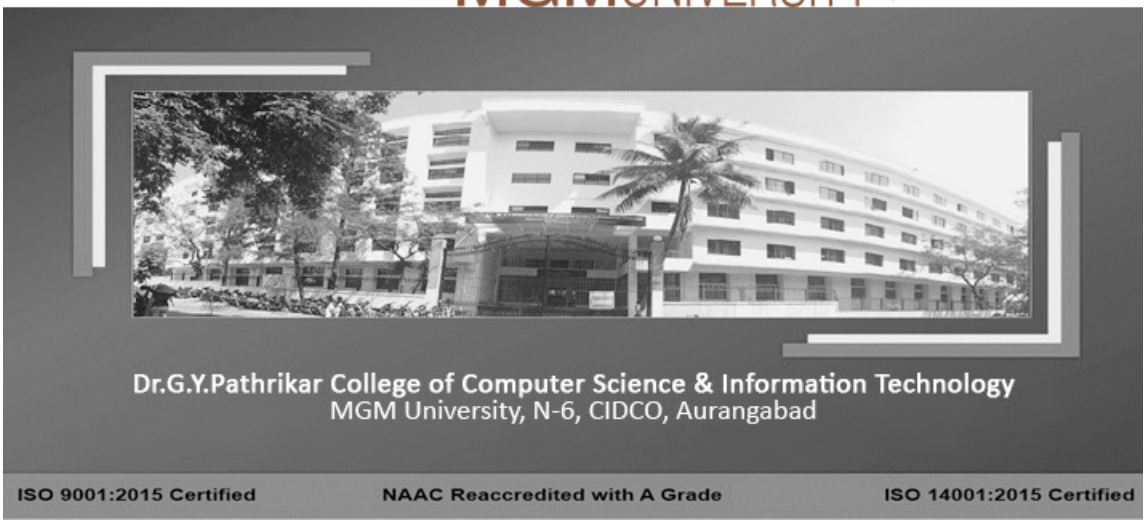
॥ अप्पो दीपो भव ॥
महात्मा गांधी मिशन विश्वविद्यालय
MGMUNIVERSITY



PROGRAM CURRICULUM

B.Sc. (Information Technology)
[With Effect from: June-2020]

[1]. Introduction:

The B.Sc. (Information Technology) is 3 year undergraduate degree program under the faculty of Basic Science and Applied Science, MGM University with a specialization in the area of Information Technology and its aspects. B.Sc. (Information Technology) follows semester pattern with choice based credit system. In this technological era, the best career option for students in present and immediate future is to become an Information Technology (IT) professional.

This degree intent students to work in the Information Technology industry and provide them an opportunity to become an entrepreneur in IT Sector. This degree primarily focuses on courses such as databases, programming skill, web / mobile technologies, cloud computing, internet of thing, machine learning, networking and so on.

[2]. Program Objective:

The Bachelor of Science in Information Technology [B.Sc. (I.T.)] program is designed with the POs as follows:

After the program completion the students will be able to:

a) Gain the **Knowledge** about the Basic Concept, terminologies related to current trends in Information Technology.
b) **Understand** and **Apply** his / her programming and technical skill related to database, data structure and computational mathematics.
c) **Analyze** the possible solutions for complex problems and design system components or processes using the concept of software project management, Data Science and Artificial Intelligence.
d) **Evaluate** the basic understanding of Object Oriented Technologies, Network Securities and Data Structures as an aspiring developer.
e) **Create,** select, and apply appropriate techniques, resources related to modern Information Technology tools, web / mobile technologies, machine learning and Cyber world.

[3]. Eligibility Criteria:

A Candidate shall be admitted to First year of the B.Sc. (Information Technology) degree program only if he/she satisfies the following condition:

He / She must have passed the higher secondary (multipurpose) examination conducted by H.S.C. board Government of Maharashtra with science / technical subjects **OR** an Examination of any statutory University and Board recognized as equivalent thereto.

OR

He / She must have passed examination prescribed at the end of second year of the junior college conducted by the H.S.C. board, Government of Maharashtra with English, Second language, Physics, Chemistry, Mathematics and or Biology or one of the technical subjects prescribed at the said examination as the optional or elective subjects or an examination recognized as equivalent thereto.

OR

Candidate having offered prescribed vocational course (MCVC) with Computer techniques/I.T./Electronics.

OR

Three years Diploma Course in engineering conducted by the board of technical Education, Maharashtra State.

[4]. Curriculum Planning Using Bloom's Taxonomy Approach:

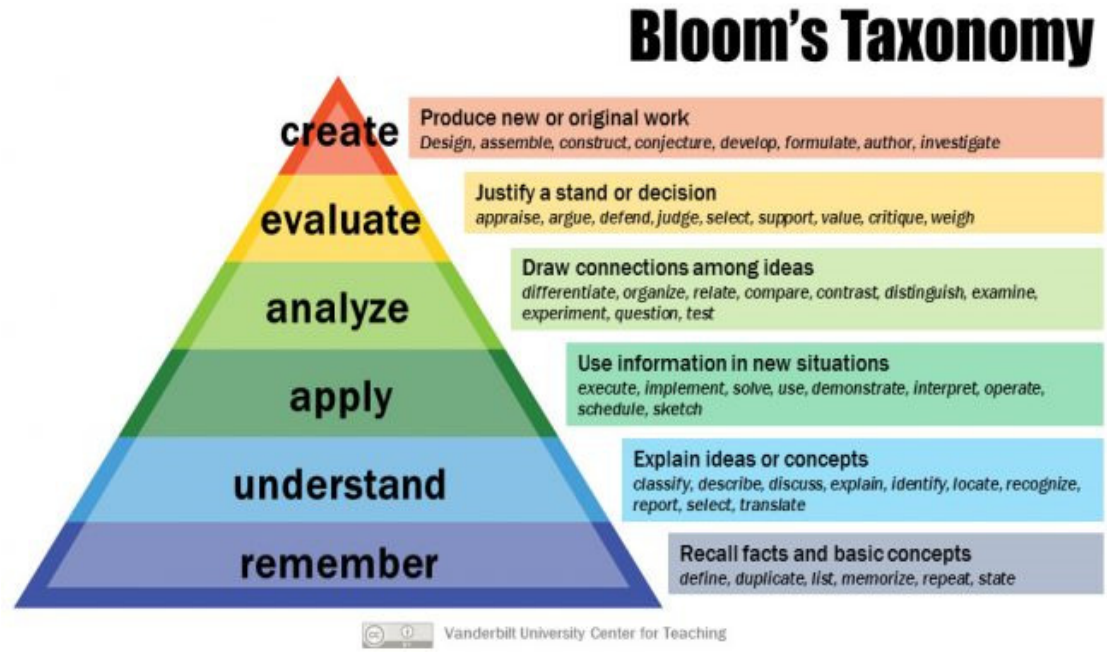
- **Core Course (CC):** A Course, which is compulsory to be studied by a candidate as a core requirement.

- **Discipline Specific Elective Course (DSE):** It is a course which can be chosen from a pool of courses and it may be specific or specialized or advanced or supportive to the discipline. Elective Courses as offered by the main discipline / subject of study is said to be DSE Course.

- **Ability Enhancement Course (AEC) :** The Ability Enhancement Course are based upon the content that leads to knowledge enhancement specific to
  - Environmental Science
  - English / Soft Skill Development

- Humanities-Ethical, Moral & Social. Eg: Gandhian's Thoughts, Yoga etc.

➢ **Open Elective Course (OEC):** The Elective Course which can be selected by the students within the campus as per his/her choice.



The Degree of Bachelor of Science (Information Technology) shall be conferred on candidate who has pursued a regular course of study consisting of six semesters in the relevant course as prescribed and has appeared at the end examination and passed under the credit based system in all the examination prescribed for the Degree program in the faculty of Basic & Applied Science.

[5]. PATTERN OF QUESTION PAPERS

- **Internal Class Test**
  - Two Class tests each of 20 Marks is to be conducted after completion of 15-20 Lecturers and the best of it will be taken into the consideration for final evaluation.
- **Theory**
  - Each theory paper will carry Maximum 60 marks; duration of examination of theory paper will be 2 hours.

- **Practical**
  - Each Practical paper will carry Maximum 50 marks, duration of examination of each practical paper will be 2 hours.
  - Distribution of marks for each practical paper will be as follows.
    - Term Work (TW) 20 marks.
    - Practical Exam (PR) 30 marks.

- **PROJECT / Industrial Training:-**
  - Students of semester VI will have to perform Project at the site of Industry / User-End. Distribution of project marks will as follows.
    - Submission of Internship-Joining Letter : 50
    - Certificate for Attendance of 300 working hours : 150
    - Review 1 Report : 50
    - Review 2 Report : 50
    - Project work (certified): 100 marks.
    - Project work Presentation: 50marks.
    - Viva/ Oral: 50 marks.

❖ **Semester End Examination Paper Format:**

Code No. . . . . **Set -I**

Faculty of Basic and Applied Science

B.Sc. (Information Technology) – First Year – (__ Semester) Theory Examination

March/April – 2021

Subject: Information Technology **Full Title of the Paper:**

Time: 03 Hour **Program:** B.Sc. (I.T.) **Max.Marks:** 60

Q.1	Multiple Choice / Fill in the blanks / Match the pair	1*12=12
1.		
2.		
3.		
…		
11.		
12.		
Q.2	Short Answer [Understanding Level] (Any Six)	2*6=12
a)		
b)		
c)		
d)		
e)		
f)		
g)		
h)		
Q.3	Middle Length Answers [Apply & Analyze Level] (Any Four)	4*4=16
a)		
b)		
c)		
d)		
e)		
f)		
Q.4	Solve Problem [Application Level] (Any two)	5*2=10
a)		
b)		
c)		
Q.5	Long Answers (Any Two)	5*2=10
a)		
b)		
c)		

[6]. Assessment / Evaluation Scheme:

The Final total assessment of the candidate shall be made in terms of an internal assessment, practical assessment (wherever applicable) and a semester end assessment for each course, except in case of semester VI (Project / Seminar / Internship).

a. The internal, practical and external assessment will constitute separate heads of passing and they will be shown separately in the transcripts.

b. For each course, the ratio of marks of internal assessment in relation to the external assessment shall be 40:60

c. The continuous assessment of the 20 marks allotted will be based on either class-test / tutorial work / online-exam. Continuous assessment will be comprising of attendance, journal work, discipline, attitude, etc.

d. The Mid-Semester Examination of the 20 marks will be based on the syllabus covered till date.

e. The End-Semester Examination shall be based on the Theory examination and practical to be held at the end of each semester for each course.

f. The Training Report / Project Report / Viva-voce shall constitute separate heads of passing individually.

g. The marks awarded by an examiner in the internal assessment shall be communicated to the candidates.

h. Reassessment of CA / MSE :

In case of those students who have secured less than passing percentage of marks in CA / MSE, the concerned institute shall administer a separate test of respective improvement, and if the result of the internal test as above results in lower marks than the original, the original figure of the marks shall prevail. In short, the rule is that the higher of the two figures of the marks shall be taken into consideration.

Grade Awards:

i) A ten point rating scale shall be used for the evaluation of the performance of the student to provide letter grade for each course and overall grade for the Master's Program. Grade points are based on the total number of marks obtained by him/her in all the heads of examination of the course. These grade points and their equivalent range of marks are shown separately in Table-I.

Sr.No	Equivalent percentage	Grade points	Grade	Grade description
1	90.00-100	9.00-10	O	Outstanding
2	80.00-89.99	8.00-8.99	A++	Excellent
3	70.00-79.99	7.00-7.99	A+	Exceptional
4	60.00-69.99	6.00-6.99	A	Very good
5	55.00-59.99	5.50-5.99	B+	Good
6	50.00-54.99	5.00-5.49	B	Fair
7	45.00-49.99	4.50-4.99	C+	Average
8	40.01-44.99	4.01-4.49	C	Below average
9	40	4.00	D	Pass
10	< 40	0.00	F	Fail

PROGRAM : B.Sc. (Information Technology) : First Year																		
Semester I																		
Course code*	**Course Title**	**Type**	**Teaching Scheme**			**Evaluation Scheme**						**Minimum Passing**						**Credit**
						Internal			**External**		Total	**Internal**			**External**		Total	
(Mandatory)			L	T	P	CA	MSE	TW	ESE	PR		CA	MSE	TW	ESE	PR		
BITT-101	Advances in Information Technology	CC	3	1	-	10	20	10	60	-	100	4	8	4	24	-	40	4
BITT-102	Programming logic & Design	CC	3	-	-	20	20	-	60	-	100	8	8	-	24	-	40	3
BITT-103	Computing Hardware	DSE	3	-	-	20	20	-	60	-	100	8	8	-	24	-	40	3
BITT-104	Basic Mathematics	DSE	3	-	-	20	20	-	60	-	100	8	8	-	24	-	40	3
BITT-105	Communicative English - I	AECC	2	-	-	20	20	-	60	-	100	8	8	-	24	-	40	2
BITP-101	Practical Based on Open-Office	DSE	-	-	2	-	-	20	-	30	50	-	-	8	-	12	20	1
BITP-102	Practical Based on BITT-102	CC	-	-	4	-	-	20	-	30	50	-	-	8	-	12	20	2
BITP-103	Practical Based on BITT-103	DSE	-	-	4	-	-	20	-	30	50	-	-	8	-	12	20	2
BITP-104	Practical Based on BITT-104	DSE	-	-	4	-	-	20	-	30	50	-	-	8	-	12	20	2
	Total		14	1	14	90	100	90	300	120	700							22
Semester II																		
Course code*	**Course Title**	**Type**	**Teaching Scheme**			**Evaluation Scheme**						**Minimum Passing**						**Credit**
						Internal			**External**		Total	**Internal**			**External**		Total	
(Mandatory)			L	T	P	CA	MSE	TW	ESE	PR		CA	MSE	TW	ESE	PR		
BITT-201	Database technologies and Applications	CC	3	-	-	20	20	-	60	-	100	8	8	-	24	-	40	3
BITT-202	Algorithm Design & Data Structures	CC	3	-	-	20	20	-	60	-	100	8	8	-	24	-	40	3
BITT-203	Introduction to Statistic for Data Analysis	DSE	3	-	-	20	20	-	60	-	100	8	8	-	24	-	40	3
BITT-204	Open Source: Operating System	DSE	3	1	-	10	20	10	60	-	100	4	8	4	24	-	40	4
BITT-205	Communicative English – II	AECC	2	-	-	20	20	-	60	-	100	8	8	-	24	-	40	2
BITP-201	Practical Based on BITT-201	CC	-	-	4	-	-	20	-	30	50	-	-	8	-	12	20	2
BITP-202	Practical Based on BITT-202	CC	-	-	4	-	-	20	-	30	50	-	-	8	-	12	20	2
BITP-203	Practical Based on BITT-203	DSE	-	-	2	-	-	20	-	30	50	-	-	8	-	12	20	1
OEC-C1	Open Elective Course : C1	OEC	-	-	4	-	-	20	-	30	50	-	-	8	-	12	20	2
	Total		14	1	14	90	100	90	300	120	700							22
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.																		

PROGRAM : B.Sc. (Information Technology) : Second Year																		
Semester III																		
Course code*	Course Title	Type	Teaching Scheme			Evaluation Scheme						Minimum Passing						Credit
						Internal			External		Total	Internal			External		Total	
(Mandatory)			L	T	P	CA	MSE	TW	ESE	PR		CA	MSE	TW	ESE	PR		
BITT-301	Software Project Management	CC	3	1	-	10	20	10	60	-	100	4	8	4	24	-	40	4
BITT-302*	Python Programming Language	CC	3	-	-	20	20	-	60	-	100	8	8	-	24	-	40	3
BITT-303*	C++ Programming Language																	
BITT-304#	SQL & Oracle	DSE	3	-	-	20	20	-	60	-	100	8	8	-	24	-	40	3
BITT-305#	HTML 5 and CSS																	
BITT-306	Networking Fundamental	DSE	3	-	-	20	20	-	60	-	100	8	8	-	24	-	40	3
BITT-307	Quantitative and Qualitative Aptitude	AECC	2	-	-	20	20	-	60	-	100	8	8	-	24	-	40	2
BITP-308*	Pract. Based on BITT-302	CC	-	-	4	-	-	20	-	30	50	-	-	8	-	12	20	2
BITP-309*	Pract. Based on BITT-303																	
BITP-310#	Pract. Based on BITT-304	DSE	-	-	4	-	-	20	-	30	50	-	-	8	-	12	20	2
BITP-311#	Pract. Based on BITT-305																	
BITP-312	Pract. Based on BITT-306	DSE	-	-	4	-	-	20	-	30	50	-	-	8	-	12	20	2
OEC-C2	Open Elective Course : C2	DSE	-	-	2	-	-	20	-	30	50	-	-	8	-	12	20	1
	Total		14	1	14	90	100	90	300	120	700							22

L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.

PROGRAM : B.Sc. (Information Technology) : Second Year																		
Semester IV																		
Course code*	**Course Title**	**Type**	**Teaching Scheme**			**Evaluation Scheme**						**Minimum Passing**						**Credit**
						Internal			**External**		Total	**Internal**			**External**		Total	
(Mandatory)			L	T	P	CA	MSE	TW	ESE	PR		CA	MSE	TW	ESE	PR		
BITT-401	Software Testing	CC	3	1	-	10	20	10	60	-	100	4	8	4	24	-	40	4
BITT-402*	Machine Learning with Python	CC	3	-	-	20	20	-	60	-	100	8	8	-	24	-	40	3
BITT-403*	Java Programming																	
BITT-404#	Data Warehousing & Data Mining	DSE	3	-	-	20	20	-	60	-	100	8	8	-	24	-	40	3
BITT-405#	Java Script																	
BITT-406	Network Securities	DSE	3	-	-	20	20	-	60	-	100	8	8	-	24	-	40	3
BITT-407	Environment	AECC	2	-	-	20	20	-	60	-	100	8	8	-	24	-	40	2
BITP-408*	Pract. Based on BITT-402	CC	-	-	4	-	-	20	-	30	50	-	-	8	-	12	20	2
BITP-409*	Pract. Based on BITT-403																	
BITP-410#	Pract. Based on BITT-404	DSE	-	-	4	-	-	20	-	30	50	-	-	8	-	12	20	2
BITP-411#	Pract. Based on BITT-405																	
BITP-412	Pract. Based on BITT-406	DSE	-	-	4	-	-	20	-	30	50	-	-	8	-	12	20	2
OEC-C3	Open Elective Course : C3	DSE	-	-	2	-	-	20	-	30	50	-	-	8	-	12	20	1
	Total		14	1	14	90	100	90	300	120	700							22
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.																		

PROGRAM : B.Sc. (Information Technology) : Third Year																		
Semester V																		
Course code*	**Course Title**	**Type**	**Teaching Scheme**			**Evaluation Scheme**						**Minimum Passing**						**Credit**
						Internal			**External**		Total	**Internal**			**External**		Total	
(Mandatory)			L	T	P	CA	MSE	TW	ESE	PR		CA	MSE	TW	ESE	PR		
BITT-501	Internet of Things	CC	3	1	-	10	20	10	60	-	100	4	8	4	24	-	40	4
BITT-502*	Artificial Intelligence	CC	3	-	-	20	20	-	60	-	100	8	8	-	24	-	40	3
BITT-503*	Android																	
BITT-504#	Data Science	DSE	3	-	-	20	20	-	60	-	100	8	8	-	24	-	40	3
BITT-505#	Advances in PHP																	
BITT-506	Ethics & Cyber Law	DSE	3	-	-	20	20	-	60	-	100	8	8	-	24	-	40	3
BITT-507	**Course Based on Industrial Training Tool**	AECC	2	-	-	20	20	-	60	-	100	8	8	-	24	-	40	2
BITP-508*	Pract. Based on BITT-502	CC	-	-	4	-	-	20	-	30	50	-	-	8	-	12	20	2
BITP-509*	Pract. Based on BITT-503																	
BITP-510#	Pract. Based on BITT-504	DSE	-	-	4	-	-	20	-	30	50	-	-	8	-	12	20	2
BITP-511#	Pract. Based on BITT-505																	
BITP-512	Pract. Based on BITT-506	DSE	-	-	4	-	-	20	-	30	50	-	-	8	-	12	20	2
OEC-C4	Open Elective Course : C4	DSE	-	-	2	-	-	20	-	30	50	-	-	8	-	12	20	1
	Total		14	1	14	90	100	90	300	120	700							22
Semester VI																		
BITP-601 P	Project / Industrial Internship	DSE	-	-	22	-	-	200	-	300	500	-	-	8	-	12	20	22
BITP-602 P	Seminar	DSE	-	-	4	-	-	80	-	120	200	-	-	8	-	12	20	4
	Total		-	-	26	-	-	280	-	420	700							26

L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.

Semester: First

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-101	Advances in Information Technology	3	1	-	10	20	10	60	-	100	4
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Basic knowledge of computer, its operations and applications.										
Course Objective:	• To understand basic topics and the current trends that are essential to IT industry. • To analysis the challenges & job opportunities in the Information technology fraternity.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Understand the current trends, job opportunities and challenges of IT industries.	**L1, L2.**
2.	Identify the different elements of an information system, including input, output and processing elements.	**L1,L2, L3**
3.	Identify Digital Model : E-commerce & M-commerce	**L1,L2, L3**
4.	Recognize and distinguish the role of IT	**L3**
5.	Identify the components of a computer system, including hardware components and software applications.	**L2, L3**

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT- I** **Information Technology Basics** ➢ Introduction ➢ New Communication Models: Internet, Intranet, extranet, Video-conferencing, Audio-conferencing, Telepresence, Internet Telephony, Webcasting, Social Networking, Computer Supported Co-operative Working(CSCW) ➢ New Model in Digital Economy: E-commerce, M-Commerce. ➢ Why Learn about IT **Information Systems Overview** ➢ Define basic information system terms; identify types of information systems. **Role of IT in Organization:** ➢ Functional Areas of an Organization ➢ Role of IT in Human Resource Management ➢ Role of IT in Finance and Account Management ➢ Role of IT in Marketing Management ➢ Role of IT in Information System Management ➢ Role of IT in Operations Management.	**18**	**L1,L2, L3**
B	**UNIT- II** **Computer Hardware & Software:** ➢ Computer and its Characteristics ➢ Identify the different hardware components of a computer system, including CPU, RAM. ➢ Input/output devices and storage devices; ➢ Evaluate examples of software applications.	**15**	**L1,L2, L3**

C	**UNIT- III** **Emerging Trends in Information Technologies, Challenges and job opportunities in the fields:** ➢ Machine Learning with advance Artificial Intelligence (AI) ➢ Quantum Computing (Supercomputing) ➢ Augmented Reality (AR) and Virtual Reality (VR) ➢ Global Internet of Things (IoT) ➢ Block chain technology ➢ Data Science & Business Analytics ➢ Deep Learning ➢ Drones Technology ➢ Cloud computing ➢ Robotic Process Automation (RPA) ➢ Design Thinking	**12**	**L1,L2**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Information Technology: Theory And Practice	Sinha, Pradeep K., Sinha, Priti		
2.	Introduction to Information Technology:	V. Rajaraman		Third
3	Introduction to Information Systems	Rainer, Prince, Cegielski	Wiley	Fifth

Website Resources:

1. https://comptiacdn.azureedge.net/webcontent/docs/default-source/research-reports/comptia-it-industry-outlook-2020.pdf?sfvrsn=8869ad68_0
2. https://magazine.startus.cc/top-5-information-technology-trends-define-2020/

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ Ask Question	☐ Presentation	☐ Brainstorming
☐ Show Video	☐ Interactive Lecture	☐ Case-Study
☐ Learning Activities	☐ Think-pair-share	☐ Project Based Learning
☐ Scenario	☐ Demonstration	☐ Group Discussion
☐ Share a Problem	☐ Fish Bowl	☐ Flipped Classroom

Course Assessment and Grading Tools:

☐ Quiz	☐ Rubric
☐ Assignment	☐ Checklist
☐ Review of research paper	☐ Marks
☐ Presentation	☐ Test

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITP-101	Practical Based on Open-Office	-	-	2	-	-	20	-	30	50	1
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											

List of Practical's:-

Experiment No.	Experiment Topics
1.	Create a Word Documents for a) Personal Letter b) Official Letter c) Create a Letter Head of the Company d) Prepare an Advertisement e) Time-Table for the School.
2.	Create a Word Documents for a) Resume b) News in the Newspaper Format. c) Bookmark & Hyperlink the documents. d) Header and Footer, Page Design. e) Mathematical Equation.
3.	Create a Word Documents for a) Create a Cover page of Project Report b) Certificate for Tutorial / Assignment c) Invitation Card of Your Birthday Party. d) Mail-Merge
4.	Create a Presentation for a) Feature & Parts of Plants. b) Memories of My tour.
5.	Create a Presentation for a) Transition & Animation effects. b) Prepare Template for the Project Demo.
6.	Create a Worksheet a) Mark-Memo of an individual b) Salary Sheet of Company
7.	Create a Worksheet a) Use of Mathematical formula in the Excel-sheets. b) Preparation of Result Sheet of class. c) Conditional formatting
8.	Create a Worksheet a) Sorting, Searching and Filter b) Prepare the different types of Graphs

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-102	Programming logic and Design	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Understanding of the Programming Concept and problem solving steps.										
Course Objective:	• Programming Paradigm help students to **create** properly designed programs. • Learning algorithms and practicing coding. • Come up with varieties of solutions to a single problem. • Programming concepts enforces good style and logical thinking.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Recognize and Understand components of Computer System, Programming and most importantly summarize the advantages of structured programs.	**L1, L2.**
2.	Describe the Modularization and basic structure of program.	**L1, L2, L3.**
3.	Implements and Analyze the usage of flowcharts and pseudo code so as to become comfortable with logic development tools and understand their interrelationship.	**L1, L2, L3, L4.**
4.	Determine and explore the workings of decision making, looping, and array manipulation.	**L1, L2, L3, L4, L5.**
5.	Create Complex programs to build and process using significant amount of data and solve the real-life problem.	**L1, L2, L3, L4, L5, L6.**

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT - I** **An Overview of Computers and Programming:** ➢ Computer System, Programming Logic, Program Development Cycle, Pseudo code Statements & Flowchart, Programming and User Environments, Evolution of Programming Model. **Elements of High-Quality Programs:** ➢ Declaring and Using Variables and Constants, Operators: Performing Arithmetic Operations, Modularization: Modularizing a Program and its Advantages, Creating Hierarchy Charts, Features of Good Program Design. **Understanding Structure:** ➢ The Disadvantages of Unstructured Spaghetti Code, Three Basic Structures - sequence, selection and loop, using a Priming Input to Structure a Program, Reasons for Structure, Recognizing Structure, Structuring and Modularizing Unstructured Logic.	**15**	**L1, L2, L3**
B	**UNIT - II** **Making Decisions:** ➢ Boolean Expressions and the Selection Structure, Using Relational Comparison Operators, Understanding AND Logic, OR Logic & NOT Logic, Making Selections within Ranges, Precedence Combining AND & OR operators. **Looping:** ➢ Advantages of Looping, Loop Control Variable, Nested Loop, Avoiding Common Loop Mistakes, Using a ***'for'*** Loop, Common Loop Applications.	**12**	**L1, L2, L3, L4**

C	**UNIT - III** **Arrays:** ➢ Storing Data in Arrays, How an Array Can Replace Nested Decisions, Using Constants with Arrays Searching an Array for an Exact Match, Using Parallel Arrays, Searching an Array for a Range Match, Remaining within Array Bounds, Using a for Loop to Process an Array. **File Handling and Applications:** ➢ Understanding Computer Files, Data Hierarchy, Performing File Operations, Sequential Files and Control Break Logic, Merging Sequential Files, Master and Transaction File Processing, Random Access Files.	**18**	**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Programming Logic and Design	Joyce Farrell	Cengage Learning	Seventh
2.	Programming Language Design Concepts	David A Watt	Wiely India	

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Test**

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITP-102	Practical Based on BITT-102	-	-	4	-	-	20	-	30	50	2
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											

List of Practical's:- Programming Language Concept practical's are to be performed using C Programming Language.

Experiment No.	Experiment Topics	
1	Introduction to C, Syntax and basic structure of C program, Execution of C program.	
2	Get students familiar with different datatypes in C, operators and expressions in C.	
3	Understanding decision making using forms of IF statements	
4	Understanding decision making using forms of switch, goto, break, continue etc. statements	
5	Perform different programs to understand the concept of Array.	
6	To apply the knowledge of array to upgrade it on multidimensional array	
7	Programs to understand the concepts of loops in the programming.(For loop)	
8	Programs to understand the concepts of loops in a program. (do and while loop)	
9	Programs to understand the concepts of file handling- types of files, creating file with different modes(w, a, r)	
10	Programs to understand the concepts of file handling- reading and writing a file.	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-103	Computing Hardware	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Basic Number System & elementary knowledge of computers.										
Course Objective:	• To Learn & Understand the different number system. • To understand the basic components and it's working in the computers. • To know about the latest processors available in the market used by manufacturers.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Understand the various number system	**L1, L2**
2.	Compute binary arithmetic operations.	**L1, L2, L3**
3.	Design combinational and sequential circuits using gates.	**L1, L2, L3, L4**
4.	Understand the Various Microprocessor & its architecture.	**L1, L2**
5.	Classify Interrupt and Interrupt Applications	**L3, L4, L5**

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT – I** **Computer Arithmetic:** ➢ Number System: Decimal System, Binary Number System, Hexadecimal Number System.	**05**	**L1, L2, L3, L4**

	➢ Number Conversion: Decimal to Binary, Decimal to Hexa, BCD Numbers, ASCII Code, Representation of –ve number. ➢ Computer Arithmetic: Addition, Subtraction. **Logic Gates & Boolean Algebra** ➢ Positive & Negative Logic, Truth Table ➢ Logic Gates: AND, OR, NOT, NAND, NOR and Exclusive-OR Gate, Universal Gates. ➢ Postulates & Theorems of Boolean Algebra (Idempotent, Complementation, Commutative, Associative, Distributive, DeMorgan's Theorem). **Arithmetic Circuits:** ➢ Combinational Circuits, Implementing Combinational logic. ➢ Arithmetic Circuits: Half-Adder, Full-Adder, Half-Subtractor, Full-Subtractor. ➢ Adder-Subtractor, BCD Adder. ➢ Multiplexers and Demultiplexers.	**05** **05**	
B	**UNIT- II** **Fundamentals of Microprocessors:** ➢ Comparison of 8-bit, 16-bit and 32-bit microprocessor. ➢ RISC and CISC Architectures. ➢ 8086 Internal Architectures ➢ Execution Unit & Bus Interface ➢ Addressing Modes **8086 Hardware & Addressing Decoding** ➢ Pin Configuration ➢ Clock ➢ Processor Activities: Interrupt lines, DMA, TEST, BHE ➢ Maximum Mode ➢ Instruction Cycle. ➢ Memory Device pins, Memory Addressing Decoding ➢ Memory Banks ➢ I/O Address Decoding	**20**	**L3, L4, L5**

	8086 Interrupt and Interrupt Applications: ➢ Interrupts of 8086 ➢ Dedicated Interrupt types ➢ Hardware Interrupts, Software Interrupts ➢ Priority of Interrupts.		
C	**UNIT - III** **Pentium Processor Architecture:** ➢ Introduction to Pentium Processor Architecture ➢ Pentium Architecture ➢ Pentium Pro ➢ Pentium-II and Pentium-III ➢ Pentium-IV ➢ Latest trends in Microprocessor Design: Multicore Processor and Multicore Processing ➢ Multicore Technology and Intel ➢ Dual Core and Core Duo Processors ➢ Mobile Processors.	**10**	**L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	**Digital Electronics: Principles, Devices and Applications**	**Anil K. Maini**	Wiley Publication	
2.	**Micro Processors & Multicore systems**	**Lyla B Das**	Pearson Publication	
3	**Microprocessor and Interfacing**	**Douglas V Hall**	Tata McGraw Hill	

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Test**

Course code	Course Title	Teaching Scheme			Evaluation Scheme					Total	Credit
					Internal			External			
		L	T	P	CA	MSE	TW	ESE	PR		
BITP-103	Practical Based on BITT-103	-	-	2	-	-	20	-	30	50	2
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											

List of Practical's:-

Experiment No.	Experiment Topics	
1.	Microcomputer Structure and Operation. Computer Languages.	
2.	**Program structures in 8086 Assembly Languages:** ➢ Data Transfer Instructions ➢ Sequence Program - Branch instructions	
3.	**Arithmetic Instruction :** ➢ Programs Involving Arithmetic with 8 bit, 16-bit	
4.	**Bit and Logical Operations**	
5.	**Shift and Rotate Instructions**	
6.	**Instruction timing and delay loops**	

Note: Additional practical's as per the requirement and suggestion given by the course co-ordinator.

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-104	Basic Mathematics	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Secondary Level of Mathematics basic.										
Course Objective:	• Align the students with the importance of Mathematics. • **Apply** the knowledge of Basic discrete and Numerical mathematics. • **Create** the Coding for implementation of algorithms in the Computer.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Analyze the fundamental of Set Theory & Solve the Set Operation	**L1, L2,**
2.	Understand the Relation & Binary Functions	**L,1,L2, L3**
3.	Solve the problem based on Permutation & Combination	**L1, L2,L3**
4.	Differentiate between linear and non-linear equation and solve them using various methods	**L,1,L2, L3,L4**
5.	Design & Compute the Regression problems.	**L1, L2,,L3,L4, L5**

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT-I** **Sets Theory:** ➢ Fundamental Concepts of Set Theory ➢ Combination of Set, Algebra of Set Operations ➢ Representation of Set using Venn Diagram	**20**	**L1,L2,L3**

	➢ Finite and Infinite Sets ➢ Principle of Inclusion and Exclusion **Relation and Functions:** ➢ Binary Relations ➢ Properties of Binary Relations ➢ Equivalence Relation, Partial Order Relations. ➢ Function, Tabular Representation and type of function **Permutation and Combination:** ➢ Fundamental of Principles ➢ Permutation and Combination		
B	**UNIT-II** **Numerical Method: Error in Calculation** ➢ Significant Error, Absolute, Percentage, Relative Error ➢ Chopping off and Rounding off Error. ➢ Truncation Error, Propagation Error **Matrices and Determinants.** ➢ Definitions, Matrix Operations ➢ Determinant of Square Matrix, Cofactor ➢ Adjoint of Matrix, Inverse of Matrix, Rank of Matrix **Numerical Solutions of Non-Linear Equations** ➢ Concept of Iterative Methods, Search Method for Initial Guess. ➢ Bisection Method , False Position Method ➢ Newton-Raphson Method	**10**	**L1,L2,L3, L4**
C	**UNIT-III** **Interpolation** ➢ Interpolation & Extrapolation ➢ Newton Forward & Backward Interpolation ➢ Central Divided Difference & Lagrange's Interpolation **Regression Analysis:** ➢ Linear Regression ➢ Non-Linear Regression ➢ Polynomial Regression. ➢ Least Square Fit & Best Fit	**15**	**L3, L4,L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Discrete Mathematics	Dr. Bembalkar		
2.	Elements of Discrete Mathematics	C.L. Liu,	Tata McGraw-Hill	
3	Numerical Computational Methods	Dr. P.B. Patil	Narosa Publication	
4	Numerical Methods For Scientific And Engineering Computation	M.K.Jain & R.K. Jain	New Age International	Fourth

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Test**

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITP-104	Practical Based on BITT-104	-	-	4	-	-	20	-	30	50	2
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											

List of Practical's:-

Experiment No.	Experiment Topics	
1.	Practical Based on Set Theory: Algebra of Set Operation	
2.	Representation of Set Using Venn Diagram	
3.	Determinant of Square Matrix, Cofactor	
4.	Ad joint of Matrix, Inverse of Matrix, Rank of Matrix	
5.	Programs Based on Iterative Methods : Bisection	
6.	Programs Based on Iterative Methods : False Method	
7.	Programs Based on Iterative Methods : Newton Raphson	
8.	Programs Based on Interpolation using Newton Forward Method.	
9.	Programs Based on Interpolation using Newton Backward Method.	
10.	Programs Based on Interpolation using Central Divided difference Method.	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-105	Communicative English - I	2	-	-	20	20	-	60	-	100	2
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Basic knowledge in English language both reading and writing										
Course Objective:	• To compose themselves to speak with varieties of people. • Demonstrate, listen and present your own ideas to the world appropriately. • To write clearly and concisely, work well within the team at the workplace.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Understand to create and compose the sentences.	**L1,L2**
2.	Choose and compare cum analyze our own creativity.	**L1,L2,L3**
3.	Simplify and present our own created work.	**L1,L2,L3,L4,L5**
4.	Discuss cum interpret and quote precisely.	**L1,L2,L3,L4,L5,L6**

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT - I** **Communication skills** ➢ Introduction: Communication—meaning and definition, ➢ Importance and scope of communication, ➢ Objectives of communication, ➢ Evolution & elements of Communication process,		L1,L2,L3,L4

	➢ Barriers in the process of communication, overcoming the barriers, ➢ Classification of communication, ➢ 7 c's of communication **Communication skills-Nonverbal communication** ➢ Verbal communication ➢ Meaning and definition, advantages and disadvantages ➢ Nonverbal communication ➢ Meaning and definition ➢ Constituents of nonverbal communication—body-language, postures and gestures, eye contact, space in communication, paralanguage, appearance.	**20**	
B	**UNIT-II** **Speaking Skills** ➢ Monologue ➢ Dialogue ➢ Effective Communication/ Mis-Communication ➢ Public Speech ➢ Extempores **Writing Skills** ➢ Documenting ➢ Making notes ➢ Letter writing ➢ Agenda, notices and circulars	**25**	L1,L2,L3,L4

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Fluency in English - Part II		Oxford University Press	
2.	Business English		Pearson,	
3.	Language, Literature and Creativity,		Orient Blackswan	
4.	Language through Literature	Dr. Gauri Mishra, Dr Ranjana Kaul, Dr Brati Biswas		

Semester: Second

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-201	Database technologies and Applications	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Understanding of computer software, basic computer concepts such as memory, database, data structures and algorithms.										
Course Objective:	• Understand the concept of database & its component. • Create & Implement the data Model in Computer.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Recognize and understand the basic concepts of database, knowledge, classifications of Architecture of database, database users, define advantages of database.	**L1**
2.	Describe the components of database system, define transaction , data modeling	**L1, L2**
3.	Draw E-R diagram, schema diagram, classify attributes, entity, entity set, relationship	**L1,L2**
4.	Implement DDL,DML.DCL Commands, set operations	**L1,L2,L3**
5.	Create database, tables, apply constrains on it, displaying multiple data from multiple tables.	**L4,L5**

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT-I** **Introduction to Basic Concepts of DBMS:** ➢ Database System Application ➢ Purpose of Database System ➢ Database Architecture : 3-Level architecture ➢ Database Users & Administrators Responsibilities ➢ Functional Components of Database system: Storage & Query Processor ➢ Transaction Management	**12**	**L1,L2**
B	**UNIT-II** **Data Modeling & Design:** ➢ Type of Data Model: a. Relation Data Model b. E-R Data Model c. Object Based Data Model d. Semi-Structured Data Model e. Hierarchical & Network Data Model ➢ E-R Data Model: Entity, Entity set, Entity types, Attributes, Types of Attributes, E-R diagram. ➢ Mapping Cardinalities , Data Association ➢ Constraints : Integrity constraints I & II ➢ Database Design : Overview of Design Process, Designing Phase, Normalization(1NF,2NF,3 NF)	**15**	**L1,L2,L3**
C	**UNIT-III** **Relational Data Model** ➢ Basic Structure ➢ Database Schema ➢ Integrity Rules ➢ E.F.Codds Rules ➢ Relational Algebra: Union , Intersection , Difference, Cartesian Product, Selection , Projection, Join : Natural & Outer Join, Division	**18**	**L4, L5**

	Introduction to SQL & Pl/SQL: ➢ Introduction to SQL, Types of SQL: DDL, DML, DCL. ➢ Features of Pl/SQL, Advantageous & Disadvantageous. ➢ Basic Syntax ➢ Cursor, Triggers & Stored Procedure		

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Database System concepts	Korth, Siberschatz ,		Fifth
2.	An Introduction to Database System	B.Desai		Revised
3	SQL Primer: An Accelerated Introduction to SQL Basics	Rahul Batra	Apress	

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Test**

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITP-201	Practical Based on BITT-201	-	-	4	-	-	20	-	30	50	2
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											

List of Practical's:-

Experiment No.	Experiment Topics		
1	Design and draw E-R diagrams.		
2	Study of Basic Operations of Relational Algebra with examples(Union, Intersection, difference & Cartesian Product)		
3	Study of Selection and Projection Operations with examples		
4	Study of Join(natural, Inner, outer, left& right) and Division Operations with examples		
5	Study of DDL commands(create & Alter), DML commands (Insert, update & delete) & DCL commands(GRANT & REVOKE)with examples		
6	Study of Constraints: Rule 1 & 2, advanced constraints like primary key, foreign key, unique and check constraints on tables with Examples		
7	Write & execute queries using select command using where, group by, order by and having clauses		
8	Study of Single Row Functions with examples		
9	Study of conversion functions with examples		
10	Study of Conditional Expressions with examples		
11	Study of Aggregated functions with examples		
12	Study of Sub queries with examples		
13	Study of Set Operators with examples		
14	Study of Displaying Data from Multiple tables		
15	Study of Cursor and Triggers		
16	Study of Stored Procedure		

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-202	Algorithm Design & Data Structures	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Basic knowledge about the Computer hardware, software and basic of C Programming Language.										
Course Objective:	• Apply the Knowledge of Data Structure to flexibly work with various types of data structure. • Implement various algorithms of Data Structures using their programming logics.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Recognize and Understand basic terminologies of Data structure, classification, and most importantly summarize the advantages of Data structure with Arrays and its operations.	L1, L2.
2.	Describe the Modularization and basic structure of algorithms and programs of Linked list and Trees.	L1, L2, L3.
3.	Implements and Analyze the usage of Graph, Stack, Queues and Recursion.	L1, L2, L3, L4.
4.	Determine and explore the workings of making, looping, and array manipulation and many more concepts of programming.	L1, L2, L3, L4, L5.
5.	Create Complex programs to build and process using significant amount of data and solve the real-life problems with all the concept of data structure.	L1, L2, L3, L4, L5, L6.

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT - I** **Introduction to Data Structure:** ➢ Define data structure, classification and types of data structure ➢ Data Organization and Data Structure ➢ Basic Terminology: Data item, Fields, Records, Files, Entity, Attributes **Arrays** ➢ Representation of Linear Arrays ➢ Traversing, Insertion and Deletions ➢ Sorting & Searching Algorithms ➢ Multidimensional Arrays: 2D & M-D Concept ➢ Record: Record Structures, Representation in Memory	**15**	**L1, L2, L3**
B	**UNIT-II** **Linked List** ➢ Concept of Linked List ➢ Representation of linked List in memory ➢ Traversing a linked list ➢ Searching a linked list: sorted and unsorted ➢ Insertion & Deletion in Linked List ➢ Header Linked List & Two way List **Trees:** ➢ Trees: Binary tree, Representation of Binary tree in memory, Linked representation of binary tree, Operation on tree traversing, Insertion. Deletion,	**15**	**L1, L2, L3, L4**
C	**UNIT-III** **Graphs:** ➢ Graphs and their applications: Graphs and Multigraphs, Directed Graphs, Shortest Path Algorithm, Linked Representation of Graph, Operation on Graph traversing, Insertion. Deletion. **Stacks, Queues, Recursion** ➢ Stack: Operation, Array Representation of Stack, linked representation of stack, ➢ Arithmetic Expression POLISH & POSTFIX, ➢ Application of stacks: Quicksort, Recursion. ➢ Queue: Representation of queues & link. ➢ Types of Queues: Deques & Priority Queue	**15**	**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Fundamentals of Data structures	Horowitz & Sahani	Galgotia pub	
2.	An introduction to data structures and application	Jean Paul Tremblay & Pal G. Sorenson	McGraw Hill	
3	Data Structures	Tannenbaum	PHI	

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ Ask Question	☐ Presentation	☐ Brainstorming
☐ Show Video	☐ Interactive Lecture	☐ Case-Study
☐ Learning Activities	☐ Think-pair-share	☐ Project Based Learning
☐ Scenario	☐ Demonstration	☐ Group Discussion
☐ Share a Problem	☐ Fish Bowl	☐ Flipped Classroom

Course Assessment and Grading Tools:

☐ Quiz	☐ Rubric
☐ Assignment	☐ Checklist
☐ Review of research paper	☐ Marks
☐ Presentation	☐ Test

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITP-202	Practical Based on BITT-202	-	-	4	-	-	20	-	30	50	2
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											

List of Practical's:-

Experiment No.	Experiment Topics		
	Basic revision of Programming C : ➢ Write a program using DIV(J,K) which reads a positive integer N>10 and determines whether or not N is a prime number. ➢ Write a program which counts the number of particular character/word in the String. ➢ Write a program which reads words WORD1 and WORD2 and then replaces each occurrence of word1 in text by word2	Introduction about our Practical Session strategy	Distribution of Topics and Tentative dates to students
	Array: ➢ Implementation Traversing algorithm of Array: Write the programs for traversing of n item using the array. ➢ Implementation Deletion algorithm of Array: Write the programs for insertion and deletion of n item using the array.	Term Work (TW) Two Assignment Question on Array	Conducting seminar on Array
	Searching: ➢ Implement linear search algorithm using C. ➢ Implement binary search algorithm using C.	Term Work (TW) Two Assignment Question on Searching	Conducting seminar on Searching
	Sorting: ➢ Implement Bubble sort algorithm using C.	Term Work (TW) Two Assignment Question on Sorting	Conducting seminar on Sorting
	Linked List:	Term Work (TW) Two Assignment	

	➢ Implementation traversing algorithm of Linked List: Write the programs for traversing of n item from the linked list.	Question on Linked List	Conducting seminar on Linked List
	Stack: ➢ Implementation Insertion and Deletion algorithms of Stack: Write the programs for push and pop operation using the stacks.	Term Work (TW) Two Assignment Question on Stack	Conducting seminar on Stack
	Queue: ➢ Implementation Insertion and Deletion algorithms of Queue: Write the programs for insertion and deletion of n item from the queues.	Term Work (TW) Two Assignment Question on Queue	Conducting seminar on Queue
	Tree: ➢ Implementation Traversing algorithm of Tree: Write the programs for traversing of n item using the Tree.	Term Work (TW) Two Assignment Question on Tree	Conducting seminar on Tree
	Graph: ➢ Implementation Traversing algorithm of Graph: Write the programs for traversing of n item using the Graph.	Term Work (TW) Two Assignment Question on Graph	Conducting seminar on Graph
	Recursion: ➢ Implement the concept of recursion using programming logic	Term Work (TW) Two Assignment Question on Recursion	Conducting seminar on Recursion

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-203	Introduction to Statistic for Data Analysis	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Being the basic level course requires elementary level of mathematics.										
Course Objective:	• To emphasis descriptive statistics. • Understand various statistical methods: measures of central tendency, measure of dispersion and correlation. • To implement the logic & methods of Statistics for Data Analytics.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Understand the elementary statistical methods.	**L1, L2**
2.	Apply the measures of central tendency, measure of dispersion and co-relation to solve our day-today life problem.	**L1, L2, L3**
3.	Analyze the data to represent it graphically or tabulate and interpret it to generate information.	**L1, L2, L3, L4**
4.	Compare data to tabulate statistical information given in descriptive form.	**L1, L2,L3,L4,L5**

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT-I** **Statistical Methods:** ➢ Definition, scope and importance of Statistics, concepts of statistical population and sample. **Data & Types of data:** ➢ Primary and Secondary data, qualitative & quantitative data, Numerical (discrete, continuous), Categorical and Ordinal. Cross-section, time series, failure, industrial, directional data. attributes, variables, **Processing of Data:** ➢ Completeness, Consistency, Accuracy and Editing. Accuracy of Measurement. **Classification, Tabulation and Graphical Representation:** ➢ Preparation of Tables, Presentation of Data: Variable, Random Variable, Frequency, And Frequency Distribution. Diagrammatic representation of Data: Line and Bar Diagram**,** Histogram**,** Component Bar diagram**,** Pie Chart**,** Line Graph, Frequency polygon and Ogive. **Measures of Skewness and Kurtosis:**	**15**	**L1 , L2, L3**
B	**UNIT-II** **Measures of Central Tendency:** • Characteristics of Good measure of Central Tendency. Concept of central tendency- for Group and Ungroup data. • **Mean:** ➢ **Arithmetic mean (A.M.)**: simple and weighted Merits and demerits. ➢ **Geometric mean (G.M.):** computation for G M, Merits demerits and applications of G.M. ➢ **Harmonic Mean (H.M.):** computation for frequency, non-frequency data, merits and demerits of H.M. **Median:** ➢ Definition, Median for grouped and non-grouped data, Properties and Merits & demerits.	**15**	**L1, L2, L3, L4, L5**

	Mode: ➢ Definition, Mode for grouped & Non-grouped data, Graphical Method for finding mode, Merits and demerits.		
C	**UNIT -III** **Measures of Dispersions:** Purposes of Measure of Dispersion, Properties of Good measures of Dispersion. ➢ **Range** ➢ **Quartile Deviation & Mean Deviation:** ➢ **Variance:** ➢ **Standard Deviation:** ➢ **Coefficient of Variation:** **Bivariate data:** ➢ Definition, scatter diagram, simple, partial and multiple correlation (3 variables only), rank correlation. Simple linear regression.	**15**	**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Basic Statistics	B.L.Agarwal	New Age (P) Limited.	Fourth
2.	Fundamental of Mathematical Statistics	S. C. Gupta & V. K. Kapoor	Sultan Chand & Sons	
3	Fundamental of Statistics	S. C. Gupta		
4.	Mathematical Statistics	Kapoor J. N & Saxena S. C.		

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Test**

Course code	Course Title	Teaching Scheme			Evaluation Scheme					Total	Credit
					Internal			External			
		L	T	P	CA	MSE	TW	ESE	PR		
BITP-203	Practical Based on BITT-203	-	-	2	-	-	20	-	30	50	1
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											

List of Practical's:-

Experiment No.	Experiment Topics	
1	Definition of Statistic, Data & Types of data	
2	Presentation of Data: Frequency, And Frequency Distribution. Diagrammatic representation of Data: Line and Bar Diagram, Histogram, Component Bar diagram, Pie Chart, Line Graph, Frequency polygon and Ogive.	
3	Arithmetic mean (A.M.): Formula, Problems based on AM	
4	Tabulated & Class based AM Problems.	
5	Geometric mean (G.M.): Formula, Problems based on GM	
6	Harmonic Mean (H.M.): Formula, Problems based on HM	
7	Median: Computation & Problem based on Median.	
8	Mode: Computation & Problem based on Mode.	
9	Range, Quartile Deviation Mean Deviation: Problems	
10	Variance & Standard Deviation:	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-204	Open Source: Operating System	3	1	-	10	20	10	60	-	100	4
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Prior Knowledge about the Computer System and its hardware and software.										
Course Objective:	Introduce modern operating systems basic concepts, policies, and mechanisms.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Compare various process scheduling algorithm.	
2.	Apply the principles of concurrency.	
3.	Design deadlock, prevention and avoidance algorithms.	
4.	Compare and contrast various memory management schemes.	
5.	Perform administrative tasks on Linux Servers/Windows O.S.	

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT-I** **Introduction to Operating System:** ➢ Operating System Definition ➢ OS as resource management ➢ Structure of Operating System, ➢ Component of Computer System, ➢ Services provided by Operating System, ➢ Types of Operating System	**15**	**L1, L2**

B	**UNIT-II** **Processes and Threads** ➢ Process concept: PCB, Process State, Operation on Process. ➢ Concurrency: Concurrent process, Threads, Multithreading ➢ Synchronization ➢ Deadlock **CPU Scheduling** ➢ Time-slicing and the quantum ➢ Preemptive and non-preemptive algorithms **Memory Management** ➢ Main memory organization and management ➢ Virutal memroy organization ➢ Paging and Segmentation ➢ Virtual memory management algorithms and issues	**15**	**L1, L2, L3**
C	**UNIT - III** **Linux System** ➢ Basic Concepts; System Administration-Requirements for Linux System Administrator, Setting up a LINUX Multifunction Server, Domain Name System, Setting Up Local Network Services; ➢ **Virtualization-** Basic Concepts, Setting Up Xen, **VMware** on Linux Host and Adding Guest OS, ➢ **Docker:** Overview, Features, Components of Docker, Architecture.	**15**	**L1, L2, L3, L4**

Books and References:

SR. NO.	Title	Author	Publishers	Edition
1.	Operating System Concepts	A. Silberschatz , P.B. Galvin & G. Gagne	John Wiley and Sons Inc	Eighth
2.	Guide to Operating Systems	Greg Tomsho	Cengage Learning	Fifth
3	Operating System Concepts and Basic Linux Commands	Shital Vivek Ghate		
4.	Docker: A Quick-start Beginner's Guide	Andy Hayes	CreateSpace Independent	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-205	Communicative English–II	2	-	-	20	20	-	60	-	100	2
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Basic knowledge in English language both reading and writing										
Course Objective:	To compose themselves to speak with varieties of people. Demonstrate, listen and present your own ideas to the world appropriately. To write clearly and concisely, work well within the team at the workplace.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Understand to create and compose the sentences.	L1,L2
2.	Enables us to choose and compare cum analyze our own creativity.	L1,L2,L3
3.	Enables us to simplify and present our own created work.	L1,L2,L3,L4,L5
4.	Enables us to discuss cum interpret and quote precisely.	L1,L2,L3,L4,L5,L6
5.	Understand outline to create and compose yourself in the corporate world.	L1,L2,L3,L4,L5,L6

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT - I** **Speaking Skills** ➢ Presentations ➢ Interviews ➢ Group discussions ➢ Anchoring **Writing Skills** ➢ Resume writing ➢ Covering letter ➢ Email writing ➢ Report Writing ➢ Academic Writing	20	**L1, L2, L3, L4**
B	**UNIT-II** **Listening Skills & Reading Skills** ➢ Listening : Active and Passive Listening ➢ Reading: Techniques of Reading: Skimming & Scanning, ➢ Comprehension, Summary Paraphrasing, Analysis and Interpretation ➢ Translation(from Indian language to English and vice-versa) Literary/Knowledge Texts **soft-skills** ➢ Interpersonal communication ➢ Cross-cultural communication ➢ Business Etiquette--Email etiquette, Telephonic etiquette, dressing etiquette	**25**	**L1, L2, L3, L4**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Fluency in English - Part II		Oxford University Press	
2.	Business English		Pearson,	
3.	Language, Literature and Creativity,		Orient Blackswan	
4.	Language through Literature	Dr. Gauri Mishra, Dr Ranjana Kaul, Dr Brati Biswas		

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Test**

Semester: Third

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-301	Software Project Management	3	1	-	10	20	10	60	-	100	4
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Fundamental of Software and its application area										
Course Objective:	To understand the Software Project Planning and Evaluation techniques. To plan and manage projects at each stage of the software development life cycle (SDLC). To deliver successful software projects that support organizations strategic goals										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	To understand the Software Project Planning and Evaluation techniques.	L1, L2
2.	To plan and manage projects at each stage of the software development life cycle	L1, L2, L3

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT – I** **Software Development Organization and Roles:** • The Management Spectrum; Organizational Structure; Types of Organizational Structures – Hierarchical Organizational Structure, Flat Organizational Structure, Matrix Organizational Structure, Networked Organizational Structure, T-form Organization; Job Roles in Software Development. **Overview of Project Management: Project Management** –		**L1 , L2, L3**

	• Definitions; Factors Influencing Project Management – Project Manager, Project Management Activities, Stakeholders; Project Communication; Project Development Phases; Project Charter; Statement of Work (SoW); Project Management Associations. **Project Planning: Tasks in Project Planning:** • Work Breakdown Structures (WBS); Planning Methods; Development Life Cycle Models; A Generic Project Model.		
B	UNIT - II **Estimation and Budgeting of Projects:** • Software Cost Estimation; COCOMO Model; Budgeting. **Project Scheduling:** • Scheduling Techniques – Program Evaluation and Review Technique (PERT), Gantt Chart, Critical Path Method (CPM), Automated Tools. **Project Monitoring and Controlling:** • Project Status Reporting; Project Metrics; Earned Value Analysis (EVA); Project Communication Plan & Techniques; Steps for Process Improvement.		**L1, L2, L3, L4, L5**
C	UNIT-III **Risk Management:** • Concepts of Risks and Risk Management; Risk Management Activities; Effective Risk Management; Risk Categories; Aids for Risk Identification; Potential Risk Treatments; Risk Components and Drivers; Risk Prioritization. **Configuration Management: Software:** • Configuration Management (SCM) – Baselines, Software Configuration Items (SCI); SCM Process; **Software Re-Engineering:** • Software Maintenance Problems; Redevelopment vs. Reengineering; Business Process Reengineering; Software Reengineering Process Model; Technical Problems of Reengineering. **Project Closure**: • Project Closure Analysis; Case Study		**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Software Project Management	Bob Hughes, Mike Cotterell, Rajib Mall	TMH	6th
2.	Project Management and Tools & Technologies – An overview	Shailesh Mehta	SPD	1st
3	Software Project Management	Walker Royce	Pearson	

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Project**
☐ **Test**	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-302	Python Programming Language	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Programming Concepts										
Course Objective:	Describe the core syntax and semantics of Python programming language.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	To learn basics of Python & develop console application	L1, L2
2.	To illustrate the process of structuring the data using lists, dictionaries, tuples and sets.	L1, L2, L3

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT - I** **Basics of python** • Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments, Reading Input, Print Output, Type Conversions, The type() Function and Is Operator, Dynamic and Strongly Typed Language. **Control Flow Statements** • The if Decision Control Flow Statement, The if…else Decision Control Flow Statement, The if…elif…else Decision Control Statement, Nested if Statement, The while Loop, The for Loop, The		**L1 , L2, L3**

	continue and break Statements, Catching Exceptions Using try and except Statement, **Functions** • Built-In Functions, Commonly Used Modules, Function Definition and Calling the Function, The return Statement and void Function, Scope and Lifetime of Variables, Default Parameters, Keyword Arguments, *args and **kwargs, Command Line Arguments.		
B	**UNIT - II** **Strings** • Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings, Lists, Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, The del Statement. **Dictionaries** • Creating Dictionary, Accessing and Modifying key:value Pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary Methods, The del Statement. **Tuples and Sets** • Creating Tuples, Basic Tuple Operations, Indexing and Slicing in Tuples, Built-In Functions Used on Tuples, Relation between Tuples and Lists, Relation between Tuples and Dictionaries, Tuple Methods, Using zip() Function, Sets, Set Methods, Traversing of Sets, Frozenset.		**L1, L2, L3, L4, L5**
C	**UNIT-III** **Files** • Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, The Pickle Module, Reading and Writing CSV Files, Python os and os.path Modules, Regular Expression Operations, Using Special Characters, Regular Expression Methods,		**L1, L2, L3, L4, L5**

	Named Groups in Python Regular Expressions, Regular Expression with glob Module. **Object-Oriented Programming** • Classes and Objects, Creating Classes in Python, Creating Objects in Python, The Constructor Method, Classes with Multiple Objects, Class Attributes versus Data Attributes, Encapsulation, Inheritance, The Polymorphism.		

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	"Introduction to Python Programming"	Gowrishankar S, Veena A,	CRC Press/Taylor	1st Edition
2.	Core Python Programming	Chun, J Wesley	Pearson	2nd Edition
3	Learning Python	Lutz, Mark	O Rielly	4th Edition
4.	Head First Python	Barry, Paul	O Rielly	2nd Edition

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Project**
☐ **Test**	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-303	C++ Programming Language	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE-End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Knowledge of C Programming Language										
Course Objective:	1) Student can able to implement the applications can develop the Programs with classes and objects. 2) Developing in C++ the application is more optimized and efficient than C.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Demonstrate adeptness of object oriented programming in developing solutions to problems demonstrating usage of data abstraction, encapsulation, and inheritance.	L1, L2
2.	Perform object oriented programming to develop solutions to problems demonstrating usage of control structures, modularity, I/O. and other standard language constructs	L1, L2, L3

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT – I** **Principles of Object oriented Programming** • Object oriented concepts; Features, advantages and Applications of OOPS **Introduction to C++ Programming Language** • Tokens, Expressions, Control structures, Data types, new operators and keywords, using namespace concept, Simple C++ Program,		**L1 , L2, L3**

	• Introduction to Reference variables, pointer, Classes and Objects, Access specifiers, Defining Data members and Member functions, Array of objects		
B	**UNIT – II** **Functions in C++** • Call by reference, Return by reference, Function overloading and default arguments; Inline function; Static class members; Friend Concept – Function, Class **Constructors and destructor Constructor**: • Types of constructors; Memory allocation (new and delete); Destructor		**L1, L2, L3, L4, L5**
C	**UNIT-III** **Operator overloading Overloading function**: • Overloading Unary and Binary operators, Overloading using friend function, Type casting and Type conversion **Inheritance** • Types of inheritance with examples, Virtual base classes, Virtual functions and Pure virtual function; Abstract base classes **Managing Input and Output using C++**: • Managing console I/O; C++ stream classes; Formatted and unformatted console I/O; Usage of manipulators		**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Object Oriented programming with C++	.Balaguruswamy	Tata Mc-Graw Hill Publication.	4th Edition
2.	The C++ Programming Language	Bjarne Stroustrup	Addison Wesley, 2000	
3	Object oriented programming in C++	Robert Lafore	Galgotia Publication	

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ Ask Question	☐ Presentation	☐ Brainstorming
☐ Show Video	☐ Interactive Lecture	☐ Case-Study
☐ Learning Activities	☐ Think-pair-share	☐ Project Based Learning
☐ Scenario	☐ Demonstration	☐ Group Discussion
☐ Share a Problem	☐ Fish Bowl	☐ Flipped Classroom

Course Assessment and Grading Tools:

☐ Quiz	☐ Rubric
☐ Assignment	☐ Checklist
☐ Review of research paper	☐ Marks
☐ Presentation	☐ Project
☐ Test	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-304	SQL & Oracle	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE-End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Previous experience with at least one programming language and database knowledge.										
Course Objective:	1. Enhance the knowledge and understanding of Database analysis and design 2. Preparation of background materials and documentation needed for Technical										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	• Students learn programming, management, and security issues of working with PL/SQL program units.	L1, L2
2.	• Programming topics will include the built-in packages that come with Oracle. • the creation of triggers, and stored procedure features.	L1, L2, L3

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT – I** **Introduction and Basic Concepts:-** ➢ Structure of DBMS, ➢ Advantages and Disadvantages of DBMS, ➢ Introduction Database, ➢ Understanding DBMS vs RDBMS, ➢ SQL Standards, ➢ Sub languages of SQL, ➢ Installation, ➢ SQL*Plus and use of developer tool, ➢ Datatypes in Oracle, ➢ Operators in Oracle		**L1 , L2, L3**

B	**UNIT – II** **SQL Statements & Working With Tables:-** ➢ What is SQL? ➢ Types of SQL Commands, (DDL,DML,DQL) ➢ Transaction Control Commands, ➢ Data types in SQL, ➢ Creating Tables Selecting from tables, WHERE Clause ,Selecting from tables, DISTINCT Clause, Column,Aliasing ➢ Manipulation Table data,Altering Table structure, ➢ Data Constraints: Unique, Not Null, Primary,Key, Foreign Key, Check, Default Constraint		**L1, L2, L3, L4, L5**
C	**UNIT-III** **Operators & SQL Functions& Views** ➢ Arithmetic Operators, Relational Operators ➢ LOGICAL Operators: AND OR NOT , ➢ SQL Functions: Single, Multiple Row Function, Single Row Character , Single Row Number, Single Row Date **Sorting & Grouping Data and Joining Tables** ➢ What is Sorting? ➢ ORDER BY & ORDER BY DESC Clauses, ➢ GROUP BY & GROUP BY HAVING Clauses, ➢ **Join:** Join Styles: Theta , Using clause, Types of Joins: Equi Joins, Non Equi Join, Outer **Database Triggers** ➢ What are Triggers? ➢ Triggers Syntax , ➢ Types of triggers Row Level Statement Level, Before , ➢ After Instead of Triggers, ➢ Enabling and Disabling Triggers ➢ Replacing and Dropping Triggers		**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	An Introduction to Database Systems	Bipin C Desai Revised Edition	Galgotia Publication	
2.	Oracle Database 10g PL/SQL Programming	Scott Urman , Ron Hardman, MichaleMc Laughlin,	Oracle Press, TMH	
3	Oracle Database 10g The Complete Reference	By Kevin Loney, Bob Bryla Oracle Press	TATA McGraw Hill Edition	
4.	SQL, PL/SQL the programming language of ORACLE	Ivan Bayross		4th

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Project**
☐ **Test**	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT305	HTML5 AND CSS	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Basic knowledge about the Text editor and scripting.										
Course Objective:	Understand and create the Web-Page Designing.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Learn front end and back end web development technologies in a collaborative setting.	L1, L2
2.	Learn techniques of responsive web design, including media queries	L1, L2, L3

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT – I** **HTML5 Introduction** ➢ Limitations of HTML 4 ➢ Introduction and Advantages of HTML 5 ➢ First HTML5 Document ➢ Overview of New Features of HTML5 ➢ List of HTML 4.01 elements removed from HTML5: ➢ Header, Footer, Navigation.		**L1 , L2, L3**
B	**UNIT – II** : **HTML5 Web Forms** ➢ HTML5 Global Attributes , Displaying a Search Input Field, Contact Information Input Fields, Utilizing Date and Time Input Fields, Number		**L1, L2, L3, L4, L5**

	Inputs, Selecting from a Range of Numbers, Selecting Colors , Creating an Editable Drop-Down, Requiring a Form Field, Autofocusing a Form Field, Displaying Placeholder Text, Disabling Autocomplete, Restricting Values		
C	**UNIT-III** : **INTRODUCING CSS3** ➢ What CSS3 Is and How It Came to Be, A Brief History of CSS3, CSS3 Is Modular, Module Status and the Recommendation Process, CSS3 Is Not HTML5, Let's Get Started: Introducing the Syntax, Browser-Specific Prefixes ,Future-Proofing Experimental CSS , Getting Started.		**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	HTML5 and CSS3	ELIZABETH CASTRO,BRUCE HYPLOS		7th edition
2.	Programming in HTML5 with JavaScript and CSS3	Glenn Johnson		

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Project**
☐ **Test**	

Course code	**Course Title**		**Evaluation Scheme**	**Credit**

		Teaching Scheme			Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-306	Networking Fundamental	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE-End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Basic Knowledge of computer Network, operating System, Internet etc.										
Course Objective:	• To build an understanding of the fundamental concepts of computer networking. • To learn and understand Network Performance parameters. • To Analyze Modern networks.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	• To build an understanding of the fundamental concepts of computer networking.	L1,L2,
2.	• To Analyze Modern networks.	L3,L4,L5
	• Learn the Network Topology.	

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT - I** **Introduction to Computer Networks** ➢ Computer network, Characteristic & advantages of networking, types of network, LAN, MAN, WAN. **Network topology**: ➢ Bus, star, ring, tree, mesh & hybrid topology. Advantages, disadvantages of each.	15	L1 , L2, L3

	Transmission media & Network Topologies: ➢ Guided & Unguided media, Twisted pair, coaxial cable, Fiber optics, Radio. VHF and microwaves, Satellite link.		
B	**UNIT – II** **Introduction to Network Hardware Components:** ➢ Network Connectivity Devices, Repeater, Hub, Bridges, Switch, Routers. **OSI Reference Model:** ➢ The OSI reference Model, The Physical Layer, The Data Link Layer, The Network Layer, The Transport Layer, The Session Layer, Presentation Layer, Application Layer. **The TCP/IP Reference Model**: ➢ Comparison of the OSI and TCP/IP Reference Model, Critique of the OSI Model and Protocol, A Critique of the TCP/IP Reference Model.	**15**	**L1, L2, L3, L4, L5**
C	**UNIT-III** **Network Protocols:** ➢ Data link protocols, Ethernet and token rings, X.25. **Transport protocols** ➢ Transport services, protocol mechanism, network services, TCP /IP protocol, architecture, operations and applications, **Internet and e-mail protocols:** ➢ SMTP, SLIP, POP, PPP, FTP, HTTP.	**15**	**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Computer Networks	Tanenbaum A.	PHI	4th Edition
2.	Data Communications and Networking	Fourauzan B.	TataMcGraw-HillPublications	3rd edition
3	An Engineering Approach to Computer Networking	Keshav S.	PearsonEducation	
4	High Performance TCP/IP: Networking Concepts, Issues, and Solutions,	Mahbub Hassan and Raj Jain	IST Edition, 2009	
5	TCP/IP Illustrated	W. Richard Stevens, Addison-Wesley		Volume I, Volume II and Volume III

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Project**
☐ **Test**	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-307	Quantitative & Qualitative Aptitude	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Basic Knowledge of mathematics & reasoning										
Course Objective:	• Prepare the students for the Aptitude crack for the Information technology.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Students will enhance in terms of their skills, knowledge, ability and personality.	L1,L2,
2.	Learn he basic concepts of aptitude like numerical computation ability, analytical abilities Learn Amazing Formulas and solve Quantitative Aptitude Questions for Placement	L3,L4,L5

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT - I** **Data Interpretation:** ➢ graphs (line, area) ➢ Interpretation and analysis of data based on text ➢ Charts (Column, bar, pie) ➢ tables ➢ paragraph ➢ venn diagram,	15	L1 , L2, L3

B	**UNIT – II** **Logical Reasoning:** ➢ Direction sense ➢ clocks & calendars ➢ puzzles ➢ binary logic ➢ seating arrangement ➢ coding- decoding ➢ blood relations ➢ logical sequence	**15**	**L1, L2, L3, L4, L5**
C	**UNIT-III** **Quantitative Ability** ➢ number system ➢ interest ➢ quadratic & linear equations ➢ probability ➢ trigonometry ➢ time & work ➢ percentages ➢ profit & loss ➢ algebra ➢ LCM & HCF ➢ averages ➢ permutation ➢ ratio & proportions	**15**	**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Quantitative Aptitude	R.S. Aggarwal		
2.	Quantitative Aptitude for Competitive Examinations	R.S Agrawal, S. Chand,		
3	A Modern Approach to Logical Reasoning	R.S. Aggarwal		

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ Ask Question	☐ Presentation	☐ Brainstorming
☐ Show Video	☐ Interactive Lecture	☐ Case-Study
☐ Learning Activities	☐ Think-pair-share	☐ Project Based Learning
☐ Scenario	☐ Demonstration	☐ Group Discussion
☐ Share a Problem	☐ Fish Bowl	☐ Flipped Classroom

Course Assessment and Grading Tools:

☐ Quiz	☐ Rubric
☐ Assignment	☐ Checklist
☐ Review of research paper	☐ Marks
☐ Presentation	☐ Project
☐ Test	

Semester: Fourth

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-401	Software Testing	3	1	-	10	20	10	60	-	100	4
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE-End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Knowledge to evaluate the program.										
Course Objective:	The student should be made to Expose the criteria for test cases, Learn the design of test cases. Be familiar with test management and test automation techniques. Be exposed to test metrics and measurements										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Develop to work more collaboratively, efficiently and provide more values.	L1, L2
2.	Understand the testing and importance of it in SDLC	L1, L2, L3

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT – I** **Introduction to Software Testing** • Definition of Software Testing, Need for software Testing, various approaches to Software Testing, defect distribution, Software Testing Fundamentals. General characteristics of testing, seven principles of testing. **Software testing strategies** • Testing strategies in software testing, basic concept of verification and validation, criteria for completion of testing and debugging process.		**L1 , L2, L3**

	Software development life cycle and testing • Water fall model, V-model, Spiral model, agile model, Life cycle testing concepts, testing methods, testing levels.		
B	**UNIT - II** **Static Testing and dynamic testing** • Static Testing, static analysis tools, dynamic testing, White box testing, block box testing, Regression testing, dynamic testing tools. **Functional testing** • Functional testing concepts, Equivalence class partitioning, Boundary value analysis, Decision tables, Random testing, Error guessing. **Test management** • Test planning, cost-benefit analysis of testing, Test organization, Test strategies, Test progress monitoring and control- test reporting, test control, Specialized testing.		**L1, L2, L3, L4, L5**
C	**UNIT-III** **Object-Oriented testing** • Object-Oriented testing challenges, Unit testing for Object-Oriented programming, Integration testing (top-down, bottom-up), cluster testing. **Software quality and software quality assurance** • Introduction to software quality and software quality assurance, basic principles about the software quality and software quality assurance. Planning for SQA. **Software Testing Report and Case Study** • Access Project Management Development Estimate and status, Requirement Phase Testing, Design Phase Testing program Phase Testing, Execute Test and record results, Acceptance Test Report Test results		**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Software Testing – Principles and Practices,	Srinivasan Desikan and Gopalaswamy Ramesh	Pearson Education,	Third Edition
2.	Software Testing	Ron Patton	Sams Publishing, Pearson Education	Second Edition

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Project**
☐ **Test**	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-403	Java Programming	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Knowledge of C Programming language										
Course Objective:	To learn object oriented programming using Java.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Understand Basic of how the Java programs can be created.	L1, L2
2.	Apply logic and create programs in Java.	L1, L2, L3

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT - I** **An Introduction to Java** ➢ A Short History of Java ➢ Features or buzzwords of Java ➢ Comparison of Java and C++ ➢ Java Environment ➢ Simple java program ➢ Java Tools – jdb, javap, javadoc ➢ Java IDE – Eclipse/NetBeans **An Overview of Java** ➢ Types of Comments ➢ Data Types ➢ Final Variable ➢ Declaring 1D, 2D array ➢ Accepting input using Command line argument ➢ Accepting input from console (Using BufferedReader class)		**L1 , L2, L3**

B	**UNIT - II** **Objects and Classes** ➢ Defining Your Own Classes ➢ Access Specifiers (public, protected, private, default) ➢ Array of Objects ➢ Constructor, Overloading Constructors and use of 'this' Keyword ➢ static block, static Fields and methods ➢ Predefined class – Object class methods (equals(), toString(), hashcode(), getClass()) ➢ Inner class ➢ Creating, Accessing and using Packages ➢ Creating jar file and manifest file ➢ Wrapper Classes ➢ Garbage Collection (finalize() Method) ➢ Date and time processing **Inheritance and Interface** ➢ Inheritance Basics (extends Keyword) and Types of Inheritance ➢ Superclass, Subclass and use of Super Keyword ➢ Method Overriding and runtime polymorphism ➢ Use of final keyword related to method and class ➢ Use of abstract class and abstract methods ➢ Defining and Implementing Interfaces ➢ Runtime polymorphism using interface		**L1, L2, L3, L4, L5**
C	**UNIT-III** **Exception Handling** ➢ Dealing Errors ➢ Exception class, Checked and Unchecked exception ➢ Catching exception and exception handling ➢ Creating user defined exception **Strings, Streams and Files** ➢ String class and StringBuffer Class ➢ Formatting string data using format() method ➢ Using the File class ➢ Stream classes : Byte Stream classes ➢ Character Stream Classes ➢ Creation of files ➢ Reading/Writing characters and bytes ➢ Handling primitive data types ➢ Random Access files		**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Complete reference Java	Herbert Schildt		5th edition
2.	Programming with Java, A primer	E. Balagurusamy		4th edition

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Project**
☐ **Test**	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-404	Data Warehousing And Data Mining	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Database Knowledge, Optimization, Probability and Statistics, Programming										
Course Objective:	1 To introduce the concept of data Mining as an important tool for enterprise data management and as a cutting edge technology for building competitive advantage. 2. To enable students to effectively identify sources of data and process it for data mining. 3. To make students well versed in all data mining algorithms, methods, and tools.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Design the database architecture for storing large data.	L1, L2
2.	Understand and implement various algorithms used for data mining	L1, L2, L3
3.	Analyze the data using existing data mining tools	
4.	Able to prepare the data needed for data mining algorithms in terms of attributes and class inputs, training, validating, and testing files.	

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT - I** **Introduction Data Warehouse Architecture and Infrastructure**: ➢ Data Warehouse Architecture, Infrastructure and Metadata Management, **Extract Transform Load Cycle:** ➢ ETL overview, Extraction, Loading, Transformation techniques.		**L1 , L2, L3**

	Basic Data Mining task, Data Mining Vs Knowledge discovery in databases, Social Implication of Data Mining, Related Concepts and Data Mining Techniques, Database/OLTP systems, Information Retrieval, Major issues in Data Mining,		
B	**UNIT – II** **Information Access and Delivery** ➢ Matching information to classes of users OLTP and OLAP System, OLAP – the need, Design of the OLAP database, OLAP operations: slice, dice, rollup, drill-down etc. OLAP implementations. Data Mart, Type of Data Mart, OLAP Tools and The Internet.		**L1, L2, L3, L4, L5**
C	**UNIT-III** **Introduction to Data Mining** ➢ Data Mining; Introduction, From Data Warehousing to Data Mining, Steps of Data Mining, Data Mining algorithm, Database segmentation, Predictive modeling, link Analysis, tools for Data Mining., Developing a Data Warehouse, Building a Data Warehouse, Design considerations, Data Content, Metadata, Distribution of data **Tools, Application, Case Study of Data Mining.** ➢ Tools, Application, Tools For Data Warehousing, Performance Considerations, Crucial Decisions In Designing A Data Warehouse, Various Technology Considerations, Application of Data Warehousing and Data Mining, Areas For Data Warehousing and Data Mining With Case Studies.		**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Data Mining Introductory and Advanced Topics	Margaret H.Dunham and S.Sridhar	Pearson Education	
2.	Data Warehousing Fundamentals, 2009, ISBN 978-81-265-0919-5	Paulraj Ponniah,	Wiley India Publication	
3	Data mining concepts and techniques	Jiawei Han and Micheline Kamber		
4.	Data Mining Data Warehousing-	Nilesh magar	Vision Publication	
5.	Data Mining Techniques	Dr. Arun K. Pujari	Universal Press	
6.	Principles of Data Mining	Bramer	Springer	
7.	Data Warehousing	C.S.R. Prabhu	PHI Publication	
8.	Web Warehousing and Knowledge Management	Mattision	TMH	

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Project**
☐ **Test**	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-405	JAVASCRIPT	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Must know about the HTML and Web-page designing.										
Course Objective:	Understand the dynamic of web-page & create it using the JavaScript. Understand the client side validation and scripting.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Understand the dynamic web-page designing	L1, L2
2.	Learn & Create the complete web-site	L1, L2, L3

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT – I JavaScript Introduction** ➢ JavaScript Introduction ➢ Variable declaration ➢ Operators ➢ Control Statements ➢ Error Handling ➢ Understanding arrays ➢ Function Declaration		**L1 , L2, L3**
B	**UNIT – II : Built In Functions** ➢ Built In Functions ➢ Standard Date and Time Functions ➢ HTML Document object Model ➢ Working with HTML form and its elements ➢ Other Document Object Model		**L1, L2, L3, L4, L5**

C	**UNIT-III : Working with Objects and Classes** ➢ Working with Objects ➢ Call method in JavaScript ➢ Inheritance in JavaScript using prototype ➢ Working with cookies		**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	A Beginner's Guide JavaScript	John Pollock	McGraw Hill	3rd edition
2.	Beginning JavaScript	Paul Wilton	Weily Publisher	

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Project**
☐ **Test**	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-406	Network Securities	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE-End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	The fundamental concepts and terminology of computer networking.										
Course Objective:	1. To understand Cryptography Theories, Algorithms and Systems. 2. To introduce advanced networking and network security concepts.										

Course Outcome: After completion of the course the student will be able to:

Sr. No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	To understand Cryptography Theories, Algorithms and Systems.	L1,L2
2.	To understand necessary Approaches and Techniques to build protection mechanisms in order to secure computer networks.	L3,L4
3.	To introduce advanced networking and network security concepts.	L5

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT 1** **Foundations of Network Security:** ➢ Introduction to the Concepts of Security: The need for security, Security Approaches, Principles of Security. ➢ Network Security Terminologies, Network Security and Data Availability, Threats and Risks.		L1 , L2, L3

	Attacks – ➢ Passive and Active, Security Services, Confidentiality, Authentication, Non-Repudiation, Integrity, Access Control, Availability, Model for Internetwork Security, Internet Standards and RFCs Access Control Mechanisms ,Access Matrix, HRU, TAM, ACL and capabilities.		
B	**UNIT - II** **Classical Encryption Technique:** ➢ Introduction to Cryptographic Techniques: Plain Text and Cipher Text. ➢ Substitution Techniques, Caesar cipher, monoalphabetic cipher, Playfair cipher, ➢ Transposition Techniques, Encryption and Decryption, Introduction to Symmetric and Asymmetric Key Cryptography, Steganography, Key Range and Key Size, Possible Types of Attacks.	**15**	**L1, L2, L3, L4, L5**
C	**UNIT-III** **Symmetric Key Cryptographic:** ➢ Computer-based Symmetric Key Cryptographic Algorithms: Algorithm Types and Modes, An overview of Symmetric Key Cryptography, Block Cipher, Fiestel Cipher, DES, Triple DES, International Data Encryption Algorithm (IDEA), RC5, Blowfish, AES, Differential and Linear Cryptanalysis. **Computer-based Asymmetric Key Cryptography:** ➢ Brief History of Asymmetric Key Cryptography, An overview of Asymmetric Key Cryptography, The RSA Algorithm, Symmetric and Asymmetric Key Cryptography Together, Digital Signatures, Knapsack Algorithm, Some other Algorithms.	**15**	**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Network Security Essentials	William Stallings	Prentice-Hall.	
2.	Fundamentals of Computer Security Technology	Edward Amoroso	Prentice-Hall.	
3	Cryptography: Theory and Practice	Douglas R. Stinson	CRC Press	

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Project**
☐ **Test**	

Semester: Fifth

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-501	Internet of Things	3	1	-	10	20	10	60	-	100	4
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE-End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Fundamentals of computer, communication & internet Technology, web technology, information security.										
Course Objective:	In this course, student will explore various components of Internet of things such as Sensors, internetworking. In the end they will understand the IoT Technology.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Understand the vision of IoT from a global context.	**L1**
2.	Understand the application of IoT.	**L2**
3.	Building state of the art architecture in IoT.	**L3**
4.	To provide new means to understand the existing and emerging. Threats that are targeting the IoT based economy.	**L4**

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT – 1** **Introduction of Internet of Things** ➢ IoT Definition, Characteristics, IoT Functional Blocks, ➢ Physical design of IoT, Logical Design of IOT, ➢ IOT Enabling Technologies, ➢ IOT Levels & Deployment Templates **Domain Specific IOT** ➢ Introduction, Home Automation, Cities, Environment, Energy, Retail, Logistics, Agriculture, industry, Health & lifestyle.	15	L1,L2
B	**UNIT 2** **IOT and M2M** ➢ Introduction, M2M, Difference Between IoT and M2M, SDN and NFV for IoT. **IoT System Management with NETCONF-YANG** ➢ Need for IoT Systems Management, Simple Network Management Protocol (SNMP), Limitation of SNMP, Network operator requirements, NETCONF, YANG, IoT Systems Management with Netconf-yang,	15	L2,L3
C	**UNIT 3** **Iot Platform Design Methodology** ➢ Introduction, IoT Design Methodology, case Study on IoT System for Weather Monitoring, Motivation for using Python. **IoT System- Logical Design using Python** ➢ Introduction, Installing Python, python Data types & Data Structures, Control Flow, Functions, Modules, Packages, file handling data/time operation, classes, Python Packages of interest for IoT.	15	L1,L4

Books and References:

Sr.No.	Title	Author	Publishers	Edition
1.	Internet of Things (A Hands-on-Approach) **(Core Book)**	Vijay Madisetti , Arshdeep Bahga	VPT	First Edition 2014
2.	Rethinking the Internet of Things: A Scalable Approach to Connecting Everything	Francis Dacosta	Apress Publications	First Edition 2013
3.	From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence	Jan Holler, Vlasios Tsiatsis	Apress Publications	First Edition 2014
4.	Internet of Things (IoT) Technologies, Application, Challenges, and Solution,	Edited By B.K. Tripathy & J. Anuradha	CRC Press	2018

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Project**
☐ **Test**	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-502	Artificial Intelligence	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE-End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Basic knowledge of algorithms & data structures										
Course Objective:	• Understand basic principles, techniques, and applications of Artificial Intelligence. • Problem solving, inference, perception, knowledge representation, and learning.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Understand the elementary statistical methods.	L1, L2
2.	Apply the measures of central tendency, measure of dispersion and co-relation to solve our day-today life problem.	L1, L2, L3

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT – I** **Definitions:** ➢ Artificial Intelligence, Intelligence, Intelligent behaviour, Understanding AI, Hard or Strong AI, Soft or Weak AI, Cognitive Science. **Goals of AI:** ➢ General AI Goal, Engineering based AI Goal, Science-based AI Goal.		**L1 , L2, L3**
B	**UNIT – II** **AI Approaches**: ➢ Cognitive science, Laws of thought, Turing Test, Rational agent.		**L1, L2, L3, L4, L5**

	AI Techniques: ➢ Techniques that make system to behave as Intelligent, Describe and match, Goal reduction, Constraint satisfaction, Tree Searching, Generate and test, Rule based systems, Biology-inspired AI techniques Neural Networks, Genetic Algorithms, Reinforcement learning. **Search and Planning** : ➢ Problem spaces and search, Heuristic search strategies, Search and optimization (gradient descent), Adversarial search, Planning and scheduling, Case study: Health Care System		
C	**UNIT-III** **Knowledge Representation and Reasoning:** ➢ Knowledge and Knowledge based system, Knowledge and rationality, Logic and inference, Ontologies, Bayesian Reasoning, Temporal reasoning, Knowledge Discovery: Data and Web Mining Case study: **Medical diagnosis Branches of AI** : ➢ Logical AI, Search in AI, Pattern Recognition, Knowledge Representation, Inference, Commonsense knowledge and reasoning, Learning, Planning, Epistemology, Ontology, Heuristics, Genetic programming. **Applications of AI:** ➢ Game playing, Speech Recognition, Understanding Natural Language, Computer Vision, Expert Systems.		**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1	Artificial Intelligence'	R B Mishra		
2	Knowledge and Knowledge based system'	Russell		
3	Introduction to Artificial Intelligence	CHARNIAK, PEARSON		
4	Artificial Intelligence, Stuard Russell & Peter Norvig,	Prentice Hall		

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-503	Android	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Basic of Java and XML / HTML										
Course Objective:	Develop the Android Application for mobile.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Understand the elementary Layout and UI control required for the Apps development in android.	L1, L2
2.	Create and configure the UI controls with the Event Handling.	L1, L2, L3

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT - I** **Basic Java & XML Topics for Android** ➢ Class, Object, Variables ➢ Inheritance ➢ Interaface ➢ Casting ➢ Collection Classes ➢ Generic Classes ➢ Android Related Topics ➢ XML Basics **Android Studio Setup**		**L1 , L2, L3**

	➢ Android Studio Installation ➢ Android Architectures ➢ Application Components ➢ Gradle File ➢ Hello World Example ➢ Project File Structure **Android UI** ➢ UI Layout basic ➢ Different types of layouts ➢ Linear Layout ➢ Relative Layout ➢ Layout Attributes ➢ Table Layout		
B	**UNIT - II** **UI Controls and Attributes** ➢ TextView ➢ EditText ➢ Button ➢ CheckBox ➢ RadioButton ➢ ImageView **Style and Themes** ➢ Defining Styles ➢ Using Styles in layout ➢ Style Inheritance ➢ Android Themes ➢ Default Style and Themes		**L1, L2, L3, L4, L5**
C	**UNIT-III** **Event Handling** ➢ Event listeners and handlers ➢ Event listeners and registration **Intents and Different Screens** ➢ Intent Objects ➢ Android Intent Standard Action ➢ Types of Intent ➢ Passing Data with Intent		**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Professional Andriod 4 Application Development	Retomeier,	Wrox publication	
2.	Andriod Apps for Absolute beginners	Wallace Jadson	Apress.	
3	The Complete Andriod Guide:	Kevin Purdy		

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Project**
☐ **Test**	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-504	Introduction to Data Science	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Good mathematical background and programming skills sufficient enough to learn new languages and software are required. Basic knowledge of statistics.										
Course Objective:	Conceptual nature of data science										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	To develop fundamental knowledge of concepts underlying data science	**L1,L2**
2.	To develop practical data analysis skills, which can be applied to practical problems	**L3,L4**
3.	To explain how math and information sciences can contribute to building better algorithms and software	**L3,L4**
4.	To develop applied experience with data science software, programming, applications and processes	**L4,L5**

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT – I** **Introduction to Data Science Concepts:** ➢ Causality and Experiments, Data Preprocessing: Data cleaning, Data reduction, Data transformation, Data discretization.		**L1 , L2, L3**

	Visualization and Graphing: ➢ Visualizing Categorical Distributions, Visualizing Numerical Distributions, Overlaid Graphs, plots, and summary statistics of exploratory data analysis, Randomness, Probability, Introduction to Statistics, Sampling, Sample Means and Sample Sizes.		
B	**UNIT - II** **Data Science Technology Stack:** ➢ Rapid Information Factory Ecosystem, Data Science Storage Tools, Data Lake, Data Vault, Data Warehouse Bus Matrix, Data Science Processing Tools ,Spark, Mesos, Akka , Cassandra, Kafka, Elastic Search, R ,Scala, Python, MQTT, The Future Layered Framework: Definition of Data Science Framework, CrossIndustry Standard Process for Data Mining (CRISP-DM), Homogeneous Ontology for Recursive Uniform Schema, The Top Layers of a Layered Framework, Layered Framework for High-Level Data Science and Engineering Business Layer: Business Layer, Engineering a Practical Business Layer Utility **Three Management Layers**: ➢ Operational Management Layer, Processing-Stream Definition and Management, Audit, Balance, and Control Layer, Balance, Control, Yoke Solution, Cause-and-Effect, Analysis System, Functional Layer, Data Science Process		**L1, L2, L3, L4, L5**
C	**UNIT-III** **Retrieve Superstep :** ➢ Data Lakes, Data Swamps, Training the Trainer Model, Understanding the Business Dynamics of the Data Lake, Actionable Business Knowledge from Data Lakes, Engineering a Practical Retrieve Superstep, Connecting to Other Data Sources, **Assess Superstep:** ➢ Assess Superstep, Errors, Analysis of Data, Practical Actions, Engineering a Practical Assess Superstep, 12 8 IV Process Superstep : Data Vault, Time-Person-Object-Location-Event Data Vault, Data Science Process, Data Science, Transform Superstep		**L1, L2, L3, L4, L5**

	: Transform Superstep, Building a Data Warehouse, Transforming with Data Science, Hypothesis Testing, Overfitting and Underfitting, Precision-Recall, Cross-Validation Test **Organize and Report Supersteps** : ➢ Organize Superstep, Report Superstep, Graphics, Pictures, Showing the Difference		

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Computational and Inferential Thinking: The Foundations of Data Science	Adi Adhikari and John DeNero e	e-book	
2.	Practical Data Science	Andreas François Vermeulen	APress	2018
3	Principles of Data Science	Sinan Ozdemir	PACKT	2016
4.	Data Science from Scratch	Joel Grus	O'Reilly	2015
5.	first Principle in python	Joel Grus	Shroff Publishers	2017
6.	Experimental Design in Data science with Least Resources	N C Das	Shroff Publishers	2018

Strategies to help student to gain their attentions& Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐**I nteractive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Project**
☐ **Test**	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-505	Advances in PHP	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE-End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Basic of scripting Language or any programming language										
Course Objective:	The objective of this course is to provide the necessary knowledge to design and develop dynamic, database-driven web applications using PHP										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	Understand the server side programming language.	L1, L2
2.	Create PHP programs that use various PHP library functions, and that manipulates the Web-site.	L1, L2, L3

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT – I** **Introduction to PHP**: ➢ Evaluation of Php, Basic Syntax, Defining variable and constant, Php Data type, Operator and Expression. **Decisions and loop Making Decisions**, ➢ Doing Repetitive task with looping, Mixing Decisions and looping with Html. **Function** : ➢ What is a function, Define a function, Call by value and Call by reference, Recursive function, String Creating and accessing, String Searching & Replacing String, Formatting String, String Related Library function		**L1 , L2, L3**

B	**UNIT - II** **Array** : ➢ Anatomy of an Array, Creating index based and Associative array Accessing array, Element Looping with Index based array, Looping with associative array using each () and foreach(), Some useful Library function. **Handling Html Form with Php** : ➢ Capturing Form, Data Dealing with Multi-value filed, and Generating File uploaded form, redirecting a form after submission **Working with file and** : ➢ Directories Understanding file& directory, Opening and closing, a file, Coping, renaming and deleting a file, working with directories, Creating and deleting folder, File Uploading & Downloading		**L1, L2, L3, L4, L5**
C	**UNIT-III** **Session and Cookie** : ➢ Introduction to Session Control, Session Functionality What is a Cookie, Setting Cookies with PHP. Using Cookies with Sessions, Deleting Cookies, Registering Session variables, Destroying the variables and Session. **Database Connectivity with MySql**: ➢ Introduction to RDBMS, Connection with MySql Database, Performing basic database operation(DML) (Insert, Delete, Update, Select), Setting query parameter, Executing queryJoin (Cross joins, Inner joins, Outer Joins, Self joins.) **Exception Handling Understanding**: ➢ Exception and error, Try, catch, throw. Error tracking and debugging		**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Learning PHP and MySQL	Michele E. Davis, Jon A. Phillips		
3	Beginning PHP and MySQL	W Jason Gilmore		
4.	Build Your Own Database Driven Web Site Using PHP & MySQL	Kevin Yank		

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Project**
☐ **Test**	

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITT-506	Ethics & Cyber Law	3	-	-	20	20	-	60	-	100	3
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Understanding of right and duties of citizen.										
Course Objective:	To Understand and know about ethics and Cyber Law.										

Course Outcome: After completion of the course the student will be able to:

Sr.No.	Course Outcome	Cognitive Level as per Bloom Taxonomy
1.	• To learn foundations of Cyber law and Ethics.	L1, L2
2.	• Understand the International Cyber Law & Information Technology Act-2000.	L1,L3

Detailed Syllabus:

Section	Topics to be covered	No. of Lect.	Cognitive Level of attainment as per Bloom's Taxonomy
A	**UNIT – I** **Introduction to Cyber Law** ➢ Evolution of computer technology, emergence of cyber space. ➢ Cyber Jurisprudence, Jurisprudence and law, Doctrinal approach, Consensual approach, ➢ Real Approach, ➢ Cyber Ethics, Cyber Jurisdiction, ➢ Hierarchy of courts, Civil and criminal jurisdictions, ➢ Cyberspace-Web space, ➢ Web hosting and web Development agreement, ➢ Legal and Technological Significance of domain Names, • Internet as a tool for global access.		**L1 , L2, L3**

B	**UNIT - II** **Information Technology Act** ➢ Overview of IT Act, 2000, ➢ Amendments and Limitations of IT Act, ➢ Digital Signatures, ➢ Cryptographic Algorithm, Public Cryptography, Private Cryptography, ➢ Electronic Governance, ➢ Legal Recognition of Electronic Records, ➢ Legal Recognition of Digital Signature, ➢ Certifying Authorities, ➢ Cyber Crime and Offences, ➢ Network Service Providers Liability, ➢ Cyber Regulations Appellate Tribunal, Penalties and Adjudication		**L1, L2, L3, L4, L5**
C	**UNIT-III** **Cyber Law and Related Legislation** ➢ Patent Law, Trademark Law, Copyright, ➢ Software – Copyright or Patented, ➢ Domain Names and Copyright disputes, ➢ Electronic Data Base and its Protection, ➢ IT Act and Civil Procedure Code, IT Act and Criminal Procedural Code, ➢ Relevant Sections of Indian Evidence Act, Relevant Sections of Bankers Book Evidence Act, Relevant Sections of Indian Penal Code, Relevant Sections of Reserve Bank of India Act, ➢ Law Relating To Employees And Internet, Alternative Dispute Resolution, ➢ Online Dispute Resolution (ODR). **Cyber Ethics** ➢ The Importance of Cyber Law, ➢ Significance of cyber Ethics, ➢ Need for Cyber regulations and Ethics. ➢ Ethics in Information society, ➢ Introduction to Artificial Intelligence ➢ Ethics: Ethical Issues in AI and core Principles, ➢ Introduction to Block chain Ethics.		**L1, L2, L3, L4, L5**

Books and References:

SR.NO.	Title	Author	Publishers	Edition
1.	Computer Security Basics (Paperback)	Debby Russell and Sr. G. T Gangemi,	O'Reilly Media, 2006.	2nd
2.	Information Security policies and procedures: A Practitioners Reference	Thomas R. Peltier	Prentice Hall, 2004.	2nd
3	Cyber Security Essentials Averbach	James Graham	T and F Group.	
4.	Cyber law: the Law of the Internet	Jonathan Rosenoer	Springer-verlag, 1997	

Strategies to help student to gain their attentions & Presenting Content of Course:

☐ **Ask Question**	☐ **Presentation**	☐ **Brainstorming**
☐ **Show Video**	☐ **Interactive Lecture**	☐ **Case-Study**
☐ **Learning Activities**	☐ **Think-pair-share**	☐ **Project Based Learning**
☐ **Scenario**	☐ **Demonstration**	☐ **Group Discussion**
☐ **Share a Problem**	☐ **Fish Bowl**	☐ **Flipped Classroom**

Course Assessment and Grading Tools:

☐ **Quiz**	☐ **Rubric**
☐ **Assignment**	☐ **Checklist**
☐ **Review of research paper**	☐ **Marks**
☐ **Presentation**	☐ **Project**
☐ **Test**	

Semester: Sixth

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITP-601	Major Project / Industrial Internship	-	-	18	-	-	200	300	-	500	18
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Database Knowledge, Optimization, Probability and Statistics, Programming										
Course Objective:	The students enrolled for the Program will have to undergo an Industrial Training/Internship in Software Industry and/or R&D Sector.										

- **Student after completing the Internship as well during the period will have to submit his / her progress in phases.**
- **PROJECT / Industrial Training:-**
  - Students of semester VI will have to perform Project at the site of Industry / User-End. Distribution of project marks will as follows.
    - Submission of Internship-Joining Letter : 50
    - Certificate for Attendance of 300 working hrs: 150
    - Review 1 Report : 50
    - Review 2 Report : 50
    - Project work (certified): 100 marks.
    - Project work Presentation: 50marks.
    - Viva/ Oral: 50 marks.

Course code	Course Title	Teaching Scheme			Evaluation Scheme						Credit
					Internal			External		Total	
		L	T	P	CA	MSE	TW	ESE	PR		
BITP-601	Seminar	4	-	-	-	-	80	120	-	200	4
L- Lecture, T-Tutorial, P-Practical, CA- Continuous Assessment, MSE- Mid Semester Examination, ESE- End Semester Examination, PR-Practical, TW-Term Work.											
Prerequisite :	Latest upcoming in the Information technology										
Course Objective:	Presentation skill development.										