constructors – Object Creation – Inheritance – Overloading. Text Files and Binary Files – Reading and Writing.	
2.0		**Numpy and Pandas Packages**	**6**
2	2.1	NumPy ndarray - Vectorization Operation - Array Indexing and Slicing - Transposing Array and Swapping Axes - Saving and Loading Array - Universal Functions - Mathematical and Statistical Functions in Numpy .	
	2.2	Series and DataFrame data structures in pandas - Creation of Data Frames – Accessing the columns in a DataFrame - Accessing the rows in a DataFrame - Panda's Index Objects - Reindexing Series and DataFrames - Dropping entries from Series and Data Frames - Indexing, Selection and Filtering in Series and Data Frames - Arithmetic Operations between Data Frames and Series - Function Application and Mapping.	
3.0		**Data Wrangling**	**6**
3	3	Combining and Merging Data Sets – Reshaping and Pivoting – Data Transformation – String manipulations – Regular Expressions.	
4.0		**Data Aggregation and Group Operations**	**8**
4	4.1	GroupBy Mechanics – Data Aggregation – GroupWise Operations –.	
	4.2	Transformations – Pivot Tables – Cross Tabulations – Date and Time data types	
5.0		**Visualization in Python**	**6**
5	5.1	Matplotlib and Seaborn Packages – Plotting Graph - Controlling Graphs – Adding Text – More Graph Types – Getting and Setting Values – Patches.	

Text Books	
1.	Al Sweigart, "Automate the Boring Stuff with Python", William Pollock, 2015.

References

1.	Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd Edition, Green Tea Press, 2015.
2.	Charles Dierbach, "Introduction to Computer Science Using Python", 1st Edition, Wiley India Pvt Ltd.
3.	Wesley J Chun, "Core Python Applications Programming", 3rd Edition, Pearson Education India, 2015
4.	Roberto Tamassia, Michael H Goldwasser, Michael T Goodrich, "Data Structures and Algorithms in Python", 1st Edition, Wiley India Pvt Ltd

Internal Assessment (T1, T2 and FET)

7. T2 should be based on First to Fourth modules, for 10 marks.

8. FET shall be assessed for 5 marks separately.

End Semester Examination

11. Question paper will be of 35 marks comprise of 5 questions, each carrying 7 marks

12. The duration of end semester examination shall be Two hours.

13. The students need to solve all questions.

14. Question No.1 will be compulsory and based on entire syllabus.

15. Remaining question (Q.2 to Q.5) will be selected from all the modules.

*****

Sanjay Ghodawat University, **Kolhapur**

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U14MM062	Object Oriented Modelling and Design	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U14MM062	Object Oriented Modelling and Design	10	10	5	25	40%	50	40%	75

Course Description

This course provides second-year computer engineering students with a comprehensive understanding of object-oriented modelling and design principles. Students will learn how to apply these principles to analyze, design, and implement software systems using object-oriented methodologies and techniques.

Pre-requisites: - Basics of computer system and programming

Course Objectives

- To understanding key concepts such as classes, objects, encapsulation, inheritance, and polymorphism.

- To earning various UML diagrams including class diagrams, object diagrams, use case diagrams, sequence diagrams, and state diagrams

- To Understanding when and how to apply design patterns to solve recurring design problems effectively

- To introduce software tools and platforms for object-oriented modeling and design, such as UML modeling tools and IDEs

Course Outcomes: After the successful completion of the course students will able to:

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

- **CO1** **Apply[3]** object oriented modelling and design concepts to solve given problem using Rational Rose design tool.
- **CO2** **Design[4]** different data flow diagrams for given problem statement by using Rational Rose design tool.
- **CO3** **Sketch[3]** System design for given real time system using designing object oriented concepts.
- **CO4** **Design[4]** different UML diagrams for given problem statement by using STAR IIML design tool.

Course Contents

Module	Unit	Description	Hours
1.0		**Introduction**	**6**
1	1.1	Modeling as a design technique, Objects, classes, links and associations, Generalization..	
	1.2	Inheritance, Aggregation, abstract classes, generalization as extension and restriction, and multiple inheritances.	
2.0		**Dynamic & Functional Modeling**	**6**
2	2.1	Events and states, operations, nested state diagrams, concurrency advanced dynamic modeling concepts, relation of object and dynamic models,	
	2.2	Data Flow Diagrams, relation of functional to object and dynamic models	
3.0		**Design Methodology**	**6**
3	3.1	OMT methodology, Impact of an object oriented approach, Analysis Overview, System design with examples, Object Design, combining the three models,	
	3.2	Designing Algorithms, design association and physical packaging, design Optimization, implementation of Controls, desi gr association.	
4.0		**Structural Modeling using UML**	**6**
4	4.1	Classes, Relationships, Common mechanisms, Diagrams, Class Diagrams, Interfaces, Types and Roles, Packages, instances and Object Diagram	

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

	4.2	Use cases, Use case diagram, Interaction Diagrams and Activity diagrams, Events and signals, State Machines, Process and Threads, Time & Space, State chart diagrams.	
5.0		**Architectural Modeling**	**6**
5	5.1	Components, Deployment, Collaboration,	
	5.2	Patterns& frameworks Component Diagrams, Deployment Diagrams.	

Text Books

1. Erich Gamma, Richard Helm, Ralph Johnson and john Vlissides: Design Patterns – Elements of Reusable Object-Oriented Software, Pearson Education,2007

2. Michael Blaha, James Rumbaugh: Object Oriented Modelling and Design with UML,2nd Edition, Pearson Education,2005

References

1. Grady Booch et.al.: Object-Oriented Analysis and Design with Applications,3rd Edition, Pearson Education,2007.

2. Booch, Jacobson, Rambaugh : Object-Oriented Analysis and Design with Applications, 3rd edition, Pearson, Reprint 2013

Internal Assessment (T1, T2 and FET)

1. T1 should be based on first two modules and T2 should be based on next two modules, for 10 marks each.
2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

*****

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U14OE021	Advance Microsoft Office	01	02	-	01	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U14OE021	Advance Microsoft Office	50	40%	-	-	50

Course Description

This course is at even semester of first year Technology. Microsoft office is a powerful suite of tools that can help professionals stay organized, collaborate with colleagues, and create professional documents. From creating reports and proposals to analysing data in Excel to managing email and scheduling in Outlook, Microsoft has something for every professional.it

Helps to learn Microsoft word from beginner to expert level. Learn to create a professional document template

Pre-requisites: Computer Basics

Course Objectives

- To know how to use the most common Microsoft office programs..
- To be able to create documents for printing and sharing.
- To be able to create and share presentations.
- Gaining hands-on experience in becoming a user of Microsoft office

Course Outcomes: After the end of this course students will be able to

- **CO1 Creating**[6] and formatting simple documents**.**
- **CO2 Creating**[6] simple reports using charts and graphs.
- **CO3 Creating**[6] dynamic and engaging presentations with animations and transitions.
- **CO4 Create**[6] a simple report for a given technical topic, and typeset it in Microsoft office

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Contents

Module	Unit	Description	Hours
1.0		**Word Processing Package**	**7**
1	1.1	Introduction-Features- Word User Interface Elements- Creating New Documents- Basic Editing-Saving a Document-Printing a Document- Print Preview-Page Orientation Viewing Documents-Setting. Tabs-Page Margins- Indents- Ruler- Formatting Techniques Font Formatting-Paragraph Formatting- Page Setup- Headers &Footers-Bullet.	
	1.2	Numbered List Borders and Shading- Find and Replace-Page Break Page Numbers-Mail Merging-Spelling and Grammar Checking- Thesaurus- Macros- Tables- Side By-Side and Nested Tables- Formatting Tables- Drawing- Word art- Paint Brush	
2.0		**Spreadsheet Package**	**8**
2	2.1	Introduction-Excel User Inter face Working With Cell and Cell Addresses- Selecting a Range, Moving, Cutting, Copying With Paste-Inserting and Deleting Workbook- Cells- Freezing Renaming Cells- a Worksheet- Adding, Deleting Cell, Contents Height Selecting Using and Copying Borders- / Width-Formatting in Print a Worksheet Cell- Boxes Area-Margin Using and Colours- Within Print a Worksheet and Preview- Fonts-	
	2.2	Cantering Orientation- Automatically- Aligning-Wrapping Preparing a Heading, Cantering Worksheet Insert a and Worksheet- Comments- for Rotating Row/ the Column Printer-Using Clear Text Formatting Options- Formatting Changing Header and Footer- Inserting Page Breaks- Sorting Data	
3.0		**Advanced Features of Excel**	**8**
3	3.1	All Functions in Excel- Using Logical Functions Statistical Functions- Mathematical Functions – Linking Data between Worksheet Elements of Excel Charts-Categories.	
	3.2	Create a Chart- Choosing Chart Type- Edit Chart Axis –Titles, Labels, Data Series and Legend- Adding a Text Box- Rotate Text in a Chart.	
4.0		**Presentation Package**	**7**
4	4.1	Advantages of Presentation-Screen Layout- Creating Presentation- Inserting Slides-Adding Sounds and Videos-Formatting Slides -Slide Layout Views in Presentation	
	4.2	Colours Scheme-Background Action Buttons- Slide Transition- Custom Animation- Managing Slide Shows – Using Pen Setting Slide Intervals	

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Suggested List of Experiments

1. Create a new document, explore different templates, and understand the document structure.
2. Practice mail merging using a sample data source.
3. Record and use a simple macro to automate a repetitive task.
4. Insert, delete, and rename worksheets; freeze panes; and work with workbook elements.
5. Explore advanced formatting options, page layout settings, and print a worksheet. Sort and filter data in a worksheet
6. Use logical, statistical, and mathematical functions in Excel Link data between worksheets, create different types of charts, and customize chart elements.
7. Create a new presentation, explore different layouts, and add slides, Apply a color scheme, background, and formatting options to slides
8. Insert sounds and videos into slides, Apply slide transitions and custom animations to enhance presentation flow, Practice managing slide shows, including pen settings and slide intervals.

Text Books

1. Microsoft Office 365 & Office 2019: Advanced" by Misty E. Vermaat
2. Microsoft Office 2019 Inside Out" by Joe Habraken,

References

1. Excel 2019 Bible" by Michael Alexander and Richard Kusleika
2. Power Excel with MrExcel: Master Pivot Tables, Subtotals, Visualizations, VLOOKUP, Power BI, and Data Analysis" by Bill Jelen

Evaluation Scheme

4. TERM WORK assessment must be based on the overall performance of the student with every assignment graded from time to time.
5. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
6. Based on above scheme grading and TERM WORK assessment should be done.

*****

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	**Practical**	**Tutorial**	**Theory**	**Practical**	**Tutorial**
U01EM002	Engineering Management	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	**T2**	**FET**	**Total**	**Min pass**	**Marks**	**Min pass**	**Total (Marks)**
U01EM002	Engineering Management	-	10	5	15	40%	35	40%	50

Course Description

This course presents the principles and techniques of managing engineering projects from the initiation phase, through planning, execution, control and closeout. Students will develop the analytical skills and awareness necessary on the management side of engineering projects.

Pre-requisites: -

Course Objectives

- Understand the importance of management in engineering field.

- Apply knowledge of project management

- Understand the concept of material management.

- Explain importance of quality management

- **Course Outcomes:** After the successful completion of the course students will able to:

- **CO1**   **Explain[2]** function of principles of management.

- **CO2**   **Correlate[3]** knowledge of project management to various engineering project

- **CO3**   **Apply[3]** knowledge of material management

- **CO4**   **Explain2** importance of quality management in engineering field.

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Contents

Module	Unit	Description	Hours
1.0		**Introduction To Management**	**06**
1	1.1	Principles of Management (Henry Fayol) Functions of Management: Planning- Organizing ,Staffing Directing Supervision, Co-ordination, Communication, Motivation, Leading Controlling –Decision Making: Process, introduction to decision tree	
2.0		**Project Management**	**06**
2	2.1	Introduction, Need for Project Management, , The Project Life Cycle, Phases of Project Management, need of project management , Role of Project Manager (PM), Work Breakdown Structure (WBS)	
	2.2	Project Planning- Time Management, Tools for time management Bar Chart/ Gantt Charts, Mile stone chart- representation, uses, progress monitoring.	
3.0		**Project Control-**	**06**
3	3.1	Network analysis- Basic definition application, rules for drawing networks Critical Path Method (CPM)-Development of CPM Network Time Estimates, Calculations of Floats, Critical Path.	
	3.2	Programme Evaluation Review Techniques (PERT)- Time Estimates, Slack calculation , Probability of Project Completion.	
4.0		**Project Monitoring**	**06**
4	4.1	Project Network Updating, - introduction, process, data required for updating, steps in updating application	

Sanjay Ghodawat University, Kolhapur
Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

	4.2	Cost Control- introduction, project cost. Crashing/compression of network. Application	
5.0		**Material Management and Quality Control**	**06**
5	5.1	Objectives, Need for Inventory Control, EOQ Analysis, ABC analysis, Safety Stock, Purchase Procedure, Stores Record , site layout	
	5.2	Quality Management: Importance, Quality Circle, ISO 9000, QA, QC, QMS –Purpose	

References	
1	Chitkara, K.K. Construction Project Management: Planning, Scheduling and Control, McGraw Hill Publishing Company, New Delhi, 1998.
2	Jha, Kumar Neeraj., Construction Project management, Theory & Practice, Pearson Education India, 2015.
3	Punmia, B.C., Khandelwal, K.K., Project Planning with PERT and CPM, Laxmi Publication

Internal Assessment (T1, T2 and FET)

    7. T2 should be based on First to Fourth modules, for 10 marks.

    8. FET shall be assessed for 5 marks separately.

End Semester Examination

    11. Question paper will be of 35 marks comprise of 5 questions, each carrying 07 marks

    12. The duration of end semester examination shall be Two hours.

    13. The students need to solve all questions.

    14. Question No.1 will be compulsory and based on entire syllabus.

    15. Remaining question (Q.2 to Q.5) will be selected from all the modules

****

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U14VS401	Software Proficiency I (Java Programming)	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term work	Min pass	Marks	Min pass	Total (Marks)
U14VS401	Software Proficiency I (Java Programming)	25	40%	25	40%	50

Course Description

This course is designed to provide second-year computer engineering students with a solid foundation in Java programming language. Students will learn the fundamentals of Java programming, object-oriented principles, and practical application development techniques.

Pre-requisites: - U14PC303- Object Oriented Programming using C++

Course Objectives

- To learn basic principles of programming languages and programming paradigms
- To learn structuring the data and manipulation of data, computation and program structure
- To learn Object Oriented Programming (OOP) principles using Java Programming Language
- To learn basic concepts of logical and functional programming language

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Apply[3]** various object oriented features like inheritance, data abstraction, encapsulation and polymorphism to solve mathematical problems using JDK
- **CO2** **Apply[3]** the concept of multithreading, I/O operations, exception and networking to execute and handle multiple programs by using JDK
- **CO3** **Develop[4]** GUI application with database connectivity by using the concept of Swing and Applet
- **CO4** **Evaluate[5]** the compile time and run time error by using appropriate syntax
- **CO5** **Develop[4]** application to solve real world problems by using java language

Sanjay Ghodawat University, **Kolhapur**

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Contents

Module	Unit	Description	Hours
1.0		**Fundamentals of Programming**	7
1	1.1	Programming paradigms- Introduction to programming paradigms, Introduction to four main Programming paradigms- procedural, object oriented, functional, and logic & rule based.	
	1.2	Elementary Data Types : Primitive data Types, Character String types, User Defined Ordinal Types, Array types, Associative Arrays, Record Types, Union Types, Pointer and reference Type. Expression and Assignment Statements: Arithmetic expression, Overloaded Operators, Type conversions, Relational and Boolean Expressions, Short Circuit Evaluation, Assignment Statements, Mixed mode Assignment. Statement level Control Statements: Selection Statements, Iterative Statements, And Unconditional Branching. Subprograms: Fundamentals of Sub Programs, Design Issues for Subprograms, Local referencing Environments, Parameter passing methods. Abstract Data Types and Encapsulation Construct: Design issues for Abstraction, Parameterized Abstract Data types, Encapsulation Constructs, Naming Encapsulations	
2.0		**Fundamentals of JAVA, Arrays**	8
2	2.1	one dimensional array, multi-dimensional array, alternative array declaration statements ,String Handling: String class methods,	
	2.2	Classes and Methods: class fundamentals, declaring objects, assigning object reference variables, adding methods to a class, returning a value, constructors, this keyword, garbage collection, finalize() method, overloading methods, argument passing, object as parameter, returning objects, access control, static, final, nested and inner classes, command line arguments, variable -length arguments.	
3.0		**Inheritance, Packages and Exception Handling**	8
3	3.1	Inheritances: member access and inheritance, super class references, Using super, multilevel hierarchy, constructor call sequence, method overriding, dynamic method dispatch, abstract classes, Object class. Packages and Interfaces: defining a package, finding packages and CLASSPATH, access protection, importing packages, interfaces (defining, implementation, nesting, applying), variables in interfaces, extending interfaces, instance of operator.	
	3.2	Fundamental of exception, exception types, uncaught exceptions, try, catch, throw, and throws, finally, multiple catch clauses, nested try statements, built-in exceptions, and custom exceptions (creating your own exception sub classes). Managing I/O: Streams, Byte Streams and Character Streams, Predefined Streams, Reading Console Input, Writing Console Output, Print Writer class.	

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

4.0		Presentation Package	7
4	4.1	Concurrency and Synchronization, Java Thread Model: Thread priorities, Synchronization, Messaging, Main Thread, Creating thread: Implementing Thread using thread class and Runnable interface. Creating multiple threads using isAlive() and join()	
	4.2	Web Based Application in Java: Use of JavaScript for creating web based applications in java, Introduction to javascript frameworks- React, Vue, Angular	
5.0		GUI ad Database Connectivity	
5	5.1	Introduction to AWT programming Layout and component managers Event handling Applet class Applet life-cycle Passing parameters embedding in HTML Swing components – JApplet, JButton, JFrame, etc. Sample swing programs	7
	5.2	JDBC architecture Establishing connectivity and working with connection interface Working with statements Creating and executing SQL statements Working with Result Set	

Suggested List of Experiments

All the experiments will be based on the course content

1. Programs using constructor and destructor.

2. Creation of classes and use of different types of functions.

3. Count the number of objects created for a class using static member function.

4. Write programs on interfaces.

5. Write programs on packages.

6. Write programs using function overloading.

7. Programs using inheritance.

8. Programs using IO streams.

9. Programs using files.

10. Write a program using exception handling mechanism.

11. Programs using AWT

12. Programs on swing.

13. Programs using JDBC.

References

1. Herbert Schildt, "The Complete Reference Java", 9th Ed, TMH,ISBN: 978-0-07-180856-9.

2. Dr.R. Nageshwar Rao, "Core Java: An Integrated Approach", Dreamtech Press.

3. Programming with Java A Primer, E. Balaguruswamy Tata McGraw Hill Companies

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

4. Java Programming John P. Flynt Thomson 2nd.

Evaluation Scheme

1. TERM WORK assessment shall be based on the overall performance of the student with every assignment graded from time to time.

2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.

3. Based on above scheme grading and TERM WORK assessment should be done.

*****

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	**Practical**	**Tutorial**	**Theory**	**Practical**	**Tutorial**
U14PC404	Data Structure Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	**Min pass**	**Marks**	**Min pass**	**Total (Marks)**
U14PC404	Data Structure Lab	-	-	25	40%	25

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Apply[3]** operations of linear data structure to solve the given problem using a programming language.

- **CO2** **Apply[3]** operations of nonlinear data structure to solve the given problem using a programming language.

- **CO3** **Analyze[4]** searching and sorting techniques for solving search and sort problems using asymptotic notation.

Suggested List of Experiments

All the experiments will be based on the course content of **Data Structure - U14PC401**

Programs based on

1. array, function, pointer, structures
2. Singly Linked List
3. Doubly Linked List
4. Circular Linked List
5. Stack ADT – Static and Dynamic
6. Queue ADT – Static and Dynamic
7. Stack application, circular and double ended queue
8. Searching – Linear, Binary and Hashing
9. Sorting – Bubble, Selection, Insertion,
10. Sorting – Merge and Quick
11. Binary Search Tree, Traversal of Trees

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

12. Graph using adjacency list and traversal

References

1. Data Structure using C A. M. Tanenbaum,Y. Langsam, M.J. Augenstein Prentice- Hall Of India Pvt. Limited 2003

2. Understanding Pointers in C Yashavant Kanetkar BPB Publication I 2009

Evaluation Scheme:

1. TERM WORK assessment must be based on the overall performance of the student with every assignment graded from time to time.

2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.

3. Based on above scheme grading and TERM WORK assessment should be done.

*****

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U14PC405	Database Management System Laboratory	-	02	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U14PC405	Database Management System Laboratory	20	40%	-	-	25

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Design[4]** an ER diagram and convert it into relational database to solve the given problem through applying basic concepts database engineering

- **CO2** **Apply[3]** DDL and DML SQL queries to solve the given problems using a database management system

- **CO3** **Create[6]** and Exhibit solution for defined real world problem using hashing techniques, transaction processing, concurrency control etc.

List of Experiments

All the experiments will be based on the course content of **Database Management System- U14PC403**

1. Drawing an E-R Diagram for any organization. Converting E-R diagram into Relational Tables.
2. Installation and Demonstration of DBMS Oracle / MySQL / SQL Server / PostgreSQL etc.
3. Implementation of Data Definition Language (DDL) Queries (e.g. create, alter and drop tables).
4. Implementation of Data Manipulation Language (DML) Queries (e.g. insert, delete, update and select statements).
5. Implementation of Basic SQL SELECT statement for displaying / extracting data from single table or multiple tables.
6. Implementation of SQL constructs for aggregating data, use of group by, having clauses.
7. Implementation of nested sub-queries, complex queries, views and Joins.
8. Implementation of Triggers.
9. Implementation of Functions and Stored Procedures.
10. Implementation of Database connectivity with object oriented language (Java).

Sanjay Ghodawat University, Kolhapur
Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

References

1. Fundamentals of Database Systems Ramez Elmasri and Shamkant Navathe Pearson Education 4 edition 2007.
2. Systems: Design, Implementation and management Peter Rof, Carlos Coronel Cengage Learning 7 edition 2014.
3. Principles of Database Systems J. D. Ullman Galgotia publications 1 edition 2011
4. SQL: A Complete Reference Alexis Leon, Mathews Leon McGraw Hill Education 1 edition 2002

Evaluation Scheme

1. TERM WORK assessment must be based on the overall performance of the student with every assignment done on computer graded from time to time.

2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.

3. Based on above scheme grading and TERM WORK assessment should be done.

*****

Sanjay Ghodawat University, Kolhapur

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	**Practical**	**Tutorial**	**Theory**	**Practical**	**Tutorial**
U14MM066	Object Oriented Modelling and Design Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	**Min pass**	**Marks**	**Min pass**	**Total (Marks)**
U14MM066	Object Oriented Modelling and Design Lab	-	-	25	40%	25

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Apply**[3] object oriented modelling and design concepts to solve given problem using Rational Rose design tool.

- **CO2** **Sketch**[3] System design for given real time system using designing object oriented Concepts.

- **CO3** **Design** [4] different UML diagrams for given problem statement hy using STAR IIML Design tool.
.

Suggested List of Experiments

All the experiments will be based on the course content of **Object Oriented Modelling and Design - U14MM062**

Programs based on

1. Introduction of object oriented analysis and object oriented design.

2. Object Oriented Modeling, Choose a hypothetical system of significant complexity (on your project topic) and write an SRS.

3. Draw one or more Use Case diagrams for capturing and representing requirements of the system. Use case diagrams must include template showing description and steps of the Use Case for various scenarios.

4. Draw basic class diagrams to identify and describe key concepts like classes, types in your system and their relationships.

5. Draw sequence diagrams OR communication diagrams with advanced notation for

Sanjay Ghodawat University, **Kolhapur**

Established as a State Private University under Govt. of Maharashtra Act no. XL dated 3rd May 2017

Empowering Lives Globally !

your system to show objects and their message exchanges.

6. Draw activity diagrams to display either business flows or like flow charts.

7. Draw component diagrams assuming that you will build your system reusing

existing components along with a few new ones.

8. Draw deployment diagrams to model the runtime architecture of your system.

Text Books

1. Erich Gamma, Richard Helm, Ralph Johnson and john Vlissides: Design Patterns – Elements of Reusable Object-Oriented Software, Pearson Education,2007

2. Michael Blaha, James Rumbaugh: Object Oriented Modelling and Design with UML,2nd Edition, Pearson Education,2005

References

1. Grady Booch et.al.: Object-Oriented Analysis and Design with Applications,3rd Edition, Pearson Education,2007.

2. Booch, Jacobson, Rambaugh : Object-Oriented Analysis and Design with Applications, 3rd edition, Pearson, Reprint 2013

Evaluation Scheme:

4. TERM WORK assessment must be based on the overall performance of the student with every assignment graded from time to time.

5. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.

6. Based on above scheme grading and TERM WORK assessment should be done.

*****

Course code	Course name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U03AE003	**Hindi**	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U03AE003	**Hindi**		10	5	15	40%	35	40%	50

Course Description:

पाठ्यक्रम विवरणः

यह पाठ्यक्रम छात्रों के आधुनिक भारतीय भाषा हिंदी में दक्षता विकसित करने का उद्देश्य रखता है. जो उन्हें लिखित और बोली गई रूपों में प्रभावी रूप से संवाद करने की क्षमता प्रदान करता है। यह पाठ्यक्रम आपसी शिक्षण विधियों, सांस्कृतिक अन्वेषण और व्यापार दुनिया के संदर्भ में व्यावसायिक अनुप्रयोगों को मजबूती देने पर ध्यान केंद्रित करता है। छात्रों को विभिन्न गतिविधियों और असाइनमेंट्स में भाग लेने के लिए प्रोत्साहित किया जाएगा जो उन्हें व्यापारिक और पेशेवर वातावरण से संबंधित वास्तविक जीवन की स्थितियों में हिंदी का प्रयोग करने के लिए प्रोत्साहित करते हैं।.

पाठ्यक्रम के उद्देश्य **/ Course Objectives**

1. व्यक्तित्व विकास और भाषा के बीच सहसंबंध के बारे में जागरूकता पैदा करके छात्रों के व्यक्तित्व का विकास करना ।
2. विद्यार्थियों में भाषाई कौशल का विकास करना ।
3. विद्यार्थियों में साक्षात्कार कौशल का विकास करना ।
4. छात्रों में कार्यालय पत्र लेखन कौशल विकसित करना ।
5. छात्रों में ई-प्रौद्योगिकी आधारित भाषा कौशल विकसित करना ।

पाठ्यक्रम सीखने के परिणाम / Course Learning Outcomes

At the end of the course students will be able to -
पाठ्यक्रम के अंत में, छात्र निम्नलिखित क्षमताएँ प्रदर्शित करेंगे-

CLO1 व्यावसायिक संदर्भों में लिखित और मौखिक हिंदी में प्रवीणता प्रदर्शित करेंगे ।
CLO2 हिंदी बोलने वाले क्षेत्रों में ग्राहकों, सहकर्मियों और साथियों के साथ प्रभावी संवाद करेंगे ।
CLO3 छात्र हिंदी कहानी साहित्य का अध्ययन कर वर्तमान समाज एवं साहित्य से अवगत होंगे ।
CLO4 छात्र राजनीतिक, सामाजिक, सांस्कृतिक पृष्ठभूमि में कहनी का अध्ययन कर विश्लेषण करेंगे।

Course Contents

Module	Unit	Description	Hours
1.0		आधुनिक भारतीय भाषा हिंदी का परिचय	
1	1.1	हिंदी भाषा का परिचयः	7
	1.2	इतिहास, लिपि, और ध्वनिकी,	
	1.3	हिंदी का सामान्य रूप मातृभाषा, राजभाषा, राष्ट्रभाषा	
	1.4	हिंदी के महत्व की समझ	
2.0		पठित बोध - काव्यखण्ड	
2	2.1	दिन जल्दी जल्दी ढलता है -हरिवंशराय बच्चन	7
	2.2	कमरे में बंद अपाहिज- रघुवीर सहाय	
	2.3	दुख का अधिकार- यशपाल	
	2.4	कविता के बहाने - कुंवर नारायण	
3.0		पठित बोध -गद्य खंड	
3	3.1	शिरीष के फूल- हजारी प्रसाद द्विवेदी	7

	3.2	पंच परमेश्वर -प्रेमचंद	
	3.3	बाजार दर्शन - जैनेंद्र कुमार	
	3.4	काळा मेघा पानी दे धर्मवीर भारती	
4.0		**हिंदी में लेखन**	
4	4.1	संवाद लेखन	7
	4.2	कार्यालयीन पत्र लेखन	
	4.3	हिंदी में पेशेवर ईमेल	
	4.4	आवेदन पत्र	
5.0		**व्यावसायिक लेखन**	
5	5.1	व्यावसायिक दस्तावेज़ और प्रस्ताव	7
	5.2	विभिन्न प्रकार के पत्रों का व्यावहारिक अभ्यास	
	5.3	व्यावसायिक शब्दावली	
	5 .4	कार्यालयीन शब्दावली	

संदर्भ ग्रंथ सूची / List of Reference Books

1. हिंदी कहानी का विकास (भाग १ और २)- गोपाल राय, राधाकृष्ण प्रकाशन, नई दिल्ली
2. हिंदी साहित्य का दूसरा इतिहास- बच्चन सिंह
3. हिंदी कहानीः स्वरूप और संवेदना – राजेंद्र यादव
4. विज्ञापन पत्रकारिता – एन.सी.पंत, इंद्रजीत सिंह, कनिष्क पब्लिशर्स, नई दिल्ली
5. आधुनिक विज्ञापन और जनसंपर्क-डॉ.यू.सी.गुप्ता, लोक संस्कृति प्रकाशन, नई दिल्ली
6. प्रयोजनमूलक हिंदी- डॉ. माधव सोनटक्के, लोकभारती प्रकाशन, इलाहाबाद
7. अनुवाद विज्ञान – डॉ. भोलानाथ तिवारी, किताबघर प्रकाशन, दिल्ली
8. प्रयोजनमूलक हिंदीः प्रयुक्ति और अनुवाद, वाणी प्रकाशन, नई दिल्ली

Internal Assessment (T1, T2 and FET):

   1.T1 should be based on first two modules for 10 marks

   2.FET shall be assessed for 5 marks separately.

End Semester Examination:

   1.Question paper will comprise of 5 questions, each carrying 7 marks.

2.The duration of end semester examination shall be two hours.

3.The students need to solve all questions.

4.Question No.1 will be compulsory and based on entire syllabus.

5.Remaining question (Q.2 to Q.5) will be selected from all the modules.

Course code	Course name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U03VE004	Universal Human Values -II	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U03VE004	Universal Human Values- II		10	5	15	40%	35	40%	50

Course Description:

Human civilization is known for the values that it cherishes and practices. Across various times and places, sages, saints, and seers, drawing on their experience, developed practices that placed central importance on values, though the names used by them differed, as their languages varied the spirit was the same. Universal human values are values that human beings cherish and hold in common consciously and otherwise in most places and times and practice them.

Course Objectives:

- Describe the meaning, purpose, and relevance of universal human values.
- Understand the importance of values in individual, social, career, and national life.
- Learn from the lives of great and successful people who followed and practiced human values and achieved self-actualization.

Course Outcomes:

After the successful completion of the course, students will be able to:

CO1   Become conscious practitioners of values.
CO2   Realize their potential as human beings and conduct themselves properly in the ways of the world.
CO3   Develop integral life skills with values.
CO4   Inculcate and practice them consciously to be a good human being.
CO5   Realize one's potential as a human being.

Course Contents

Module	Unit	Description	Hours
1.0		**Love & Compassion (Prem and Karuna)**	
1	1.1	What is love and its forms: love for self, parents, family, friend, spouse, community, nation, humanity and other beings—living and non-living.	5
	1.2	Love and compassion and inter-relatedness: The facilitator needs to explain the relationship between love and compassion and other related feelings and emotions like empathy, sympathy and non-violence.	
	1.3	Individuals who are remembered in history or in collective memory for practicing compassion and love: (e.g., Buddha, Christ)	
	1.4	Narratives and Anecdotes from history, literature including local folklore	
2.0		**Truth (Satya)**	
2	2.1	What is truth? Universal truth, truth as value (arth), truth as fact (saty) (veracity, sincerity, honesty among others	5
	2.2	Individuals who are remembered in history for practicing this value (Raja Harishchandra, Dharmaraj Yudhishthara, Mahatma Buddha, Socrates, Mahatma Gandhi	
	2.3	Narratives and Anecdotes from about truth history, collective memory and literature including local folklore	
3.0		**Non-Violence (Ahimsa)**	
3	3.1	What is non-violence? Its need. Love, compassion, empathy and sympathy for others as pre-requisites for non-violence	5
	3.2	Ahimsa as non-violence and non-killing	
	3.3	Individuals and organizations that are known for their commitment to nonviolence	
	3.4	Narratives and Anecdotes about non-violence from history, literature including local folklore	
4.0		**Righteousness (Dharma) , Service (Seva)**	
4	4.1	What is righteousness? Righteousness and dharma, Righteousness and Propriety	8
	4.2	Individuals who are remembered in history for practicing righteousness, Narratives and Anecdotes from history, literature including local folklore	
	4.3	What is service? Forms of service, for self, parents, spouse, family, friend, community, persons in distress or disaster, nation, humanity, and other—living beings and non-living things.	
	4.4	Individuals who are remembered in history for practicing this value. Narratives and Anecdotes dealing with instances of service from history, literature including local folklore.	
5.0		**Peace (Shanti), Renunciation (Sacrifice) Tyag**	
5	5.1	What will learners learn/gain if they practice peace? What will learners lose if they don't practice it? Sharing learner's individual and/or group experience(s) about peace, Simulated Situations, Case studies	7

	5.2	What is renunciation? Renunciation and sacrifice. Greed is the main obstruction in the path of renunciation. Self-restraint and Ways of overcoming greed. Renunciation with action as true renunciation	
	5.3	Individuals who are remembered in history for practicing this value. (Rama, Bhishma, Buddha, Mahavira, Christ, Guru Govind Singh, Bhagat Singh, and Mahatma Gandhi)	
	5.4	Narratives and Anecdotes from history and literature, including local folklore about individuals who are remembered for their sacrifice and renunciation.	

List of Reference Books :

1. **Radha Kumud Mookerji** (1989). Ancient Indian Education, Motilal Banarasidass.
2. **Swami Satyananda Saraswati** (2008). Asana Pranayama Mudra Bandha, Bihar School of yoga.
3. **Kireet Joshi** (1997). Education for Character Development, Dharma Hinduja Center of Indic Studies.
4. **A.L. Basham** (1954). The Wonder That Was India, London: Picador Press.
5. **Rokeach Milton** (1973). The Nature of Human Values. New York: The Free Press.
6. **Ghosh, Sri Aurobindo** (1998). The Foundations of Indian Culture. Pondicherry: Sri Aurobindo Ashram.

- **Internal Assessment (T1, T2 and FET):**

    1. T1 should be based on the first two modules for 10 marks

    2. FET shall be assessed for 5 marks separately.

- **End Semester Examination:**

    1. The question paper will comprise 5 questions, each carrying 7 marks.

    2. The duration of the semester-end examination shall be two hours.

    3. The students need to solve all questions.

    4. Question No.1 will be compulsory and based on the entire syllabus.

    5. The remaining questions (Q.2 to Q.5) will be selected from all the modules.

****

Course code	Course name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U03AE005	**मराठी**	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U03AE005	**मराठी**		10	5	15	40%	35	40%	50

Course Description:

मराठी भाषा ही जगातील एक महत्त्वाची भाषा आहे. आठ शतकाहून अधिक काळची समृद्ध वाङ्मयीन परंपरा मराठीस लाभली आहे. त्यामुळे मराठी भाषा व वाङ्मयीन परंपरेचे ज्ञान देणे तसेच आधुनिक काळात उपयोजित भाषिक कौशल्यांचा झालेला विस्तार लक्षात घेता रोजगाराभिमुख अभ्यासक्रमांची अमंलबजावणी करुन विद्यार्थ्यांमधील भाषिक क्षमतांचा विकास करणे हे भाषासाहित्य अभ्यासाचे उद्दिष्ट आहे. या अभ्यासक्रमाच्या अध्ययनातून जागतिकीकरणाच्या काळात भाषिक कौशल्यांचा समर्थ आविष्कार व उपयोजन करणारा सजग विद्यार्थी घडविण्याचा प्रयत्न आहे.

Course Objectives:

1. विद्यार्थ्यांमध्ये व्यक्तिमत्व विकास व भाषा यांच्या सहसंबंधाची जाणीव निर्माण करून विद्यार्थ्यांचा व्यक्तिमत्व विकास घडविणे .
2. विद्यार्थ्यांमधील भाषिक कौशल्यांचा विकास करणे .
3. विद्यार्थ्यांमध्ये मुलाखतीचे कौशल्य विकसित करणे
4. विद्यार्थ्यांमध्ये कार्यालयीन पत्रलेखनाचे कौशल्य विकसित करणे .
5. विद्यार्थ्यांमध्ये इ – तंत्रज्ञानावर आधारित भाषिक कौशल्ये विकसित करणे .

Course Outcomes:

After the successful completion of the course students will able to

CO1 व्यक्तिमत्त्व विकासासाठीची भाषिक कौशल्ये विकसित होतील.

CO2 वक्तृत्व व वादविवाद कौशल्यावर प्रभुत्व संपादन होईल.

CO3 मुलाखत कौशल्य विकसित होईल.

CO4 पत्रव्यवहाराचे कौशल्य अवगत होईल.

CO5 इ - संहिता निर्मिती कौशल्ये विकसित होतील.

Course Contents

Module	Unit	Description	Hours
1.0		**व्यक्तिमत्त्व विकास व भाषा**	
1	1.1	व्यक्तिमत्त्व विकास – संकल्पना व्यक्तिमत्त्व विकासासाठीचे घटक	6
	1.2	Swot विश्लेषण आणि ध्येय निश्चिती	
	1.3	व्यक्तिमत्त्व विकास व भाषा	
	1.4	व्यक्तिमत्त्व विकास व देहबोली	
2.0		**भाषिक कौशल्ये**	
2	2.1	भाषा म्हणजे काय?, भाषिक कौशल्यांचे प्रकार	6
	2.2	**वक्तृत्व कौशल्य** – संकल्पना, वक्तृत्वाची वैशिष्ट्ये, वक्तृत्वासाठी आवश्यक घटक, भाषण व व्याख्यान यामधील फरक, वक्तृत्वाची पूर्वतयारी- विषयाची निवड, व्यासंग, मुद्देसूद मांडणी, वक्तृत्वाची भाषा, देहबोली इ.	
	2.3	**वादविवाद कौशल्य** – वादविवादाची संकल्पना, वादविवादासाठी विषयाची निवड, वादविवादाची पद्धती,	

		विषयाच्या दोन्ही बाजूंची जाण , तार्किक मांडणी, खंडण-मंडण, प्रभावी सादरीकरण इत्यादी.	
	2.4	**प्रात्यक्षिक कार्य**	
3.0		**मुलाखत कौशल्य**	
3	3.1	मुलाखत : संकल्पना, उदिष्ट्ये, महत्त्व, प्रकार	6
	3.2	मुलाखतीपूर्वीची पूर्वतयारी	
	3.3	मुलाखत कशी द्यावी?	
	3.4	मुलाखतीचे प्रात्यक्षिक	
4.0		**कार्यालयीन पत्रलेखन**	
4	4.1	पत्रलेखन : संकल्पना, प्रकार, महत्त्व, इ- पत्र (इमेल)	6
	4.2	कार्यालयीन, व्यावसायिक व नोकरीसाठी पत्रलेखना□□ स्वरूप	
	4.3	स्वपरिचय (Resume)	
	4.4	प्रात्यक्षिक कार्य	
5.0		**इ - तंत्रज्ञान आणि भाषिक कौशल्ये**	
5	5.1	इ- फॉर्म निर्मिती	6
	5.2	इ- प्रोफाईल	
	5.3	इ- सर्टिफिकेट	
	5.4	ॲप्स आणि भाषिक उपयोजन	
	5.5	प्रात्यक्षिक कार्य	

संदर्भग्रंथ:

१. काळे, कल्याण, पुंडे द. दि. : व्यावहारिक मराठी, निराली प्रकाशन, पुणे, २००७
२. कुलकर्णी, य. प्र. व इतर : व्यावहारिक मराठी पाठ्यपुस्तक, पुणे विद्यापीठ प्रकाशन, पुणे, १९८४

३. गवस, राजन, शिंदे अरुण, पाटील, गोमटेश : भाषिक सर्जन आणि उपयोजन, दर्या प्रकाशन, पुणे, २०१२

४. गोविलकर, लीला, पाटणकर जयश्री : व्यावहारिक मराठी, स्नेहवर्धन पब्लिशिंग हाऊस, पुणे, २००४

५. थोरात, संजय : वक्तृत्व, प्रतिभा बुक, इस्लापूर

६. देसाई, रवींद्र : प्रभावी भाषणकला, प्रफुल्लता प्रकाशन, पुणे

७. नसिराबादकर, ल. रा : व्यवहारिक मराठी, भाषाविकास संशोधन संस्था, कोल्हापूर, २०२३

८. पेंडसे, अंजली : देहबोली, नीलकंठ प्रकाशन, पुणे, २०२४.

९. भुकेले, शिवाजीराव : बिनधास्त बोला, मुक्ता पब्लिशिंग हाऊस, कोल्हापूर

१०. भोसले, शिवाजीराव : वैखरी, अक्षरब्रह्म प्रकाशन, पुणे

११. भोसले, शिवाजीराव : कथा वक्तृत्वाची, अक्षरब्रह्म, पुणे, २००३

१२. मिरजकर, श्यामसुंदर : सूत्रसंचालन : एक प्रयत्नसाध्य कला, नाग - नालंदा प्रकाशन, इस्लामपूर, २०१३

१३. लागू, श्रीराम : वाचिक अभिनय, राजहंस प्रकाशन, पुणे.

१४. सेन, अमर्त्य : वाद संवादप्रिय भारतीय, साठे शारदा (अनु.) पेंग्विन बुक्स इंडिया, २००८

१५. हवालदार, मोहन : ओरावेब (वक्तृत्व ते वेबीनार), □क्युरेट फिचर्स, कोल्हापूर, २०२१

१६. अहिरे, गजेंद्र : स्टोरी टेलर, रोहन प्रकाशन, पुणे, २०१७

१७. कहाते, अतुल : □मॅझॉन, मनोविकास प्रकाशन, पुणे

१८. कहाते, अतुल : तंत्रज्ञानाचा ओव्हरलोड, मनोविकास प्रकाशन, पुणे

१९. कहाते, अतुल : "आयटी गाथा', मेहता पब्लिकेशन, पुणे

२०. कहाते, अतुल : फेसबुक, मेहता पब्लिकेशन, पुणे

२१. गोडबोले, अच्युत : आर्टिफिशियल इंटेलिजन्स, मधुश्री प्रकाशन, पुणे

२२. गोडबोल, अच्युत : इन्फोटेक, मधुश्री पब्लिकेशन, पुणे, २०२१

२३. जोशी, नीलांबरी : माध्यमकल्लोळ, मनोविकास प्रकाशन, पुणे, २०२२

२४. मतकरी, गणेश : फिल्म मेकर्स, मॅजेस्टिक प्रकाशन, पुणे

२५. भागवत, यशोदा : ग्राफिक डिझाइनचं गारूड, मौज प्रकाशन, मुंबई

२६.   भागवत, यशोदा : जाहिरातीलचं जग, मौज प्रकाशन, मुंबई

२७.   वरखेडे, रमेश :   सायबर संस्कृती, इन्स्टिट्यूट ऑफ नॉलेज इंजिनिअरिंग, नाशिक

२८.   विद्यासागर, पंडित : विज्ञान आणि तंत्रज्ञान विश्वकर्म, प्रकाशन, पुणे, २०२३

- **Internal Assessment** (T1, T2 and FET):

    1.T1 should be based on first two modules for 10 marks

    2.FET shall be assessed for 5 marks separately.

- **End Semester Examination:**

    1.Question paper will comprise of 5 questions, each carrying 7 marks.

    2.The duration of end semester examination shall be two hours.

    3.The students need to solve all questions.

    4.Question No.1 will be compulsory and based on entire syllabus.

    5.Remaining question (Q.2 to Q.5) will be selected from all the modules.

    ****