SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

B. Tech CSE (with specialization in Internet of Things)

Semester – V

Sr. No.	Core	Course Code	Course Name	Teaching Scheme (Hrs./Week)				Examination Scheme				Total Marks
				L	T	P	C	Formative Assessment CIA		Summative Assessment ESE		
								Course	Lab	Course	Lab	
1	PC	YCI501	Formal Languages and Automata Theory	3	1	--	4	50	--	50	--	100
3	PC	YCI502	Microprocessor and microcontroller	3	--	--	3	50	--	50	--	100
4	PC	YCI503	Programing with Python	3	--	--	3	50	--	50	--	100
5	PC	YCI504	Operating System	3	--	--	3	50	--	50	--	100
6	PC	YCI511	Dynamic Paradigm in Internet of Things 3	--	--	2	1	--	25	--	--	25
7	PC	YCI512	Microprocessor and microcontroller Lab	--	--	4	2	--	25	--	25	50
8	PC	YCI513	Programing with Python Lab	--	--	4	2	--	25	--	25	50
9	UC	YCI514	Seminars And Technical Communications	--	--	2	1	--	50	--	--	50
10	UC	YCI515	Industry Internship	--	2	--	2	--	25	--	--	25
11	UC	YFF501/ YFG502	Foreign Language (French II / German II)	2	--	--	2	50	--	50	--	100
TOTAL				**14**	**03**	**12**	**23**	**250**	**150**	**250**	**50**	**700**

CIA: Continuous Internal Assessment	#: Internship for 15 days.	**CIA**	**Weightage**	**Description**
L: Theory Lecture	*: Oral Examination	CIA 1	10%	Home Assignment
T: Tutorial	**UC**: University Core	CIA 2	20%	Mid-Term Exam (MTE)
P: Practical	**PC**: Programme Core	CIA 3	10%	Seminar Presentation
TH: Theory Exam.	**PE**: Programme Elective	CIA 4	10%	Research Based Activity
		TOTAL	**50%**	

Note:
YCI 511 – Industry Export form IBM (Hands on Experience - Every Student must submit a Report on the same technical topic)
YCI515 - After 4th Semester Maximum of Three weeks, Student must submit a Report.

Document Reference	Revision No. / Date	Prepared By	Approved By
SUN/SOCSE/BTECH/IoT/2019	R1 / 20 August 2019		

SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – V**

Course: Formal Languages And Automata Theory **Course Code: YCI501**

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	Theory	Lab	
3	1	-	4	10	20	10	10	-	50	-	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.									End Semester Exam (Lab) – 00 Hrs.		

Prerequisites:
Turing Machine, Logic

Objectives:	
The course will enables students to:-	
1	Classify machines by their power to recognize languages.
2	Employ finite state machines to solve problems in computing.
3	Explain deterministic and non-deterministic machines.
4	Comprehend the hierarchy of problems arising in the computer sciences.

Unit No	Details	Hours
1	**Module 1:** Fundamentals: Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers.	4
	Module 2: Finite Automata: NFA with Î transitions - Significance, acceptance of languages. Conversions and Equivalence: Equivalence between NFA with and without Î transitions, NFA to DFA conversion, minimization of FSM, equivalence between two FSM's, Finite Automata with output- Moore and Melay machines.	4
2	**Module 1:** Regular Languages: Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets (proofs not required).	4
	Module 2: Grammar Formalism: Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, and sentential forms. Right most and leftmost derivation of strings.	3
3	**Module 1:**Context Free Grammars : Ambiguity in context free grammars. Minimization of Context Free Grammars. Chomsky normal form, Greibach normal form, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL (proofs omitted).	4
	Module 2: Push Down Automata: Push down automata, definition, model,	4

	acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, interconversion. (Proofs not required). Introduction to DCFL and DPDA.	
4	**Module 1:**Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages.	4
	Module 2: Church's hypothesis, counter machine, types of Turing machines (proofs not required). Linear bounded automata and context sensitive language.	3
5	**Module 1:**Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR(0) grammar, decidability of, problems,	4
	Module 2: Universal Turing Machine, undecidability of posts. Correspondence problem, Turing reducibility, Definition of P and NP problems, NP complete and NP hard problems.	4

Outcomes:	
On completion of the course, student will be able to–	
1	Master regular languages and finite automata.
2	Master context - free languages, push - down automata, and Turing recognizable languages.
3	Be exposed to a broad overview of the theoretical foundations of computer science.
4	Be familiar with thinking analytically and intuitively for problem - solving situations in related areas of theory in computer science.

Text Books

1. "Introduction to Automata Theory Languages and Computation". Hopcroft H.E. and Ullman J. D. Pearson Education
2. Introduction to Theory of Computation – Sipser 2nd edition Thomson.

Reference Book

1. Introduction to Formal languages Automata Theory and Computation Kamala Krithivasan Rama R.
2. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
3. Theory Of Computation: A Problem - Solving Approach, Kavi Mahesh, Wiley India Pvt. Ltd.
4. "Elements of Theory of Computation", Lewis H.P. &Papadimition C.H. Pearson /PHI.
5. Theory of Computer Science – Automata languages and computation -Mishra and Chandrashekaran, 2nd edition, PHI.

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School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – V**

Course: Microprocessor & Microcontroller **Course Code: YCI502**

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	Theory	Lab	
3	1	0	4	10	20	10	10	--	50	--	100
Max. Time, End Semester Exam (Theory) -3Hrs.									End Semester Exam (Lab) - 2Hrs.		

Prerequisites:
Basic knowledge of computer organization.

Objectives:	
Students are able to:-	
1	Explain architecture and operation of Microprocessor and Microcontroller.
2	Develop assembly and C-language program & its execution on microprocessor and microcontroller.
3	Develop Interfacing of various peripheral devices to microcontroller.

Unit No	Details	Hours
1	Module 1: 8085 Microprocessor: Hardware Architecture, pin outs – Functional Building Blocks of Processor	3
	Module 2: Memory organization – Timing Diagram – Interrupts.	3
2	Module 1: 8086 Microprocessor Architecture, Queue, Segmentation, Physical Address generation, pin out, minimum and maximum mode, addressing modes	4
	Module 2: Instruction set – Data transfer, data manipulation & control instructions – Programming: Loop structure with counting & Indexing – Look up table.	4
3	Module 1: 8051 Microcontroller Hardware Architecture, pin outs – Memory organization	4
	Module 2: I/O ports –Timers – Interrupts-Comparison with Microcontroller.	4
4	Module 1: Microcontroller Programming Arithmetic, logical, Port, delay calculation	4
	Module 2: Timer, Serial Communication Programming using C language.	4
5	Module 1: Interfacing with Microcontroller Programming 8051 Timers – Serial Port Programming – Interrupts Programming – LED interfacing- key interfacing-Relay Interfacing - LCD interfacing	4
	Module 2: Keyboard Interfacing –, ADC, DAC interfacing- Waveform generation using DAC, Stepper Motor interfacings. Applications -Water level controller, Traffic light control, Temperature measurement.	4

Outcomes:	
At the end of this course students will be able to:-	
1	Explain internal architecture of 8085, 8086 and 8051.
2	Develop and execute assembly and C language program for 8086 and 8051.
3	Select appropriate microprocessor and microcontroller to meet specific requirements.
4	Interface external devices to 8051 microcontroller.
Text Books	
1- Microprocessors and its interfacing by Duglus V. Hall	

2- The Intel Microprocessors - Architecture, Programming and Interfacing by B.B. Brey
3- The 8051 microcontroller and Embedded system by Mazidi, Mazidi and McKinlay
4- 8051 Microcontroller by Kenneth J. Ayala.

Reference Books

1- Microprocessors architecture, programming and applications with 8085 by R.S. Gaonkar.
2- Microprocessors and Microcontrollers by S.K. Mandal.
3- Fundamentals of microprocessors and microcontrollers by B.Ram.
4- Programming and customizing 8051 microcontroller by Myke Predko. .

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School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – V**

Course: Programing with Python **Course Code: YCI503**

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	Theory	Lab	
3	-	-	3	10	20	10	10	--	50	--	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.									End Semester Exam (Lab) – 00 Hrs.		

Prerequisites:
C Programing, C++ Programing

Objectives:	
The course will enables students to:-	
1	Understands programing fundamentals
2	Know basics of python
3	Understand use of python library for complex problem solving

Unit No	Details	Hours
1	**Module 1: Introduction to Python** What is Python, Where is it used, Pros and Cons, Python Version 2, Version 3, Python Installing on Windows & on Linux and Mac OS	4
	Module 2:Data Types & Operators Numerics (int, complex and float), Boolean (and, or , not), Strings, List, Tuples, Dictionaries,Relational Operators (or Comparisons) >, >= <,<=, !, !=, is not, Datetime(), Calendar(),Collections(), Heapq. s.replace(), s.find(), s.split(), s.alpha() and more …	4
2	**Module 1: Files, Directories, Regular Expressions & Flow Controls** Path(), Stat(), Filecmp(), Glob(), Shutil(),. replace (), sub(), search(), Pattern matching. if, then,else, while, If, elif, for loop, Iterators, range.	4
	Module 2:Functions, Python OS Module functions, Parallel Processing and spawning processes Creating Isolated Environment- Virtualenv(), Creating processes using fork(), and exec(),Listing current working directory, current OS, Listing files in directories, and other os functions..Syntax, Calling functions, Returning from functions, Pass by Reference and Value, Functionsarguments.	3
3	**Module 1: Exception Handling, Object Oriented Programming & Standard and other Libraries** Try, except, else: Try, finally, Raising exceptions. Instantiating Classes, Serialising PythonObjects.	4
	Module 2: Data Compression and Archiving (zip, gzip, bz2, zipfile).	4
4	**Module 1: Web development, Network Programming & Extending and Embedding Python in other programming languages**	4

	HTTP web services (http.client()). Introduction to Socket Module and Functions (connect, bind, listen, accept, send/recv),	
	Module 2: Sample Client and Server Examples. Creating extensions withand without third party tools.	3
5	**Module 1: Python in IoT , Scientific and DB programming in Python (installation and beginner samples), numpy (Installation and Use cases) and Pandas: Data Processing module** Raspberry, Paho-mqtt. Mysqldb(Installation, Use cases), Opencv (Installation, GUI Features and Videos), MatPlotlib (Includes installation, Examples of 2D plots, Colors, Text, Introduction to APIs).	4
	Module 2: Pandas - Overview, setup, Data Structures, Indexing and Selected data, Reshaping Data, Grouping.	4

Outcomes:	
On completion of the course, student will be able to–	
1	Understands programing fundamentals
2	Know basics of python
3	Understand use of python library for complex problem solving
Text Books	
Programing with python (IBM ICE Publication)	
Reference Book	
http://www.python.org https://www.tutorialspoint.com/python/python_pdf_version.htm https://www.python-course.eu/python3_deep_copy.php https://www.safaribooksonline.com/library/view/learning-python-5th/9781449355722/ http://shop.oreilly.com/product/0636920028154.do https://www.guru99.com/python-tutorials.html IPython : https://ipython.org/documentation.html REPL : https://repl.it/repls Extending and Embedding Python : https://docs.python.org/3/extending/index.html#extending-index Places where we can get free data: https://visual.ly/blog/data-sources/	

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School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – V**

Course: Operating System **Course Code: YCI504**

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	Theory	Lab	
3	-	-	3	10	20	10	10	--	50	--	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.									End Semester Exam (Lab) – 00 Hrs.		

Prerequisites:
DDCO

Objectives:	
The course will enables students to:-	
1	To understand main components of OS and their working.
2	To study the operations performed by OS as a resource manager.
3	To understand the different scheduling policies of OS.
4	To understand the different memory management techniques.
5	To understand process concurrency and synchronization.
6	To understand the concepts of input/ output, storage and file management.

Unit No	Details	Hours
1	**Module 1:** Introduction and history of Operating systems, structure and operations; processes and files	4
	Module 2: Processor management: inter process communication, mutual exclusion, semaphores, wait and signal procedures, process scheduling and algorithms, critical sections, threads, multithreading	4
2	**Module 1:** Memory management contiguous memory allocation, virtual memory, paging, page table structure	4
	Module 2: demand paging, page replacement policies, thrashing, segmentation, case study	3
3	**Module 1 :** Deadlock: Shared resources, resource allocation and scheduling, resource graph models	4
	Module 2: deadlock detection, deadlock avoidance, deadlock prevention algorithms	4
4	**Module 1:** Device management: devices and their characteristics, device drivers	4
	Module 2 : device handling, disk scheduling algorithms and policies	3
5	**Module 1:** File management: file concept, types and structures, directory structure, cases studies, access methods and matrices	4
	Module 2: file security, user authentication.	4

Outcomes:

On completion of the course, student will be able to–	
1	Apply optimization techniques for the improvement of system performance.
2	Ability to understand the synchronous and asynchronous communication mechanisms in their respective OS.
3	Learn about minimization of turnaround time, waiting time and response time and also maximization of throughput with keeping CPU as busy as possible.
4	Ability to compare the different OS

Text Books

1. Operating System Principles, Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8th Edition, Wiley Student Edition.
2. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.

Reference Book

1. Silberschatz& P.B. Galvin, 'Operating System concepts and principles', Wiley India, 8th ed., 2009.
2. Tanenbaum, 'Modern Operating Systems', Prentice Hall India, 2003
3. W. Stallings, 'Operating Systems: Internals and designPrinciples', Pearson Ed., LPE, 6th Ed., 2009.
4. M.J. Bach, 'Design of Unix Operating system', Prentice Hall, 1986.

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School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – V**

Course: Dynamic Paradigm in Internet of Things 3 **Course Code: YCI511**

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	Theory	Lab	
-	-	2	1	--	--	--	--	25	--	--	25
Max. Time, End Semester Exam (Theory) -00 Hrs.									End Semester Exam (Lab) – 00 Hrs.		

Prerequisites:
Computer Organization

Objectives:	
The course will enables students to:-	
1	Learn how to analyze multidimensional data properly.
2	Understand the role of formal statistical theory and informal data warehouse methods.

Guidelines for Assessment

Continuous assessment of laboratory work is done based on overall performance and lab assignments performance of student. Each lab assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each lab assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.

Guidelines for Laboratory Conduction

The instructor is expected to frame the assignments by understanding the prerequisites, technological aspects, utility and recent trends related to the topic. The assignment framing policy need to address the average students and inclusive of an element to attract and promote the intelligent students. The instructor may set multiple sets of assignments and distribute among batches of students. It is appreciated if the assignments are based on real world problems/applications. Encourage students for appropriate use of Hungarian notation, Indentation and comments. Use of open source software is encouraged.

In addition to these, instructor may assign one real life application in the form of a mini-project based on the concepts learned. Instructor may also set one assignment or mini-project that is suitable to respective branch beyond the scope of syllabus.

Operating System recommended : 64-bit Open source Linux or its derivative

Programming tools recommended: Open Source C Programming tool like GCC

Suggested List of Laboratory Assignments

Seminars and Webinars conducted by IBM ICE trainer

SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year | Semester – V

Course: Microprocessor & Microcontroller Lab | Course Code: YCI512

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	Theory	Lab	
0	0	4	2	--	--	--	--	25	--	25	50
Max. Time, End Semester Exam (Theory) -00 Hrs.									End Semester Exam (Lab) – 03 Hrs.		

Prerequisites:
Computer programming

Objectives:	
Students are able to:-	
1	Understand the basics of Microprocessor and Microcontroller.
2	Develop and execute assembly and C- language programs for microprocessor and microcontrollers.
3	Develop interfacing of different types of peripherals.

Guidelines for Assessment
Continuous assessment of laboratory work is done based on overall performance and lab assignments performance of student. Each lab assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each lab assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.
Guidelines for Laboratory Conduction
The instructor is expected to frame the assignments by understanding the prerequisites, technological aspects, utility and recent trends related to the topic. The assignment framing policy need to address the average students and inclusive of an element to attract and promote the intelligent students. The instructor may set multiple sets of assignments and distribute among batches of students. It is appreciated if the assignments are based on real world problems/applications. Encourage students for appropriate use of Hungarian notation, Indentation and comments. Use of open source software is encouraged. In addition to these, instructor may assign one real life application in the form of a mini-project based on the concepts learned. Instructor may also set one assignment or mini-project that is suitable to respective branch beyond the scope of syllabus. Set of suggested assignment list is provided in three groups. Each student must perform at least 13 assignments as at 05 compulsory from group A, 07 from group B and 01 from group C Operating System recommended : 64-bit Open source Linux or its derivative Programming tools recommended: Open Source C Programming tool like GCC, Keil, MASM. Flash Magic.

Suggested List of Laboratory Assignments
Group A (Compulsory Assignments)
6. Develop and execute an ALP for basic mathematic operations on 16 bit Nos. 7. Develop and execute an ALP for 8086 to arrange five 16 bit numbers in ascending / descending order. 8. Develop and simulate a C language program for 8051 to perform arithmetic operations 9. Develop and simulate a C language program for input, output operations using 8051 ports. 10. Interface 8051 to PC and write a C language program for serial transmission and reception using interrupt.
Group B (Any 7)
11. Develop and execute an ALP for 8086 to perform logical operations on 16 bit Nos. 12. Develop and execute an ALP for 8086 to find maximum from five 16 bit Nos. 13. Develop and execute an ALP for 8086 to convert hexadecimal number into decimal number. 14. Develop and simulate a C language program for 8051 to perform logical operations. 15. Develop and simulate a C language program for 8051 to convert decimal number into ASCII number. 16. Interface a LED to 8051 and write a C language program to blink it using software delay and delay by internal timer. 17. Interface a push to on key and LED to 8051 and write a C language program to read the key press and make LED ON and OFF. 18. Interface a relay to 8051 and write a c language program to make it ON and OFF. 19. Interface a 16 x 2 LCD to 8051 and write a C language program to display a message on it. 20. Interface a matrix keyboard and LCD to 8051 and write a C language program to print a key press on LCD.
Group C (Any 1)
3. Develop a traffic light control system using 8051 microcontroller. 4. Develop a liquid level control system using 8051 microcontroller.

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School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – V**

Course: Programing with Python Lab **Course Code:YCI513**

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	Theory	Lab	
0	0	4	2	--	--	--	--	25	--	25	50
Max. Time, End Semester Exam (Theory) -00 Hrs.									End Semester Exam (Lab) – 03 Hrs.		

Prerequisites:
C Programing, C++ Programing

Objectives:	
Students are able to:-	
1	Understands programing fundamentals
2	Know basics of python
3	Understand use of python library for complex problem solving

Guidelines for Assessment

Continuous assessment of laboratory work is done based on overall performance and lab assignments performance of student. Each lab assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each lab assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.

Guidelines for Laboratory Conduction

The instructor is expected to frame the assignments by understanding the prerequisites, technological aspects, utility and recent trends related to the topic. The assignment framing policy need to address the average students and inclusive of an element to attract and promote the intelligent students. The instructor may set multiple sets of assignments and distribute among batches of students. It is appreciated if the assignments are based on real world problems/applications. Encourage students for appropriate use of Hungarian notation, Indentation and comments. Use of open source software is encouraged.

In addition to these, instructor may assign one real life application in the form of a mini-project based on the concepts learned. Instructor may also set one assignment or mini-project that is suitable to respective branch beyond the scope of syllabus.

Operating System recommended : 64-bit Open source Linux or its derivative
Programming tools recommended: Open Source C Programming tool like GCC

Suggested List of Laboratory Assignments

Assignment List will be provided by IBM ICE trainer

SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – V**

Course: Seminars And Technical Communications **Course Code: YCI514**

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	Theory	Lab	
--	--	2	1	--	--	--	--	50	--	--	50
Max. Time, End Semester Exam (Theory) -03 Hrs.									End Semester Exam (Lab) – 00 Hrs.		

Objectives:	
Students are able to:-	
1	To expose students to the 'real' working environment and get acquainted with the organization structure, business operations and administrative functions.
2	To set the stage for future recruitment by potential employers.

Unit No	Details	Hours
1	**Course (catalog) description:** As a part of the B. Tech Curriculum, SEMINAR is a Practical course, in which the students of CSE are trained for presentation skills. **Course Guidelines:** **Grading:** **The Course is graded based on:** **Presentation : 50%** **Student's reports : 20%** **PPT presentation : 25%** **Attendance : 05%** **Note**: Presentation will take place in the weekly class. The presentation is evaluation by your class in charge. Report must be submitted during presentation. The report evaluation is done by your class in charge. A Viva voce comprising a comprehensive questions based on your presentation. **Etiquette :** Dress properly Behave well Portray good image as a university student Be punctual Observe work ethics Concern for safety Be professional	

Outcomes:	
On completion of the course, student will be able to–	
1	An ability to work in actual working environment.
2	An ability to utilize technical resources.
3	An ability to write technical documents and give oral presentations related to the work completed.

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Department of Computer Science and Engineering

Year: Third Year **Semester – V**

Course: Industry Internship **Course Code: YCI515**

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	Theory	Lab	
--	--	2	2	--	--	--	--	25	--	--	25
Max. Time, End Semester Exam (Theory) -03 Hrs.									End Semester Exam (Lab) – 00 Hrs.		

Objectives:	
Students are able to:-	
1	To expose students to the 'real' working environment and get acquainted with the organization structure, business operations and administrative functions.
2	To set the stage for future recruitment by potential employers.

Unit No	Details	Hours
1	Course (catalog) description: As a part of the B. Tech Curriculum, **Industry Internship** is a Practical course, in which the students of CSE are trained for presentation skills. Grading: The Course is graded based on: Presentation : 50% Student's reports : 50% **Employers Expectations:** Source of highly motivated pre professionals. Students bring new perspectives to old problems. Visibility of your organization is increased on campus. Quality candidates for temporary or seasonal positions and projects. Freedom for professional staff to pursue more creative projects. Flexible, cost effective work force not requiring a long term employer commitment. Proven, cost effective way to recruit and evaluate potential employees. Your image in the community is enhanced as you contribute your expertise to the educational enterprise	

Outcomes:	
On completion of the course, student will be able to–	
1	An ability to work in actual working environment.
2	An ability to utilize technical resources.
3	An ability to write technical documents and give oral presentations related to the work completed.

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School of Computing Science and Engineering

Department of Computer Science and Engineering

STUDENT EVALUATION OF INDUSTRY INTERNSHIP

Please respond to the following questions regarding your internship experience.

The purpose of this form is to provide opportunity for an honest appraisal of the internship site and supervisor.

Organization: _____

Semester/Year:_____

Location: _____

Supervisor: _____

1. Please rate the following aspects of your internship placement on the basis of this scale:

(0) No Observation, (1) Poor, (2) Fair, (3) Good, (4) Excellent

- Work experience relates to my career goals
- Adequacy of employer supervision
- Helpfulness of supervisor
- Acceptance by fellow workers
- Opportunity to use my training
- Opportunity to develop my human relations skills
- Provided levels of responsibility consistent with my ability and growth
- Opportunity to develop my communication skills
- Opportunity to develop my creativity
- Cooperativeness of fellow workers
- Opportunity to problem solve
- Opportunity to develop critical thinking skills
- Provided orientation to the organization
- Attempt to offer feedback on my progress and abilities
- Effort to make it a learning experience for me

Feel free to explain any of your responses to the above criteria here (use other side if necessary):

2. Would you work for this supervisor again? ___ Yes ___ No ___ Uncertain

3. Would you work for this organization again? ___ Yes ___ No

Uncertain

4. Would you recommend this organization to other students? ___ Yes ___ No ___ Uncertain

Why or why not?

5. Your Name: _____ Date: _____

Document Reference	Revision No. / Date	Prepared By	Approved By
SUN/SOCSE/BTECH/IoT/2019	R1 / 20 August 2019		

SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – V**

Course: French II **Course Code: YFF501**

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	Theory	Lab	
2	-	-	2	10	20	10	10	--	50	--	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.									End Semester Exam (Lab) – 00 Hrs.		

Objectives:	
The course will enables students to:-	
1	To enable the students to read and inform timing to make an appointment dialogue.
2	To enable the students to learn about French cuisine, food items. Dialogue making at restaurant.
3	To enable the students to draft mail, accept or reject the invitation of formal or informal gathering.
4	To enable aspirant to communicate the past events with help of passecomposee [simple perfect tense].
5	To enable the students to talk/write about events that have happened – the introduction of the perfect tense.

Unit No	Details	Hours
1	**Module 1:** Agenda making in French , making an appointment Grammar : aller ,and reflexive verbs regular, irregular [se lever,se laver etc]	4
	Module 2: Prepositions: a ,dans ,chez ,a cote de usage in the sentence. Vocabularyrelated to places .	4
2	**Module 1:** **1.**Talk about free time activities 2. Excursion to paris and french vacation culture	4
	Module 2: Grammar Faire verb General question with wh /interrogative adjectives [quel/quelle]. Writing skills draft inviation about excursion./ dialogue: telephonic conversion about picnic avenues in france.	3
3	**Module 1 :** Explorer l'inconnu [explore well known places] Transportation mode, talk about payment, currency etc.	4
	Module 2: Dialogue making 1. At airport	4
4	**Module 1:** Dialogue making Reservation of hotel rooms	4
	Module 2:	3

	Dialogue making Ticket purchase at metro station.	
5	**Module 1:** Vocabulary Parts of house, describe my house, different housing pattern, furniture and interior	4
	Module 2: Grammar Irreguler adjectives. Preposition usage, past tense	4

Internal Assessment:
CIA1 : Students Will Shoot A Short Film / Introduction For Video Conference CIA2A Receptive Task: Reading Skills And Mock Test With French Accent Mark Writing Task. CIA2B: Productive Task: Write About My Collegue/My Friend/Family Memberetc. CIA3: Picture Description In French CIA4: The Students Will Research Into French Food /Wine Culture Options In Regional Zone And Make A Presentation On The Topicin The Format Of Their Choice.
Text Books
1. Saison methode de francais a1 2. Alter ego a1 3. apprenons le francais [2,3,4,] 4. Tricolor 2,3 All books are available by goyalsaabdelhi , oxford publication, DIDIER PUBLICATION FOR delf /dalf exam preparation
Reference Book
All the audio available on www.didierfle.com/saison didierfle.com/saison

SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – V**

Course: German II **Course Code: YFG502**

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	Theory	Lab	
2	-	-	2	10	20	10	10	--	50	--	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.									End Semester Exam (Lab) – 00 Hrs.		

Objectives:	
The course will enables students to:-	
1	To enable the students to read and tell the time (formally and informally) and make an appointment
2	To enable the students to order food and drink in a restaurant, understand information about events in the city
3	To enable the students to talk/write about their learning preferences – when, how, with what aids
4	To enable the students to talk/write about their dwelling- house/apartment
5	To enable the students to talk/write about events that have happened – the introduction of the perfect tense

Unit No	Details	Hours
1	**Module 1:** DAILY ROUTINE Speech intentions: 1. Understand and state clock timings 2. Fix appointments 3. Speak about the family 4. Arrange a meeting or a date 5. Apologies for being late 6. Make an appointment on the phone	4
	Module 2: Vocabulary: 1. Clock timings, daily routine 2. Fix appointments	4
2	**Module 1:** Grammar: 1. timings with prepositions like am, um ,von.... Bis 2. Possessive pronouns (mein, dein) 3. Modal auxilaries in a sentence (können, müssen and wollen Telephone conversation, listening comprehension; Revision of self-introduction	4
	Module 2: TIME WITH FRIENDS Speech intentions	3

3	**Module 1**CONTACTS Speech intentions **1. A**rrange an appointment **2. U**nderstand a manual **3.U**nderstand simple letters/emails and answer them **4.S**peak about learning languages **5. F**ind information in texts **6. U**nderstand dialogues and make dialogues	4
	Module 2: Vocabulary **1.** work routine **2.** Telephone **3.** letter formalities **4.** language learning Grammar **1.** Prepositions with the Dative case **2.** Articles in the Dative case	4
4	**Module 1:GutenAppetit! (Enjoy your meal)** MY HOUSE Speech intentions **1.** Understand ads about apartments **2.** Describe an apartment **3.** Draw and explain an apartment plan **4. A**nswer an invitation to a house-warming party with a letter **5.** Express your likes and dislikes about houses **6.** Speak about various types of houses **7.** Write a text about an apartment and the furniture Speech intentions **.** Understand ads about apartments **2.** Describe an appartment **3.** Draw and explain an appartment plan **4. A**nswer an invitation to a house-warming party with a letter **5.** Express your likes and dislikes about houses **6.** Speak about various types of houses	4
	Module 2: Vocabulary **1.** Apartment	3

	2. Rooms and space **3.** Furniture and white goods **4.** Colours **T**ypes of houses Grammar **1.** Adjectives with the verb to be (sein) + very (sehr)/ too (zu) **2.** Changing prepositions with dative Pronounciation 1. s and sch Write about your house/ apartment	
5	**Module 1:** Introduction to the perfect tense: how to say what has happened in the past! Brief introduction to the forms of the past participles and the helping verbs.	4
	Module 2: Write what one did on the previous day.	4

Outcomes:
CIA 1A: Listening comprehension on time announcements, CIA 1B: Student makes a recording about his/her family and draws a family tree CIA 2A: Internal test CIA 2B: Internal test CIA 3: Students make out an invitation to their birthday party CIA 4: The students will research on a topic of housing in the city: new complexes that are coming up in the city or modern vs traditional houses in Nashik or something similar
Text Books
1. Netzwerk A1 2. Tangram A1 3. Studio D A1 4. Moment Mal A1 5. Themen All books are published by Goyalsaab Delhi **a.** We will be using Netzwerk A1 as the base for teaching.
Reference Book
www.youtube.com german150 https://www.youtube.com/channel/UC5ZnpdkQIit8TWhGVDiDnQQ https://www.youtube.com/watch?v=PMj9kUPrnBk&t=46sMein Wegnach Deutschland https://www.youtube.com/watch?v=X-J1t8q0wxMTypisch! Dw.com/nico www.vitaminde.de Deutschtrainer A1 – Learning App from Google Store

SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

B. Tech CSE (with specialization in Internet of Things)
Semester – VI

Sr. No.	Core	Course Code	Course Name	Teaching Scheme (Hrs./Week)				Examination Scheme				Total Marks
				L	T	P	C	Formative Assessment CIA		Summative Assessment ESE		
								Course	Lab	Course	Lab	
1	PC	YCI601	Embedded Technology for IoT	3	--	--	3	50	--	50	--	100
2	PC	YCI602	Design and Analysis of Algorithm	3	--	--	3	50	--	50	--	100
3	PC	YCI603	Cloud Architecture and Deployment Models	3	1	--	4	50	--	50	--	100
4	PC	YCI604	WNS and IoT Standards	3	--	--	3	50	--	50	--	100
5	PC	YCIO__	Open Elective I	3	--	--	3	50	--	50	--	100
6	PC	YCI611	Dynamic Paradigm in Internet of Things 4	--	--	1	1	--	50	--	--	50
7	PC	YCI612	Embedded Technology for IOT Lab	--	--	4	2	--	25	--	25	50
8	PC	YCI613	Cloud Architecture and Deployment Models Lab	--	--	4	2	--	25	--	25	50
9	UC	YCI614	Seminars And Technical Communications	--	--	2	1	--	50	--		50
TOTAL				**15**	**01**	**11**	**22**	**250**	**150**	**250**	**50**	**700**

		CIA	Weightage	Description
CIA: Continuous Internal Assessment	#: Internship for 15 days.	CIA 1	10%	Home Assignment
L: Theory Lecture	*: Oral Examination	CIA 2	20%	Mid-Term Exam (MTE)
T: Tutorial	**UC**: University Core	CIA 3	10%	Seminar Presentation
P: Practical	**PC**: Programme Core	CIA 4	10%	Research Based Activity
TH: Theory Exam.	**PE**: Programme Elective	**TOTAL**	**50%**	

Open Elective I:

1. Computer Network**(YCIO01)**
2. E-Commerce**(YCIO02)**

Note:

$: Probable MOOC and SWAYAM Courses (Software Engineering)

Document Reference	Revision No. / Date	Prepared By	Approved By
SUN/SOCSE/BTECH/IoT/2019	R1 / 20 August 2019		

SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – VI**

Course: Embedded Technology for IOT **Course Code: YCI601**

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	Theory	Lab	
3	0	0	3	10	20	10	10	--	50	--	100
Max. Time, End Semester Exam (Theory) -3Hrs.									End Semester Exam (Lab) – 00 Hrs.		

Prerequisites:
Wireless Sensor Network

Objectives:	
The course will enables students to:-	
1	Understand basics of embedded system
2	Know various embedded processor and memory interface
3	Understand various embedded software and tools
4	Learn different testing tools for embedded systems

Unit No	Details	Hours
1	**Module 1:Introduction** Introduction to Real Time Embedded Systems, Embedded Systems Components	4
	Module 2:Embedded Processors and Memory Digital Signal Processors, General Purpose Processors, Embedded Processors, Memory-Interfacing	4
2	**Module 1:Embedded Systems I/O** Interfacing bus, Protocols, ISA bus etc., Timers, Interrupts, DMA, USB and IrDA, AD and DA Converters, Analog Interfacing.	4
	Module 2:Design of Embedded Processors Field Programmable Gate Arrays and Applications, Introduction to Hardware Description Languages.	4
3	**Module 1:Embedded Communications** Parallel Data Communication, Serial Data Communication, Network Communication, WirelessCommunication.	4
	Module 2:Embedded System Software Introduction to Real-Time Systems, Real-Time Task Scheduling, Concepts in Real-Time OperatingSystems, Commercial Real-Time Operating Systems.	4
4	**Module 1:Software Engineering Issues** Introduction to Software Engineering, Requirements Analysis and Specification	3
	Module 2: Modelling TimingConstraints, Software Design.	3
5	**Module 1:Testing of Embedded System** Testing Embedded Systems, Design for Testability, Built-In-Self-Test (BIST) for	3

	Embedded Systems	
	Module 2: Boundary Scan Methods and Standards, On-line Testing of Embedded Systems.	3

Outcomes:	
At the end students will be able to-	
1	Describe basics of embedded system
2	Explain embedded processor and memory interface
3	Use embedded software and tools
4	Apply different testing tools for embedded systems
5	Analyze software issues
Text Books	
Embedded Technology for IOT (IBM ICE Publication)	
Reference Book	
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SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – VI**

Course: Design and Analysis of Algorithms **Course Code: YCI602**

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	Theory	Lab	
3	-	-	3	10	20	10	10	--	50	--	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.									End Semester Exam (Lab) – 00 Hrs.		

Prerequisites:
Data Structures, Discrete Mathematics and Logic

Objectives:	
The course will enables students to:-	
1	Analyze the asymptotic performance of algorithms.
2	Write rigorous correctness proofs for algorithms.
3	Demonstrate a familiarity with major algorithms and data structures.
4	Apply important algorithmic design paradigms and methods of analysis.
5	Synthesize efficient algorithms in common engineering design situations.

Unit No	Details	Hours
1	**Module 1:** Algorithm, Psuedo code for expressing algorithms, performance Analysis-Space complexity, Time complexity,	4
	Module 2: Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, probabilistic analysis, Amortized analysis.	4
2	**Module 1:** Divide and conquer: General method, applications-Binary search	4
	Module 2: Divide and conquer: Quick sort, Merge sort	3
3	**Module 1** : Greedy method**:** General method, applications-Job sequencing with deadlines, knapsack problem.	4
	Module 2: Greedy method**:**Spanning trees, Minimum cost spanning trees, Single source shortest path problem.	4
4	**Module 1:** Dynamic Programming: General Method, Applications-Matrix chain multiplication, Optimal binary search tree,	4
	Module 2: Dynamic Programming: 0/1 Knapsack problem, All pairs shortest path problem, Travelling salesman problem, Reliability design.	3
5	**Module 1:** Backtracking: General method, Applications-N Queen problem, Sum of subsets problem, Graph coloring, Hamiltonian cycles.	4
	Module 2: Branch and Bound: General method, Applications- Travelling sales person problem, LC Branch and bound solution, FIFO Branch and Bound Solution.	4

Outcomes:

At the end of the course, student will be able to–	
1	Analyze worst-case running times of algorithms using asymptotic analysis.
2	Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it.
3	Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it.
4	Describe the greedy paradigm and explain when an algorithmic design situation calls for it.

Text Books

1. Fundamentals of Computer Algorithms, Ellis Horowitz, SatrajSahni and Rajasekharam, Universities Press.
2. Design and Analysis of Algorithms , S Sridhar, Oxford
3. Design and Analysis of Algorithms, ParagHimanshu Dave, HimansuBAlachandra Dave, 2ed,Pearson Education.

Reference Book

1. Design and Analysis of algorithms, Aho, Ullman and Hopcroft,Pearson education.
2. Introduction to the Design and Analysis of Algorithms, AnanyLevitin, PEA
3. Introduction to Algorithms, second edition, T.H.Cormen, C.E.Leiserson, R.L.Rivest and C.Stein,PHI Pvt. Ltd.
4. Algorithm Design, Foundation, Analysis and internet Examples, Michel T Goodrich, Roberto Tamassia, Wiley

SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – VI**

Course: Cloud Architecture and Deployment Models **Course Code: YCI603**

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	Theory	Lab	
3	1	0	4	10	20	10	10	--	50	--	100
Max. Time, End Semester Exam (Theory) -3Hrs.									End Semester Exam (Lab) – 00 Hrs.		

Prerequisites:
Embedded System, WSN

Objectives:	
The course will enables students to:-	
1	Know various Cloud platforms and models
2	Understand Virtualization in cloud environment
3	Learn different cloud services
4	Understand cloud platform deployment for live applications

Unit No	Details	Hours
1	**Module 1:Cloud Computing Platform Overview**: Overview of Cloud computing, Cloud Definition, Cloud History, Internet Technologies, SOAconcepts, what constitutes a basic SOA architecture? Prepare to implement an SOA, Entrypoints to SOA, Mashups & Internet of Things (IOT), Distributed Computing, Grid computing,Cluster,	4
	Module 2: Virtual Machine Monitor (VMM) platforms, Benefits of server virtualization,Implications of virtual appliances, System Management, Anatomy of a cloud, Cloud ComputingSolution Components, what is different about cloud computing? Benefits of Cloud, CloudTransformation Roadmap. Cloud Delivery models and their advantages, Cloud ComputingArchitecture, Cloud Computing Challenges, Cloud deployment models.	4
2	**Module 1:IaaS, PaaS and SaaS:** Introduction to Infrastructure as a Service delivery model, characteristics of IaaS,Architecture, examples of IaaS, Applicability of IaaS in the industry , Comparing ISPs andIaaS, Motivations for renting the infrastructure; IaaS Case studies; IaaS enabling Technology;Trusted cloud. Introduction to Platform as a Service delivery model, characteristics of PaaS,patterns, architecture and examples of PaaS, Applicability of PaaS in the industry ;	4
	Module 2: Integrated Lifecycle Platform; Anchored Lifecycle platform; Enabling Technologies as aPlatform; PaaS – best option or not. Introduction to Software as a Service delivery model,characteristics of SaaS, SaaS Origin; Evolvement of SaaS	4

	– Salseforce.com's approach; SaaSEconomics and Ecosystem; Types of SaaS Platforms; Architecture, SaaS – Providers;Collaboration as a Service; Enabling and Management tools as a Service; Applicability of SaaS inthe industry.	
3	**Module 1:Cloud Computing Reference Architecture (CCRA):** Introduction to Cloud computing reference architecture (CCRA), benefits of CCRA,Architecture overview – The conceptual Reference Model; Cloud Consumer; Cloudprovider; Cloud Auditor; Cloud carrier; Scope of control between Provider and Consumer;	4
	Module 2: CCRA : Architectural Components – Service deployment , Service Orchestration, CloudService Management, Security; Cloud Taxonomy; IBM's Cloud Computing ReferenceArchitecture(CCRA 2.0) – Introduction, roles, Architectural elements; CCRA evolution;Examples of Cloud Services; versions and application of CCRA for developing clouds.	4
4	**Module 1:Private, Public & Hybrid Cloud Deployment Models:** Private Cloud, Impact of Cloud Computing, Simple virtual machine deployment scenario, CloudService Lifecycle, Cloud benefits, Limitations of Private Cloud, Service management, Journeyinto Private Cloud, many clients start with a private cloud, Virtualization, Automation,Standardization – Benefits, Resource pools, Automated service management, Email – Approvalrequest sample, IBM SmartCloud spans IaaS, PaaS and SaaS, IBM SmartCloud entry – Keycapabilities, VMware vCloud.	4
	Module 2:Public cloud: Traditional IT model, Public cloud deployment model, Private V/S Publiccloud, SLA – Service Level Agreements, Security and Privacy, Proven track record, Amazon IaaS,Explore Google cloud applications: Google Calendar, Explore Google cloud applications: GoogleDrive. What is Hybrid cloud? Managing Hybrid workloads, Journey into Hybrid cloud, Hybrid Cloud –Summary.	4
5	**Module 1:** OpenStack implementationWhat is OpenStack, Important features of OpenStack, Architectural overview,	3
	Module 2: DifferentComponents of Openstack.	3

Outcomes:	
At the end students will be able to-	
1	Describe various Cloud platforms and models
2	Implement Virtualization in cloud environment
3	Explain different cloud services
4	Apply cloud platform deployment for live applications
Text Books	
Cloud Computing Architecture & Deployment Models (IBM ICE Publication)	
Reference Book	
1. Cloud Computing For Dummies (November, 2009), Judith Hurwitz, Robin Bloor, Marcia Kaufman, Dr. Fern Halper 2. IBM Cloud Computing http://www.ibm.com/cloud-computing/us/en/ 3. 4. Wikipedia page on Cloud Computing http://en.wikipedia.org/wiki/Cloud_computing	

SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – V**

Course: Wireless Sensor Networks (WSN) & IoT Standards **Course Code: YCI502**

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	Theory	Lab	
3	-	-	3	10	20	10	10	-	50	-	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.									End Semester Exam (Lab) – 00 Hrs.		

Prerequisites:
Introduction to IoT, Sensor Technology

Objectives:	
The course will enables students to:-	
1	Understand the basics of WSN
2	Knows the various types of Sensors
3	Understands different types of wireless protocols

Unit No	Details	Hours
1	**Module 1: Characteristics of WSN** Hardware Components; Energy Consumption of Sensor Nodes	4
	Module 2: Operating Systems and execution environments; Network Architecture	4
2	**Module 1: Physical Layer** Frequency Allocation	4
	Module 2: Packet transmission and Synchronization	3
3	**Module 1: MAC and Link Layer Protocols** IEEE 802.15.4 MAC Protocol; Contention based protocols	4
	Module 2: Schedule based protocols; Error Control; Link Management	4
4	**Module 1:Routing Protocols and Data / Content centric Networking** Energy-efficient unicast; Broadcast and multicast	4
	Module 2: Geographic Routing; Data-Centric routing;Data Aggregation	3
5	**Module 1:Applications of WSN:** IPv6,CoAP; Building Automation; Internet Of Things	4
	Module 2: Smart Agriculture; Perimeter monitoring; Object Tracking **IOT Standards**	4

Outcomes:	
On completion of the course, student will be able to–	
1	Understand the basics of WSN
2	Understands the various types of Sensors
3	Understands different types of wireless protocols
Text Books	

WSN and IoT Standards by IBM ICE Publications
Reference Book
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SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – VI**

Course: Computer Networks **Course Code: YCIO01**

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	Theory	Lab	
3	-	-	3	10	20	10	10	--	50	--	100
Max. Time, End Semester Exam (Theory) - 03 Hrs.									End Semester Exam (Lab) – 00 Hrs.		

Prerequisites:
Basics of Computer Networks and Data Communications

Objectives:	
The course will enables students to:-	
1	To introduce the fundamental various types of computer networks.
2	To demonstrate the TCP/IP and OSI models with merits and demerits.
3	To explore the various layers of OSI Model.
4	To introduce UDP and TCP Models.

Unit No	Details	Hours
1	**Module 1:** Components – Direction of Data flow – Networks – Components and Categories – Types of Connections – Topologies –Protocols and Standards – ISO / OSI model, Example Networks such as ATM,	4
	Module 2: Frame Relay, ISDN Physical layer: Transmission modes, Multiplexing, Transmission Media, Switching, Circuit Switched Networks, Datagram Networks, Virtual Circuit Networks.	4
2	**Module 1:** Introduction, Framing, and Error – Detection and Correction – Parity – LRC–CRC Hamming code, Flow and Error Control, Noiseless Channels, Noisy Channels, HDLC.	4
	Module 2: Point to Point Protocols. 111 Medium Access sub layer: ALOHA, CSMA/CD, LAN –Ethernet IEEE 802.3, IEEE 802.5 – IEEE 802.11, Random access, Controlled access, Channelization.	3
3	**Module 1**: Logical Addressing, Internetworking, Tunneling, Address mapping, ICMP, IGMP.	4
	Module 2: Forwarding, Uni-Cast Routing Protocols, Multicast Routing Protocols.	4
4	**Module 1:** Process to Process Delivery, UDP and TCP protocols, Data Traffic, Congestion, Congestion Control.	4
	Module 2: QoS, Integrated Services, Differentiated Services, QoS in Switched Networks.	3
5	**Module 1:** Domain name space, DNS in internet, electronic mail.	4
	Module 2: , SMTP, FTP, WWW, HTTP, SNMP.	4

Outcomes:	
On completion of the course, student will be able to–	
1	To master the concepts of protocols, network interfaces, and design/performanceissues in local area networks and wide area networks.
2	To be familiar with wireless networking concepts.
3	To be familiar with contemporary issues in networking technologies.
4	To be familiar with network tools and network programming.

Text Books

1. Data Communications and Networking, Behrouz A. Forouzan , Fourth Edition TMH, 2006.
2. Computer Networks, Andrew S Tanenbaum, 4th Edition. Pearson Education, PHI.

Reference Book

1. Data communications and Computer Networks, P.C .Gupta, PHI.
2. An Engineering Approach to Computer Networks, S. Keshav, 2nd Edition, Pearson Education.
3. Understanding communications and Networks, 3rd Edition, W.A. Shay, Cengage Learning.
4. Computer Networking: A Top-Down Approach Featuring the Internet. James F. Kurose & Keith W. Ross, 3 rd Edition, Pearson Education.
5. Data and Computer Communication, William Stallings, Sixth Edition, Pearson Education, 2000.

SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – VI**

Course: E-Commerce **Course Code:YCIO02**

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	Theory	Lab	
3	--	--	3	10	20	10	10	--	50	--	100
Max. Time, End Semester Exam (Theory) -3Hrs.									End Semester Exam (Lab) : 00 Hrs.		

Prerequisites:
Professional Ethics

Objectives:	
Students are able to:-	
1	Understand the e business concepts.
2	Understand e-business models and infrastructure.
3	Understand hoe e-business concepts are applied to different fields like education, banking tourism and so on.
4	Inspire students with various online business ideas.

Unit No	Details	Hours
1	**Module 1:**Introduction to E-business.	3
	Module 2: Making Functional Areas E-Business Enabled : Value chain and supply chain, inter and intra organizational business processes, ERP.	4
2	**Module 1**Making Functional Areas E-Business Enabled : E-Procurement	4
	Module 2 Making Functional Areas E-Business Enabled : E-marketing, E-Selling, E-Supply Chain Management	4
3	**Module 1**: Technologies for E-Business: Internet and Web based system	4
	Module 2 Technologies for E-Business: Security and payment systems.	4
4	**Module 1:**Technologies for E-Business: Supply chain integration technologies (EDI, RFID, Sensors, IoT, GPS, GIS).	4
	Module 2: Technologies for E-Business: Supply chain integration technologies (Web services and cloud)	3
5	**Module 1**Decision Support in E-Business: Web analytics, Decision Support in E-Business: Customer behavior modeling	4
	Module 2: Decision Support in E-Business: Auctions, Decision Support in E-Business: Recommender systems	4

Outcomes:	
On completion of the course, student will be able to–	
1	Able to distinguish between e-commerce and e-business.
2	Understand e-marketplaces.
3	Students are able to state various requirements for starting an online business.

4	Students will be able to work in groups in order to design a new online business idea.
5	Students will be able to analyze and present successful e-business stories.
Text Books	
Electronic Commerce: A managerial perspective, Turban, Prentice Hall Publ. 2008	
Reference Book	
Electronic Business and Electronic Commerce Management, 2nd edition, Dave Chaffey, Prentice Hall, 2006.	

SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – VI**

Course: Dynamic Paradigm in IoT 4 **Course Code: YCI611**

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	Theory	Lab	
0	0	2	1	--	--	--	--	25	0		25
Max. Time, End Semester Exam (Theory) -00 Hrs.									End Semester Exam (Lab) – 03 Hrs.		

Prerequisites:
Basics of business analytics

Objectives:	
The course will enables students to:-	
1	To learn recent trends.
2	To learn recent software tools and technologies.

Guidelines for Assessment

Continuous assessment of laboratory work is done based on overall performance and lab assignments performance of student. Each lab assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each lab assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.

Guidelines for Laboratory Conduction

The instructor is expected to frame the assignments by understanding the prerequisites, technological aspects, utility and recent trends related to the topic. The assignment framing policy need to address the average students and inclusive of an element to attract and promote the intelligent students. The instructor may set multiple sets of assignments and distribute among batches of students. It is appreciated if the assignments are based on real world problems/applications. Encourage students for appropriate use of Hungarian notation, Indentation and comments. Use of open source software is encouraged.

In addition to these, instructor may assign one real life application in the form of a mini-project based on the concepts learned. Instructor may also set one assignment or mini-project that is suitable to respective branch beyond the scope of syllabus.

Operating System recommended : 64-bit Open source Linux or its derivative
Programming tools recommended: Open Source C Programming tool like GCC

Suggested List of Laboratory Assignments

Seminars and Workshops on emerging trends in IoT will be conducted by IBM trainer.

SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – VI**

Course: Embedded Technology for IOT Lab **Course Code:YCI6012**

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	Theory	Lab	
0	0	4	2	--	--	--	--	50	0	0	50
Max. Time, End Semester Exam (Theory) -00 Hrs.									End Semester Exam (Lab) – 03 Hrs.		

Prerequisites:
Programing with Python

Objectives:	
The course will enables students to:-	
1	Understands programing fundamentals
2	Know basics of python for Embedded systems
3	Understand use of python library for complex Embedded systemsproblem solving

Guidelines for Assessment

Continuous assessment of laboratory work is done based on overall performance and lab assignments performance of student. Each lab assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each lab assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.

Guidelines for Laboratory Conduction

The instructor is expected to frame the assignments by understanding the prerequisites, technological aspects, utility and recent trends related to the topic. The assignment framing policy need to address the average students and inclusive of an element to attract and promote the intelligent students. The instructor may set multiple sets of assignments and distribute among batches of students. It is appreciated if the assignments are based on real world problems/applications. Encourage students for appropriate use of Hungarian notation, Indentation and comments. Use of open source software is encouraged.

In addition to these, instructor may assign one real life application in the form of a mini-project based on the concepts learned. Instructor may also set one assignment or mini-project that is suitable to respective branch beyond the scope of syllabus.

Operating System recommended : 64-bit Open source Linux or its derivative
Programming tools recommended: Open Source C Programming tool like GCC

Suggested List of Laboratory Assignments

Assignment List will be provided by IBM ICE trainer

SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – VI**

Course: Cloud Computing Architecture and Deployment Models Lab **Course Code:YCI613**

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	Theory	Lab	
0	0	4	2	--	--	--	--	50	0	0	50
Max. Time, End Semester Exam (Theory) -00 Hrs.									End Semester Exam (Lab) – 03 Hrs.		

Prerequisites:
Programing with Python

Objectives:	
The course will enables students to:-	
1	Understands programing fundamentals for cloud maintenance
2	Know basics of cloud implementation
3	Understand use of library for complex problem solving of cloud implementation

Guidelines for Assessment

Continuous assessment of laboratory work is done based on overall performance and lab assignments performance of student. Each lab assignment assessment will assign grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each lab assignment assessment include- timely completion, performance, innovation, efficient codes, punctuality and neatness.

Guidelines for Laboratory Conduction

The instructor is expected to frame the assignments by understanding the prerequisites, technological aspects, utility and recent trends related to the topic. The assignment framing policy need to address the average students and inclusive of an element to attract and promote the intelligent students. The instructor may set multiple sets of assignments and distribute among batches of students. It is appreciated if the assignments are based on real world problems/applications. Encourage students for appropriate use of Hungarian notation, Indentation and comments. Use of open source software is encouraged.

In addition to these, instructor may assign one real life application in the form of a mini-project based on the concepts learned. Instructor may also set one assignment or mini-project that is suitable to respective branch beyond the scope of syllabus.

Operating System recommended : 64-bit Open source Linux or its derivative
Programming tools recommended: Open Source C Programming tool like GCC

Suggested List of Laboratory Assignments

Assignment List will be provided by IBM ICE trainer

SANDIP UNIVERSITY

School of Computing Science and Engineering

Department of Computer Science and Engineering

Year: Third Year **Semester – VI**

Course: Seminars And Technical Communications **Course Code: YCI614**

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	Theory	Lab	
--	--	2	1	--	--	--	--	25	--	25	50
Max. Time, End Semester Exam (Theory) -03 Hrs.									End Semester Exam (Lab) – 00 Hrs.		

Objectives:	
Students are able to:-	
1	To expose students to the 'real' working environment and get acquainted with the organization structure, business operations and administrative functions.
2	To set the stage for future recruitment by potential employers.

Unit No	Details	Hours
1	**Course (catalog) description:** As a part of the B. Tech Curriculum, SEMINAR is a Practical course, in which the students of CSE are trained for presentation skills. **Course Guidelines:** **Grading:** **The Course is graded based on:** **Presentation : 50%** **Student's reports : 20%** **PPT presentation : 25%** **Attendance : 05%** **Note**: • Presentation will take place in the weekly class. The presentation is evaluation by your class in charge. • Report must be submitted during presentation. The report evaluation is done by your class in charge. • A Viva voce comprising a comprehensive questions based on your presentation. **Etiquette :** • Dress properly • Behave well • Portray good image as a university student • Be punctual • Observe work ethics • Concern for safety • Be professional	

Outcomes:	
On completion of the course, student will be able to–	
1	An ability to work in actual working environment.
2	An ability to utilize technical resources.
3	An ability to write technical documents and give oral presentations related to the work completed.