SANDIP UNIVERSITY

Courses of Study

2018-19

Computer Engineering

IILP

SANDIP UNIVERSITY

School of Engineering and Technology

B.Tech. (Part Time) Computer Science and Engineering 2018-19

Semester	Course I				Course II				Course III				Course IV				Course V				Course VI				Course VII				Course VIII	L	T	P	C	Contact Hours
I	TYCE101				TYCE102				TYCE103				TYCE104				TYCE105				Code				Code				Code	10	3	4	15	17
	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C						
	3	1	0	**4**	3	1	2	**5**	3	1	0	**4**	0	0	0	**0**	1	0	2	**2**	0	0	0	**0**	0	0	0	**0**						
	BS				PC				PC				BS				HSS																	
	Algebra and Differential Calculus Statistics, Probability				Programming and Data Structures Through C				Microprocessor & Interfacing								Communication Skills																		
II	TYCE201				TYCE202				TYCE203				TYCE204				TYCE205								Code				Code	15	2	6	20	23
	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C						
	3	0	2	**4**	3	1	2	**5**	3	0	0	**3**	3	1	0	**4**	3	0	2	**4**	**0**	0	0	**0**	0	0	0	**0**						
	BS				PC				PC				PC				ES																	
	Applied Physics and Chemistry				Object oriented Programming Through C++ (MOOC)				Computer Organization & Architecture				Discrete Mathamatics				Fundamentals of Computing																		

SANDIP UNIVERSITY

School of Engineering and Technology

B.Tech. (Part Time) Computer Science and Engineering 2018-19

Semester	Course I				Course II				Course III				Course IV				Course V				Course VI				Course VII				Course VIII				L	T	P	C	Contact Hours
III	TYCE301				TYCE302				TYCE303				TYCE304				TYCE305				Code				Code				Code				13	3	4	21	20
	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C					
	4	0	2	**5**	3	1	0	**4**	3	1	2	**5**	3	1	0	**4**	0	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**					
	PC				PC				PC				PC				PWSI																				
	Objet oriented programming through JAVA (MOOC)				Computer Networks				Compiler Design				System Software				Internship I																				
IV	TYCE401				TYCE402				TYCE403				TYCE404				TYCE405				TYCE406				Code				Code				11	3	10	19	24
	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C					
	3	1	2	**5**	3	1	0	**4**	3	1	2	**5**	0	0	0	**0**	2	0	2	**3**	0	0	4	**2**	0	0	0		0	0	0	**0**					
	PC				PC				PC				PC				HSS																				
	Operating System (MOOC)				Theory of Computation				Data Base Management Systems								Technical Communication				Seminar																

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School of Engineering and Technology

B.Tech. (Part Time) Computer Science and Engineering 2018-19

Semester	Course I				Course II				Course III				Course IV				Course V				Course VI				Course VII				Course VIII				L	T	P	C	Contact Hours
V	TYCE501				TYCE502				TYCE503				TYCE504				TYCE505				TYCE506				Code				Code				9	2	10	20	21
	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C					
	3	0	0	**3**	3	1	2	**5**	3	1	2	**5**	0	0	0	**0**	0	0	0	**4**	0	0	6	**3**	0	0	0	**0**	0	0	0	**0**					
	PC				PC				PC				PC				PWSI				PWSI																
	Software Engineering				Object Oriented Analysis and Design				Scripting Languages Python								Internship II				Mini Project																
VI	TYCE601				TYCE602				TYCE603				TYCE604				TYCE605				TYCE606				Code				Code				16	1	6	20	23
	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C					
	4	0	0	**4**	3	1	0	**4**	3	0	0	**3**	3	0	0	**3**	3	0	0	**3**	0	0	6	**3**	0	0	0	**0**	0	0	0	**0**					
	PC				PC				PCE				PCE				OE				PWSI																
	Artificial Intelligence				Digital Signal Processing				DEI				DEII				OEI				Project Stage I																

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School of Engineering and Technology

B.Tech. (Part Time) Computer Science and Engineering 2018-19

Semester	Course I				Course II				Course III				Course IV				Course V				Course VI				Course VII				Course VIII				L	T	P	C	Contact Hours
VII	TYCE701				TYCE702				TYCE703				TYCE704				TYCE705				Code				Code				Code				9	1	18	25	28
	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C					
	3	1	2	**5**	3	0	0	**3**	3	0	0	**3**	0	0	16	**8**	0	0	0	**6**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**					
	PC				PCE				OE				PCE				PWSI																				
	Software Testing				DEIII				OEII				Project Stage II & Viva Voce				Internship III																				
																													TOTAL				**83**	**15**	**58**	**140**	**156**

SANDIP UNIVERSITY

SYLLABUS

INDUSTRY INTEGRATED LEARNING PROGRAMME

IN

B.TECH. COMPUTER SCIENCE AND ENGINEERING

Semester- I

Sr. No.	Course Code	Course Name	L	T	P	C	Marks
THEORY							
1	TYCE101	Algebra and Differential Calculus Statistics, Probability	3	1	0	4	100
2	TYCE102	Programming and Data Structures Through C	3	1	2	5	100
3	TYCE103	Microprocessor & Interfacing	3	1	0	4	100
4	TYCE105	Communication Skills	1	0	2	2	100
PRACTICAL							
5	TYCE106	Programming and Data Structures Through C Lab					50
6	TYCE107	Communication Skills Lab					50
		TOTAL CREDITS:	10	3	4	15	500

Year: First Year **Semester – I**

Course: Algebra and Differential Calculus Statistics, Probability **Course Code:** TYCE101

Teaching Scheme (Hrs. /Week)				Continuous Internal Assessment (CIA)				End Semester Examination		Total
L	T	P	C	CIA-1	CIA-2	CIA-3	Lab	Theory	Lab	
3	1	0	4	20	20	10	--	50	--	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.								End Semester Exam (Lab) – 00 Hrs.		

Perquisites:
C Programming

Objectives:	
The course will enables students to:-	
1	
2	
3	

Unit No	Details	Hours
1		8
2		8
3		7
4		8
5		7

Outcomes:	
On completion of the course, student will be able to–	
1	
2	
3	
Text Books	
1.	

Reference Book
1.

Year: First Year **Semester – I**

Course: Programming and Data Structures Through C **Course Code:** TYCE102

Teaching Scheme (Hrs. /Week)				Continuous Internal Assessment (CIA)				End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**Lab**	**Theory**	**Lab**	
3	1	2	5	20	20	10	--	50	--	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.								**End Semester Exam (Lab) – 00 Hrs.**		

Perquisites:
C Programming

Objectives:	
The course will enables students to:-	
1	Introduce the basics of C programming language.
2	Introduce the concepts of ADTs.
3	Introduce the concepts of Hashing and Sorting.

Unit No	Details	Hours
1	**Introductory concepts of C-** Data types-Control structures-Definitions of Data Structure and Algorithm –The Abstract Data Type-Algorithm efficiency-Searching-List structures-Hashed List structures-Basic concepts-Hashing methods	8
2	**Linear and Linked List concepts**-Linked List Algorithms-Processing a Linked List-List Applications-Complex Linked List Structures-Implementation-Case studies	8
3	**Stacks:** Basic Operations- Linked List Implementation- Applications-Stack ADT-Array Implementation- **Queues**: Operations-Linked List design-Implementation-Case study-Overflow and underflow of stack size	7
4	**Trees:** Basic Tree Concepts-Binary Trees- Tree Traversals- General Trees- Search Trees: Binary Search Trees-AVL trees- **Graphs:** Operations-Depth First Traversal-Breadth First Traversal-Implementation-StorageStructures-Case studies	8
5	General Sort concepts-Insertion Sort-Shell Sort-Selection Sort-Heap Sort-Exchange Sort-Bubble sort-Quick Sort-Case studies	7

Outcomes:	
On completion of the course, student will be able to–	
1	Several data structures concepts like stack, queues, linked list, trees and files
2	Applications of data structures
3	Problem solving using data structure tools and techniques
Text Books	

1. RICHARD F.GILBERG AND BEHROUZ A.FOROUZAN "*DATA STRUCTURES - A Pseudo codeApproach with C++*",THOMSON ASIA, 2005.

Reference Book

1. HERBERT SCHILDT "The Complete Reference C++" Fourth Edition, TataMcGraw Hill Edition, 2003.
2. YEDIDYAH LANGSAN, MOSHE J. AUGENSTEIN AND AORON M. TANENBAUM "Data Structures using C and C++", Prentice-Hall of India Pvt Ltd, 2004.
3. SARTAJ SAHNI "Data Structures, Algorithms and Applications in C++", McGraw-Hill International Edition, 2000.
4. MARK ALLEN WEISS, "Data Structures and Algorithm Analysis in C++" Addison-Wesley Publishing Company, 1994.
5. AHO, HOPCROFT, ULLMAN – "Data Structures and algorithms" – Pearson Education – 1983.
6. JEAN PAUL TREMBLAY & PAUL SORENSON – "An Introduction to Data Structures with

Year: First Year **Semester – I**
Course: Microprocessor & Interfacing **Course Code:** TYCE103

Teaching Scheme (Hrs. /Week)				Continuous Internal Assessment (CIA)				End Semester Examination		Total
L	T	P	C	CIA-1	CIA-2	CIA-3	Lab	Theory	Lab	
3	1	0	4	20	20	10	--	50	--	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.								End Semester Exam (Lab) – 00 Hrs.		

Perquisites:
Digital Circuits

Objectives:	
The course will enables students to:-	
1	Architecture of 8086 & 8088 microprocessors
2	Instruction sets of 8086/88 and programming.
3	Math Coprocessor & I/O processor and multiprocessor configuration
4	Interfacing of microprocessor with various peripheral devices

Unit No	Details	Hours
1	**Intel 8085 Architecture**Introduction to 8085 - 8085 architecture- Instruction Set & Assembler Directives- Assembly Language Programming with 8085.	7
2	**Intel 8086/8088 Architecture** Introduction to 8086/8088 - 8086/8088 architecture- Instruction Set & Assembler Directives- Assembly Language Programming with 8086/8088- Special Architectural Features.	9
3	**Communication Interfaces** Basic Peripherals & their interfacing with 8086/8088- Semiconductor Memory Interfacing-Dynamic RAM Interfacing-Interfacing I/O Ports-PIO 8255-Modes of Operation-Interfacing Analog to Digital Data Converters-Stepper Motor Interfacing	8
4	**Peripheral Interfaces:** Special Purpose Programmable Peripheral Devices & their Interfacing-Programmable Interval Timer 8253-Programmable Interrupt Controller 8259A-DMA Controller 8257-DMA Transfers & Operations-Programmable DMA Interface 8237.	12
5	**Multiprocessor Systems:** Interconnection Topologies- Software Aspects of Multiprocessor Systems- Numeric Processor 8087- Bus Arbitration & Control- Tightly Coupled & Loosely Coupled Systems	9

Outcomes:	
On completion of the course, student will be able to–	
1	Draw 8086 & 8088 microprocessors architectures.
2	Write 8086 & 8088 microprocessor programs.
3	Understand various peripherals and configurations of microprocessors.

Text Books
1. Ray A K, K M Bhurchandi, "*Advanced Microprocessor & Peripherals",* Tata McGraw Hill,1st Edition,2000.(CH1,CH2,CH3,CH4,CH5,CH6,CH7,CH8,CH16.)
Reference Book
1. Douglas V Hall, "*Microprocessor & Interfacing*", Tata McGraw Hill, 2nd Edition,1999. 2. Rafiquzzuman M, "*Microprocessor theory & Applications*", Prentice Hall of India,1994. 3. Yuchenhiu, Glenn A Gibson, "*Microprocessor Systems - 8086/8088 Family*", PrenticeHall of India, 2nd Edition, 1986.

Year: First Year **Semester – I**

Course: Communication Skills **Course Code:** YCE105

Teaching Scheme (Hrs. /Week)				Continuous Internal Assessment (CIA)				End Semester Examination		Total
L	T	P	C	CIA-1	CIA-2	CIA-3	Lab	Theory	Lab	
4	0	0	4	20	20	10	--	50	--	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.								End Semester Exam (Lab) – 00 Hrs.		

Perquisites:

Objectives:	
The course will enables students to:-	
1	
2	
3	
4	
5	

Unit No	Details	Hours
1		9
2		9
3		8
4		9
5		9

Outcomes:	
On completion of the course, student will be able to–	
1	
2	
3	
Text Books	
1	
Reference Book	

1.

Year: Second Year **Semester – III**

Course: Programming and Data Structures Through C Lab **Course Code:** YCE106

Teaching Scheme (Hrs. /Week)				Continuous Internal Assessment (CIA)				End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**Lab**	**Theory**	**Lab**	
0	0	3	2	--	--	--	25	0	25	50
Max. Time, End Semester Exam (Theory) -00 Hrs.								**End Semester Exam (Lab) – 03 Hrs.**		

Prerequisites:
C Programming, Data Structure Concepts

Objectives:	
Students are able to:-	
1	File Operations
2	Various types of Data structure
3	Understand ADT

Suggested List of Laboratory Assignments
1. Programs for Control Structures, Arrays, and Functions. 2. Programs using pointers. 3. Programs using structures. 4. Programs using file IO and preprocessing. 5. Array implementation of List Abstract Data Type (ADT) 6. Linked list implementation and cursor implementation of List ADT 7. Stack ADT – Array and linked list implementations 8. Implement any Stack application using an appropriate header file for the Stack ADT, a separate source file for the array implementation of the Stack ADT, and a separate source file for the application. Use the linked list implementation instead of the array implementation, keeping the other files the same. 9. Implement source files for other applications of the Stack ADT and use the array and linked list implementations interchangeably. 10. Implement the Queue ADT in different ways and use it for different applications. 11. Search ADT using different implementations including Sorted Link List, Binary Search Tree hashing, and different applications. 12. Sorting of numbers

Year: First Year **Semester – III**

Course: **Course Code:** YCE107

Teaching Scheme (Hrs. /Week)				Continuous Internal Assessment (CIA)				End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**Lab**	**Theory**	**Lab**	
0	0	3	2	--	--	--	25	0	25	50
Max. Time, End Semester Exam (Theory) -00 Hrs.								**End Semester Exam (Lab) – 03 Hrs.**		

Prerequisites:

Objectives:	
Students are able to:-	
1	
2	
3	

Suggested List of Laboratory Assignments
1.

Semester- II

Sr. No.	Course Code	Course Name	L	T	P	C	Marks
THEORY							
1	TYCE201	Applied Physics and Chemistry	3	0	2	4	100
2	TYCE202	Object oriented Programming Through C++ (MOOC)	3	1	2	5	100
3	TYCE203	Computer Organization & Architecture	3	0	0	3	100
4	TYCE204	Discrete Mathematics	3	1	0	4	100
5	TYCE205	Fundamentals of Computing	3	0	2	4	100
PRACTICAL							
6		Applied Physics and Chemistry Lab					
7		Object oriented Programming Through C++ Lab	0	0	3	2	50
8		Fundamentals of Computing	0	0	3	2	50
		TOTAL CREDITS:	12	0	6	20	500

Year: First Year **Semester – II**

Course: Applied Physics and Chemistry **Course Code:** TYCE201

Teaching Scheme (Hrs. /Week)				Continuous Internal Assessment (CIA)				End Semester Examination		Total
L	T	P	C	CIA-1	CIA-2	CIA-3	Lab	Theory	Lab	
3	0	2	4	20	20	10	--	50	--	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.								End Semester Exam (Lab) – 00 Hrs.		

Perquisites:

Objectives:	
The course will enables students to:-	
1	
2	
3	

Unit No	Details	Hours
1		8
2		8
3		7
4		8
5		7

Outcomes:	
On completion of the course, student will be able to–	
1	
2	
3	
Text Books	

1
Reference Book
1.

Year: First Year **Semester – II**
Course: Object oriented Programming Through C++ (MOOC) **Course Code:** TYCE202

Teaching Scheme (Hrs. /Week)				Continuous Internal Assessment (CIA)				End Semester Examination		Total
L	T	P	C	CIA-1	CIA-2	CIA-3	Lab	Theory	Lab	
3	1	2	5	20	20	10	--	50	--	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.								End Semester Exam (Lab) – 00 Hrs.		

Perquisites:
C++ Programming

Objectives:	
The course will enables students to:-	
1	To study the object-oriented programming principles and techniques.
2	To understand and apply fundamental concepts of OOP such as data abstraction, encapsulation, inheritance, dynamic binding and polymorphism.
3	To create base of cutting-edge programming.

Unit No	Details	Hours
1	Foundations of Object Oriented Programming :Introduction: Introduction to procedural, modular, object-oriented and generic programming techniques, Limitations of procedural programming, Need of object-oriented programming, fundamentals of object-oriented programming: objects, classes, data members, methods, messages, data encapsulation, data abstraction and information hiding, inheritance, polymorphism	8
2	C++ Extensions to C : Variable declarations, global scope, ‘const’, reference variables, operators in C++(scope resolution, new , delete), dynamic memory allocation, function prototypes, default and constant arguments, ‘cin’, ‘cout’, inline functions	8
3	Overloading and Inheritance : Function overloading, friend function, friend class Operator Overloading : Introduction, Need of operator overloading, rules for operator overloading, overloading the unary and binary operators using member function, operator overloading using friend function, overloading relational and logical operators, overloading new, delete and assignment operator, type conversions Inheritance : Introduction, Need of inheritance, base and derived classes, member access control, types of inheritance, derived class constructor, constructors in multiple inheritance, overriding member functions, ambiguity in multiple inheritance, virtual base class	7
4	Virtual Functions and Templates : Virtual functions : Pointers to objects, ‘this’ pointer, Pointers to derived class, virtual function, rules for virtual function, pure virtual function, abstract class, virtual destructors, early and late binding, container classes Templates : Introduction, Function template and class template, overloading	8

	function template, member function templates and template arguments, Introduction to Standard Template Library (STL), containers, iterators and algorithms	
5	Exception Handling and File I/O : Namespaces: Introduction, Rules of namespaces Exception Handling: Introduction, Exception handling mechanism: try, catch and throw, Multiple Exceptions, Exceptions with arguments Managing Console I/O Operations: Introduction, C++ streams, stream classes, unformatted I/O, formatted I/O and I/O manipulators File I/O: Introduction, Classes for file stream operations, file operations (open, close, read, write, detect end of file), file modes, File pointers and their manipulations, error handling during file operations	7

Outcomes:	
On completion of the course, student will be able to–	
1	Apply standards and principles of OOP to write executable code.
2	Understand and apply constructs such as friend function, static members, constructors and destructors in C++.
3	Understand and apply exception handling mechanism and debugging in C++.

Text Books

1. R G Dromey, "How to Solve it by Computer", Pearson Education, 2008, ISBN-13: 978-8131705629. 2. Maureen Spankle, "Problem Solving and Programming Concepts", Pearson, 2011, ISBN-13: 978-0132492645.
2. Robert Lafore, "Object-Oriented Programming in C++", SAMS Techmedia.

Reference Book

2. Joyce Farrell, "Programming Logic and Design", Cengage Learning, ISBN-13: 978-1285776712.
3. . E. Balaguruswamy, "Object-oriented Programming with C++", Tata McGraw Hill, 5th edition.
4. Herbert Schildt, "C++: The Complete Reference", McGraw-Hill.
5. Shukla, "Object-Oriented Programming in C++, w/cd", Wiley, ISBN-9788126516582.
6. Kogent, "Object Oriented Programming Methodology", Wiley, ISBN-9789351191841.
7. . Venugopal, "Mastering C++", McGraw-Hill, ISBN-9781259029943.

Year: First Year **Semester – IV**
Course: Computer Organization & Architecture **Course Code:** TYCE203

Teaching Scheme (Hrs. /Week)				Continuous Internal Assessment (CIA)				End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**Lab**	**Theory**	**Lab**	
3	0	0	3	20	20	10	--	50	--	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.								**End Semester Exam (Lab) – 00 Hrs.**		

Perquisites:
Fundamental of Programming Languages

Objectives:	
The course will enables students to learn:-	
1	Various Computer architectures
2	Functions of CPU, Control unit, I/O Processing
3	Memory and its types
4	Design of the above components

Unit No	Details	Hours
1	**Introduction :** Evolution of Computer Systems-Computer Types-Functional units-Basic operational concepts-Bus structures- Memory location and addresses-memory operations- Addressing modes-Design of a computer system- Instruction and instruction sequencing, RISC versus CISC.	8
2	**Central Processing Unit:**Introduction-Arithmetic Logic Unit - Fixed point arithmetic, floating point arithmetic-Execution of a complete instruction-Basic concepts of pipelining.	8
3	**Control Unit Design:** Introduction-Control Transfer-Fetch cycle - Instruction Interpretation & Execution - Hardwired control – Microprogrammed control.	7
4	**Memories And Subsystems :** Semiconductor memory - Static and Dynamic - Associative memory- Cache memory- Virtual memory- Secondary memories-Optical magnetic tape & magnetic disks & controllers.	8
5	**I/O Processing :**Introduction-Data transfer techniques- Bus Interface- I/O Channel-I/O Processor, I/O devices -Direct memory access.	7

Outcomes:	
On completion of the course, student will be able to–	
1	Understand Functions of CPU, Control unit, I/O Processing
2	Learn Memory and its types
3	Understand Memory organization and its types
Text Books	
1.Carl Hamacher,"*Computer Organization*",FifthEdition,McGrawHill International Edition, 2002	

Reference Book
1. P.PalChaudhuri, "*Computer Organization and Design*" , 2nd Edition, PHI ‘ 2003 2. William Stallings , “*Computer Organization and Architecture* – Designing for Performance”, PHI, 2004. 3. John P.Hayes, "*Computer Architecture and Organization*", III Edition, McGraw Hill International Editions, 1998.

Year: First Year **Semester – II**
Course: Discrete Mathematics **Course Code:** TYCE204

Teaching Scheme (Hrs. /Week)				Continuous Internal Assessment (CIA)				End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**Lab**	**Theory**	**Lab**	
3	1	0	4	20	20	10	--	50	--	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.								**End Semester Exam (Lab) – 00 Hrs.**		

Perquisites:
Basic Mathematics

Objectives:	
The course will enables students to learn:-	
1	Have knowledge of the concepts needed to test the logic of a program.
2	Have an understanding in identifying structures on many levels.
3	Be aware of a class of functions which transform a finite set into another finite sewhich relates to input output functions in computer science.
4	Be aware of the counting principles
5	Be exposed to concepts and properties of algebraic structures such as semigroups, monoids and groups.

Unit No	Details	Hours
1	**Logic And Proofs Propositional Logic**– Propositional equivalences-Predicates and quantifiers – Nested Quantifiers – Rules of inference-introduction to proofs – proof methods and strategy.	8
2	**Combinatorics**Mathematical induction – Strong induction and well ordering – The basics of counting - The pigeonhole principle – Permutations and combinations – Recurrence relations- Solving linear recurrence relations-generating functions – Inclusion and exclusion and applications.	8
3	**Graphs:**Graphs and graph models – Graph terminology and special types of graphs – presenting graphs and graph isomorphism – connectivity – Euler and Hamilton paths.	7
4	**Algebraic Structures :**Algebraic systems – Semi groups and monoids – Groups-Subgroups and homomorphisms – Cosets and Lagrange's theorem – Ring & Fields.	8
5	**Lattices And Boolean Algebra:**Partial ordering – Posets – Lattices as Posets – Properties of lattices-Lattices as algebraic systems – Sub lattices – direct product and Homomorphism – Some special lattices – Boolean algebra	8

Outcomes:	
On completion of the course, student will be able to–	
1	Solve real world problems logically using appropriate set, function, and relation models and

	interpret the associated operations and terminologies in context.
2	Analyze and synthesize the real world problems using discrete mathematics.
Text Books	
1. Kenneth H.Rosen, "Discrete Mathematics and its Applications", 6th Edition, SpecialIndianedition , Tata McGraw – Hill Pub. Co. Ltd., New Delhi, (2007). 2. Trembly J.P. and Manohar R, "Discrete Mathematical Structures with Applications toComputer Science", Tata McGraw–Hill Pub. Co. Ltd, New Delhi, 30th Re-print (2007).	
Reference Book	
1. Ralph. P. Grimaldi, "Discrete and Combinatorial Mathematics: An AppliedIntroduction", Fourth Edition, Pearson Education Asia, Delhi, (2002). 2. Thomas Koshy, "Discrete Mathematics with Applications", Elsevier Publications,(2006). 3. Seymour Lipschutz and Mark Lipson," Discrete Mathematics", Schaum'sOutlines,Tata McGraw – Hill Pub. Co. Ltd., New Delhi, 2007,Second edition, Fifth reprint,(2007).	

Year: First Year **Semester – II**
Course: Fundamentals of Computing **Course Code:** TYCE205

Teaching Scheme (Hrs. /Week)				Continuous Internal Assessment (CIA)				End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**Lab**	**Theory**	**Lab**	
3	0	2	4	20	20	10	--	50	--	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.								**End Semester Exam (Lab) – 00 Hrs.**		

Perquisites:
Computer Organization and Architecture

Objectives:	
The course will enables students to learn:-	
1	To learn basics of computer hardware.
2	To learn use of Open source operating system and compilers
3	To learn various programming language paradigms

Unit No	Details	Hours
1	**Program Development Concepts:** Fundamental building blocks of Computer, Operating System, Types of Software: - System Software and Application Software, Introduction to Algorithms, Characteristics of Algorithm, flowcharts. **Programming language tools:** Programming language tools (Editor, Compiler, Linker and Loader). Types of Editor, Types of Compiler. Program execution process.	8
2	**Introduction to Programming Languages:** Types of programming languages: - Machine Level, Assembly Level, High Level programming Languages, Procedure Oriented programming language and Object Oriented Programming Language. **C Programming Basics:** History of C programming. Data types in C, Variables, Constants, Keywords and Comments, Operators- assignment, arithmetic, relational, logical, increment and decrement, precedence of operators, type conversions, scanf and printf functions, Pre-processor Directives, Writing simpleprograms.	8
3	**Basic Input/output:** C operators and expressions. Introduction to decision control statements. Conditional branching statements. **Loop Control Structures:** Iterative statements. Nested loops. Break, continue and goto statements. Basic Input/output statements**. Structures** and Unions.	7
4	**Arrays and Strings:** Declaration and initialization of arrays, Accessing and storing values in arrays, Operations performed on arrays, One &Two-dimensional arrays, Arrays using Structures and Unions. **Strings:** Introduction to strings, Declaration and initialization of string, String operations with and without C library functions.	8
5	**Functions:** Introduction to functions, Function declaration and definition, **Parameter Passing** Function call and parameter passing, **Memory Management in C**	7

	Introduction to Static memory allocations, Dynamic memory allocation, **C Programming Files I/O:** Opening, Reading, Writing and Closing a file.	

Outcomes:	
On completion of the course, student will be able to–	
1	Understand types of open source softwares and their use
2	Learn different computer hardware components and its working
3	Differentiate between various programming languages

Text Books

1. YashavantKanetkar, "Let Us C", BPB Publications, 10/E,2010.
2. E. Balagurusamy, "Programming in ANSI C", Tata McGraw-Hill Education,4E

Reference Book

1. ReemaThareja, "Computer Fundamentals and Programming in C", OXFORD University Press,2012.
2. Stephen G Kochan "Programming in C", Pearson Education, 3/E, 2004.
3. Ashok N Kamthane, "Computer Programming", Pearson Education, 2/E,2008.
4. Vikas Gupta, "Computer Concepts and C Programming",Dreamtech Press,2009.
5. K R Venugopal and S R Prasad, "Mastering C", Tata McGraw Hill, 1/E, 2011.
6. Behrouz A Forouzan, Richard F Gilberg, "COMPUTER SCIENCE – A Structured Programming approach using C", Thomson, 3/E Indian Edition, 2007.
7. Kernighan, Ritchie, "The C Programming Language", Prentice Hall of India, 2/E,1988.
8. Pradeep K Sinha and PritiSinha, "Computer Fundamentals", BPB Publications, 4/E,2007.

Year: First Year **Semester – II**

Course: Applied Physics and ChemistryLab **Course Code:** TYCE206

Teaching Scheme (Hrs. /Week)				Continuous Internal Assessment (CIA)				End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**Lab**	**Theory**	**Lab**	
0	0	3	2	--	--	--	25	0	25	50
Max. Time, End Semester Exam (Theory) -00 Hrs.								**End Semester Exam (Lab) – 03 Hrs.**		

Prerequisites:
C++ Programming

Objectives:	
Students are able to:-	
1	
2	

Suggested List of Laboratory Assignments
1.

Year: First Year **Semester – II**

Course: Object oriented Programming Through C++ Lab **Course Code:** TYCE207

Teaching Scheme (Hrs. /Week)				Continuous Internal Assessment (CIA)				End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**Lab**	**Theory**	**Lab**	
0	0	3	2	--	--	--	25	0	25	50
Max. Time, End Semester Exam (Theory) -00 Hrs.								**End Semester Exam (Lab) – 03 Hrs.**		

Prerequisites:
C++ Programming

Objectives:	
Students are able to:-	
1	Have successful technical and professional careers in their chosen fields such as circuit theory, Field theory, control theory and computational platforms.
2	Engross in life long process of learning to keep themselves abreast of new developments in the field of Electronics and their applications in power engineering.

Suggested List of Laboratory Assignments

2. Create class Student having Roll No. and Name member variable and get_data () and put_data() member functions. Take values for member variables through member functions and print those values by calling member functions through object.
3. Create any one class and demonstrate the use of static member variable and static member functions.
4. Write a program to display name and age of five managers using array of objects.
5. Write a program to demonstrate the use of friend function within class.
6. Write a program containing Default Constructor, Parameterized Constructor, and Destructor
7. Write a program to sort the numbers in an array using separate functions for read, display, sort and swap.
8. Write a program to perform addition, subtraction, multiplication and division operations on complex numbers.
9. Write a program to implement database of persons using inheritance which have different profession e,g. engineer, doctor, student, laborer etc.
10. Write a program to perform addition, subtraction, multiplication and division operations on complex numbers using operator overloading.
11. Write a program using Constructors and destructors to implement Stack. Design the class for stack and the operations to be performed on stack.
12. Write a program in C++ to handle the “Divide by zero” exception.
13. Write a program in C++ using the open (), eof() and getline() member functions to open and read file content line by line.
14. Write a program in C++having class Number which has inline function mult() and cube() for calculating the multiplication of 2 double numbers given and cube of the integer number given.

Year: First Year **Semester – II**

Course: Fundamentals of ComputingLab Course Code: TYCE207

Teaching Scheme (Hrs. /Week)				Continuous Internal Assessment (CIA)				End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**Lab**	**Theory**	**Lab**	
0	0	3	2	--	--	--	25	0	25	50
Max. Time, End Semester Exam (Theory) -00 Hrs.								**End Semester Exam (Lab) – 03 Hrs.**		

Prerequisites:
C++ Programming

Objectives:	
Students are able to:-	
1	
2	

Suggested List of Laboratory Assignments
15.

Common to All

Year: First Year **Semester: II**

Course: Applied Physics & Applied Chemisry **Course Code:**

Teaching Scheme (Hrs/Week)				Continuous Internal Assessment (CIA)					End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**		**Lab**	**Theory**	**Lab**	
3	0	2	4	20	20	10		50	50	-	150
Max. Time, End Semester Exam (Theory) -3Hrs.											

Prerequisite	1. Introduction and basic concepts of derivative and integration of functions. 2. Basic concepts andmethods to solve simultaneous equations, quadratic equations.

Course Objectives	
1	To solve System of linear equations using matrix methods.
2	To understand partial differentiation with their applications stationary values arising in engineering optimization problems.
3	To solve ordinary differential equations
4	To understand the basic concepts of statistics and probability

Course Content			
Unit No.	Module No.	Content	Hours
1	I	**LASER** Laser - introduction, difference between ordinary source of light and laser. Properties of laser, Absorption, spontaneous and stimulated emission, population inversion, pumping and types of pumping. Active medium, Components of laser. Three level and four level system, Ruby laser, He-Ne laser, Applications of laser industrial, medical etc. Holography.	8
2	II	**Semiconductor physics** Introduction to formation of energy bands in solids. Classification of solids, electrical conductivity in conductor and semiconductors. Influence of external factors on conductivity (temperature, impurity), Hall effect.	6
3	III	**Superconductivity** : properties of superconductor, Meissner effect, isotope effect, persistent current, critical current density, critical magnetic field,BCS theory of superconductivity, type-I and type-II superconductors. DC and AC Josephson effect, SQUIDS, application of superconductivity like magnets, transmission line, levitation, etc.).	6

4	IV	UNIT-I : WATER TECHNOLOGY Boiler problems- scale, sludge, priming, foaming, caustic embritlment, and corrosion, causes, preventions, and disadvantages. Water softening processes (external and internal treatment methods) – Zeolite process, Ion exchange method, Desalination, Reverse osmosis & Electrodialysis. Phosphate conditioning, colloidal conditioning, calgon conditioning for boiler feed water.	10
5	V	UNIT III: POLYMER Degree of polymerisation, classification of polymers based on sources, composition, structure etc., Types of polymerisation- addition and condensation polymerisation, free radical mechanism of addition polymerisation. compounding of plastics, glass transition temperature and factors affecting it. Important polymers- Preparation, properties and Engineering uses. Thermoplastics, Thermosetting plastics, polythene (LDPE and HDPE), Polycarbonate,Nylon-6,Nylon-66, , Rubber, processing of natural rubber, vulcanization of rubber, synthetic rubber, Natural and synthetic rubber.	10
		Total No. of Hrs	40

Beyond the Syllabus

Course Outcome	
Students should able to	
CO1	Student will able to understand basics involved in lasers.
CO2	Student will able to classify solids, will understands the concepts involved in conductivity.
CO3	Student will be able to understand basic concepts of superconductivity.
CO4	Student will be able to understand impurities in water and their treatment methods.
CO5	Student will be understand preparation, properties and applications of some polymers.

List of Experiments
1. To determine the wavelength of laser by using plane diffraction grating
2. To Determine the sound absorption coefficient
3. To study Hall effect
4. To determine band gap of semiconductor
5. Identify and determination of type and amount of alkalinity in given water sample
6. Performing titration of Strong acid Vs Weak base by using PH Meter
7. Determining Hardness of given water sample By EDTA method
8. Preparation of phenol formaldehyde resin .

RecommendedResources	
Text Books	1. A text book of Engg. Physics by M. N. Avadhalula and P. G. Kshirsagar, S.

	Chand Pub. 2. Engg. Physics by Abhijit Nayak, S. K. Kataria and sons Pub. 3. R. K. Gaur and S.C. Gupta, 'Engineering Physics' Dhanpat Rai Publications, New Delhi(2003) 4. A Text book of Engineering Chemistry by Dr S S Dara, Dr S S Umare, S Chand & company Ltd. 5. Engineering Chemistry - Sunita Rattan 6. Engineering Chemistry, K. Shesha Maheshwari, Mridula Chug, Pearson,2018
Reference Books	1. Engineering Physics, malik and singh, Tata Mc Graw Hill . 2. A textbook of engineering Physics, Pillai, sivakami, new age International, limited 3.Corrosion Engineering ,Fontenna & Greene 4. Chemistry, Raymond Chang. (Tata McGraw Hill).
E-Resources	

SANDIP UNIVERSITY

School of Engineering and Technology

Common to All

Year: First Year **Semester:I**

Course: English Communication Skill (HSS) **Course Code: 17YHS111**

Teaching Scheme (Hrs/Week)				Continuous Internal Assessment (CIA)					End Semester Examination		Total
L	**T**	**P**	**C**	**CIA-1**	**CIA-2**	**CIA-3**	**CIA-4**	**Lab**	**Orals**	**Lab**	
2	-	2	3	10	20	10	10	-	50	-	100
Max. Time,End Semester Exam									**End Semester Orals –1 Hr.**		

Prerequisite	1. Functional grammar-Parts of speech, Tenses, Sentence pattern
	2. Formal letter
	3. Fluency in reading and speaking

Course Objectives	
1	To acquire basic language skills (LSRW) to communicate with speakers of English language.
2	To develop their intellectual, personal and professional abilities.
3	To develop skill to communicate fluently.
4	To enhance team building and time management skills.
5	To inculcate employability skills among students.

Course Content			
Unit No.	Module No.	Content	Hours
1	I	**English Vocabulary building:** Affixes, Prefixes & Suffixes	3
	II	Word building- Compound words, Standard Abbreviations	2
	III	Antonyms and Synonyms- functional usage	2
	IV	Active & Passive voice	2
2	I	**Writing skills:** Parts of speech	3
	II	Paragraph writing	2
	III	Use of Idioms, Phrases and Proverbs in sentences	2
	IV	Basic sentence pattern	1
	V	Importance of punctuation	1
3	I	**CALL- Computer Assisted Language Laboratory** Listening exercises- Extempore	4
	II	Vocabulary building -Task based Lab Activities	5
	III	Language fluency Linguistic accuracy & Communicative fluency	5

	IV	Listening to varied registers-Role play - Situational Dialogues	2
	V	Pronunciation, Intonation, Stress and Rhythm- Public speaking	4
4	I	**Oral & Written Presentation** Tenses	2
	II	Ice breaking, reporting, Question & answer skill	2
	III	Formal & Informal speech	3
		Total No. of Hrs	45

Beyond the Syllabus
Self Introduction, SWOT/SWOC, Group Discussion

Course Outcome	
Students should able to	
CO1	Students will acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.
CO2	Students will be able to write formal letters effectively.
CO3	Students will be able to prepare, organize and deliver oral presentation.
CO4	Students will develop reading speed and build academic vocabulary.
CO5	Students will demonstrate behavior and attitudes appropriate to university environment.

List of Experiments	
Sr. No.	**Description**
1	**Module 1** **CALL- Computer Assisted Language Laboratory** Listening exercises- Extempore
2	**Module 2** Vocabulary building -Task based Lab Activities
	Module 3 Language fluency Linguistic accuracy & Communicative fluency
	Module 4 Listening to varied registers-Role play - Situational Dialogues
	Module 5 Pronunciation, Intonation, Stress and Rhythm- Public speaking

RecommendedResources	
Text Books	1. Communication Skills by Sanjay Kumar and PushpaLata, Oxford University Press. 2. Developing Communication Skill by Krishna Mohan, MeeraBanerji, McMillan India Ltd. 3. English for Business Communication by Simon Sweeney, Cambridge University Press. 4. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press
Reference Books	1. Ethics in Engineering Practice and Research by Caroline &Whitbeck, Cambridge University Press. 2. Basic Managerial Skills by E. H. McGrath, Eastern Economy Edition, Prentice hall India. 3. Change Your Thoughts; Change Your Life by Wayne Dyer, Hay House India, ISBN-139788189988050. 4. The Power of Your Subconscious Mind by Dr Joseph Murphy MaanuGraphics , ISBN-13 9789381529560. 5. Baltra, A. (1986). "Computer assisted language learning: What is it all about?" Paper presented at a conference at the University of California, Irvine. 6. Jones, C. (1986). It's not so much the program, more what you do with it: The importance of methodology in CALL. "System, 14"(2), p.171-78. 7. Rivers, W. (Ed.). (1987) "Interactive language teaching." NY: Cambridge University Press.
E-Resources	https://www.britishcouncil.in/sites/default/files/esfe_report.pdf https://www.britishcouncil.org/sites/default/files/english-soft-skills-maghreb-research-report.pdf http://nptel.ac.in/courses/109104030/references/references.pdf http://promeng.eu/downloads/training-materials/ebooks/soft-skills/effective-communication-skills.pdf