

Nirma University, Ahmedabad

(Statutory University Established under the State Act and recognized by the University Grants Commission under section -2(f) of the UGC Act, 1956)



NAAC Accredited 'A' Grade

TRANSCRIPT

The statement showing the Semester and Course wise performance of the student



Name of the Institute : Institute of Technology

Programme : B. Tech. in Information Technology

Duration : 4 years (8 semesters)

Roll No.	Student's Name	Month & Year of Admission	Month & Year of Completion
14BIT005	Akshar S Modi	July - 2014	May - 2018

Course Code & Title			CG	Cr	Course Code & Title			CG	Cr		
Semester : I					CE501 Theory of Computation					B	4
MA101	Calculus		B+	4	CE502	Database Management Systems		B+	5		
PY101	Physics		A	3	IT501	Data Communication Networks		B	5		
CL102	Mechanics of Solids		B+	5	CE504	Operating Systems		B+	5		
ME101	Engineering Graphics		A	4	IT502	Web Designing		B	3		
HM131	German Language		A	3	IT503	Mini Project - II		A	1		
ME102	Mechanical Workshop Practices		A	1	SS562	Law for Engineers		A	2		
SP102	Yog and Meditation		B	-	SP501	Fractional Course		A	-		
SPI : 8.55		Credits Earned : 20			SPI : 7.64		Credits Earned : 25				
					PPI : 8.32		Progressive Credits Earned : 115				
Semester : II					Semester : VI						
MA201	Linear Algebra		A	4	IT601	Software Engineering		A	4		
CY101	Chemistry		A	3	CE601	Design and Analysis of Algorithms		B+	4		
CL101	Environment and Energy Studies		B+	3	CE661	Mobile Applications Development Technologies		B+	4		
CE101	Art of Programming		A+	5	IT662	Cloud Computing		B+	4		
EE101	Elements of Electrical Engineering		B	4	CE623	Machine Learning		B	4		
HM101	Communication Skills		A	3	IT602	Mini Project - III		A	1		
EE102	Electrical Workshop Practices		B+	1	UEIM003	Fundamentals of International Business		A+	3		
SP101	Critical Thinking		B+	-	SS561	Creativity and Innovation		B+	2		
SPI : 8.70		Credits Earned : 23			SP601	Capstone Course		B+	-		
PPI : 8.63		Progressive Credits Earned : 43			ITA01	Indian Culture		SC	-		
					SPI : 8.27		Credits Earned : 26				
Semester : III					PPI : 8.31		Progressive Credits Earned : 141				
EC321	Basic Electronics		B+	4	Semester : VII						
CE301	Digital Systems		A	5	IT701	Network Protocols		B	4		
CE302	Object Oriented Programming		B+	5	IT702	Information Retrieval Systems		B+	4		
CE303	Mathematical foundation of Computer Science		B+	4	IT7A4	Network Programming		B+	4		
MA306	Applied Mathematics		B	4	IT7D4	Agile Software Development		A	4		
SS342	ICT Tools and Security		A	1	IT704	Minor Project		B+	2		
SP343	Entrepreneurship		A	-	IT705	Open Source Development Lab		B	1		
SPI : 8.09		Credits Earned : 23			HS016	Applied Literature		B+	3		
PPI : 8.44		Progressive Credits Earned : 66			SS701	Organizational Behaviour		A	2		
Semester : IV					SP701	Practical Training		A	-		
IT401	Communication Engineering		A	4	SPI : 8.04		Credits Earned : 24				
CE402	Computer Organization		B+	5	PPI : 8.27		Progressive Credits Earned : 165				
CE403	Data Structures		B+	5	Semester : VIII						
MA403	Probability Statistics and Numerical Analysis		A+	5	IT801	Major Project		A	21		
IT402	Seminar		A	1	SPI : 9.00		Credits Earned : 21				
IT403	Mini Project - I		A	1							
CE406	Computer Peripherals Workshop		A	1							
SS341	Economics for Engineers		B+	2							
SP341	Ethics and Values		A	-							
SP344	Community Services		A	-							
SPI : 8.71		Credits Earned : 24									
PPI : 8.51		Progressive Credits Earned : 90									
Semester : V											

SC = Successfully Completed

SC = Successfully Completed

Total Credits Earned	Cumulative Performance Index (CPI)	Equivalent % Marks	Class obtained
186	8.35/ 10	78.5	First Class with Distinction

CG = Course Grade

Cr = Credit

SPI = Semester Performance Index

PPI = Progressive Performance Index

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Date : 07/07/2018



Verified by
[Amit Modh]
Office Supdt.

Deputy Registrar,
Examination

- **Medium of Instructions :** English
- **Eligibility Criteria for Admission:**

(i) Higher Secondary Certificate Examination (10+2) or recognized examinations considered equivalent by the University passed with Chemistry, Physics and Mathematics students are admitted in the first semester of the B.Tech. programme. (ii) Diploma Examination in the concerned discipline from Technical Examination Board, Gujarat State or from the Nirma University or recognized examinations considered equivalent by the Nirma University in addition to the Secondary Certificate Examination (10th) passed students are admitted in the third semester of B.Tech. programme.

THE PROVISION OF DIFFERENT RELEVANT REGULATIONS

Performance level of the student in the course

Grade (G)	Qualitative Meaning (GQ)	Equivalent Grade Point (g)	Grade (G)	Qualitative Meaning (GQ)	Equivalent Grade Point (g)
A+	Excellent	10	B	Good	7
A	Creditable	9	C+	Satisfactory	6
B+	Very Good	8	C	Average	5

PASSING STANDARDS

- Minimum passing grade for a course – ‘C’
- Minimum CPI required for passing a programme – 5.00

CALCULATION OF INDICES

PIC -- Performance index for the course = Equivalent grade point (g) corresponding to the course grade

PPI = (Up to any stage under consideration)
 $(i_1 c_1 + i_2 c_2 + i_3 c_3 \dots) / (\text{Sum of credits of all courses registered up to that stage})$,
 where, $i_1, i_2, i_3 \dots$ are PIC values of credit courses passed and $c_1, c_2, c_3 \dots$ are the credit values of the respective courses.

SPI = This index is similar to PPI except that the stage to be considered is the end of a semester.

CPI = This index refers to the entire programme. It is calculated when the student passes the programme. The method of calculation is the same as for PPI or SPI but the summation is for the courses of all semesters of the programme.

All index values will be rounded off to the second place of decimal.

CLASS AND PERCENTAGE MARKS

CPI value, its equivalent class and formula for computing the percentage of marks from the CPI obtained by the student are given below.

<u>CPI value</u>	<u>Equivalent class</u>	
5.00 To 6.49	Second	Percentage marks = $(\text{CPI} - 0.5) \times 10$
6.50 To 7.49	First	
7.50 and above	First with Distinction	

Nirma University, Ahmedabad

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Name of the Institute: Institute of Technology
Programme: B. Tech. in Information Technology

SEMESTER I

MA101 Calculus

L T P C
3 1 - 4

Successive Differentiations, McLaurin's and Taylor's Series, Partial Differentiation, Chain Rule, Total Differentiation, Applications of Partial Differentiations, Reduction Formulae, Beta and Gamma Functions, Error Function, Applications of Integration, Double Integrations, Change of Order and Variable, Applications of Double Integration, Triple Integration and Its Applications.

PY101 Physics

L T P C
2 - 2 3

Electric fields and magnetic fields, Electron Emission & Electron ballistics, Properties of Light, Interference, Diffraction and Polarization of Light, Architectural Acoustics & Ultrasonic, Atomic Physics & Lasers, The structure of Solids, Semiconductors.

CL102 Mechanics of Solids

L T P C
3 1 2 5

Force system, forces in truss, force in cable, rigid body assemblies, forces in space, centre of gravity, moment of inertia, Friction, Principle of Virtual work, Stresses, Strain, Shear force, Bending moment, Bending Stresses, Shear stress, Torsion, Principal Plane and stresses, Thin cylinder and spherical vessels under pressure, Mechanical Properties of Materials.

ME101 Engineering Graphics

L T P C
2 - 4 4

Introduction to Engineering Drawing, Engineering Curves, Solid Geometry, Developments of Surfaces by parallel line method and radial line method, Interpenetration of Solids, Orthographic Projections, Isometric Projections, Computer Aided Drafting Tools, Conventional Representation, Related Laboratory Work.

HM102: English/Foreign Language

L T P C
2 - 2 3

Elementary Language Competence, Tenses, Synonyms, Antonyms, Prepositions, Idioms, Confusables, Modal Auxiliary Verbs, Auxiliary Verbs, Poems, Prose Works.

HM111 French Language

L T P C
2 - 2 3

Basic Introduction, Alphabets and Accents, Rules for Pronunciation, Everyday Conversation Articles, Parts of Speech, Sentence Construction, Paragraph, Letter Writing, Translation, Oral Communication, Active Listening, Reading Skills of the counting.

HM131 German Language

L T P C
2 - 2 3

Basic Introduction, Alphabets and Accents, Rules for Pronunciation, Everyday Conversation Articles, Parts of Speech, Sentence Construction, Paragraph, Letter Writing, Translation, Oral Communication, Active Listening, Reading Skills of the counting.

HM121 Spanish Language

L T P C
2 - 2 3

Basic Introduction, Alphabets and Accents, Rules for Pronunciation, Everyday Conversation Articles, Parts of Speech, Sentence Construction, Paragraph, Letter Writing, Translation, Oral Communication, Active Listening, Reading Skills of the counting.

ME102 Mechanical Workshop Practices

L T P C
- - 2 1

Joining process, Plumbing (metallic and non metallic pipe fitting), Fitting /Assembly practice, Sheet Metal work, Electroplating Carpentry/ Pattern Making, Blacksmithy, Painting. Exercise and Term work of Arc Welding / Soldering, Fitting / Assembly, Carpentry Practice, Blacksmithy Practice Related Laboratory Work.

SP102 Yog and Meditation

L T P C
- - 2 -

Introduction of "YOG", Astangyog, Sukshmayog (Light exercises), Suryanamaskar, Rules for asanas (Before & after), Asanas for brain &

stomach, Asanas for relaxation and rest, Kriya (Kapalbhranti and Tratak), Bhastrika, Tribandha, Ujjayi, Pranayama (Anuloma, Viloma), Omkar (Bhramari), Importance of diet for "Total Health", Meditation for mind relaxation.

SEMESTER II

MA201 Linear Algebra L T P C 3 1 - 4

Rank and Inverse of Matrix, Solution of System of Linear Equations, Vector Space, Subspace, Basis of Vector Space, Rank Nullity Theorem, Linear Transformation, Matrix of General Linear Transformation, Change of Basis and Similarity, Eigen Values and Vectors, Diagonalization, Caley-Hamilton Theorem and Its Applications.

CY101 Chemistry L T P C 2 - 2 3

Water, Fuels, Lubricants and Greases, Polymers, Electrochemical Systems, Green Chemistry, Advances in chemistry.

CL101 Environment and Energy L T P C 3 - - 3 Studies

Introduction to environment, Environment conservation and management, public awareness. Causes, effects and control measures of pollutions, Solid Waste management. Basics of environmental management systems and environmental impact assessment. Social issues and the environment. Introduction to energy sources, issues and problems involved with the generation, storage, transport, and usage of energy. Renewable and Non-renewable energy, issues related to energy.

CE101 Art of Programming L T P C 3 1 2 5

Introduction to Computer Systems, Data Storage and Operations, Algorithms and Flow charting, Algorithm to Program, Loops and Controls Construct, Errors and Debugging: Structured Programming, Coding Conventions

EE101 Element of Electrical L T P C 3 - 2 4 Engineering

Review of DC Circuits, Electromagnetic Induction, Single-phase AC Circuits, Three-phase AC Circuits,

Domestic and Industrial Wiring, Electrical Safety and Protection, Batteries

HM101 Communication Skills L T P C 2 - 2 3

Meaning & Process of Communication, Non-Verbal Communication- Kinesics, Proxemics, Chronemics, Reading Skills for Better Comprehension, Oral Communication, Presentation Skills, Group Discussions, Written Communication, Report Writing, Letter Writing, Job Application, Listening Skills, Vocabulary Building, Grammar

EE102 Electrical Workshop L T P C - - 2 1 Practices

Wiring Techniques, Introduction to Electronic Components, Lab equipment, Introduction to Electrical Components, Soldering Techniques, Basics of Household Electrical Equipment, Basic Network Communication, Designing of Electrical Panel, Introduction to Lighting, Introduction to DC Machine

SP101 Critical Thinking L T P C - 1 - -

Introduction to Critical Thinking, Need of Critical Thinking, Types of Thinking, Cognitive Domain, Psychomotor Domain, Affective Domain, Barriers of Critical Thinking, Intellectual Standards, Elements of Thought, Intellectual Traits, Critical Thinking : A Model Of Engineering, Arguments, Types of Argument , Fallacies, Six Thinking Heads

SEMESTER-III

EC321 Basic Electronics L T P C 3 - 2 4

Semiconductor Diodes, Bipolar Junction Transistor, Small Signal Models for Transistors, Amplifiers, Operational Amplifier, Oscillators, Power supplies

CE301 Digital Systems L T P C 3 1 2 5

Binary Systems, Boolean Algebra and Logic Gates, Boolean Function Simplification, Combinational Logic, Sequential Logic, Registers, Counters, Memory Unit, Digital Integrated Circuits

CE302 Object Oriented L T P C 3 1 2 5 Programming

Introduction and Overview of Java, Data Types, Variables, Operators, Arrays, Control Statements,



Classes and Methods, String Handling, Inheritance, packages and interfaces, various packages of Java Development Kit, Exception Handling, Multithreaded Programming, Managing I/O, Networking, Applet Programming, Event Handling, Abstract Window Toolkit, Collection Framework.

CE303 Mathematical Foundation of Computer Science L T P C
3 1 - 4

Set Theory, Propositions and Computability, Permutations, Combinations and Discrete Probability, Relations and Functions, Graphs and Trees, Analysis of Algorithms, Recurrence Relations, and Recursive Algorithms

MA306 Applied Mathematics L T P C
3 1 - 4

Fourier Series and Transformation, Ordinary and Partial Differential Equations, Function of Complex Variables, Analytic Functions, Conformal Mapping, Wavelet Transformation.

SS342 ICT Tools and Security L T P C
- - 2 1

Different open source tools to develop and simulate web and mobile applications like OpenCV, MIT App inventor, PHP is used

SP343 Entrepreneurship L T P C
1 0 0 0

Entrepreneurship Profiles, Entrepreneurship Traits, Mindset, Entrepreneurship Process, Ideation, Opportunity Identification, Business Models, Legal Aspects of Business, Basic Marketing Concepts, Basic Financial Concepts, Developing A Business Plan

SEMESTER-IV

IT401 Communication Engineering L T P C
3 - 2 4

Principles of Amplitude Modulation, Angle Modulation, Introduction to digital modulation, Baseband transmission, Spread spectrum and multiplexing

CE402 Computer Organization L T P C
3 1 2 5

Computer architecture, Register transfer language, Instruction codes, Introduction, Computer Arithmetic, Input Output Organization, Memory Organization.

CE403 Data Structures L T P C
3 1 2 5

Introduction to Data Structures, Linear Data Structures & their sequential storage representation, on Linear Data Structures, Sorting & Searching, File Structure

MA403 Probability Statistics and Numerical Analysis L T P C
3 1 2 5

Probability, Bayes' Theorem, Marko Chain, Probability Distribution Functions, Measure of Central Tendency, Correlation, Regression, Sampling and Sampling Tests, Iterative Methods For Solving Transcendental and Algebraic Equations, Direct and Iterative Methods For Solving System of Linear Equations, Numerical Solution of Ordinary Differential Equations. Finite Differences and Interpolation, Numerical Differentiation and Integration, Related To Laboratory Work.

IT402 Seminar L T P C
- - 1 1

During semester, candidate has to study on any advance topics under the guidance of faculty. There will be an interim presentation on the status of the study and a final presentation for evaluation will be required to be done by the candidate and candidate is required to submit his/her seminar report in bounded form for evaluation purpose. The department will announce final date of presentation.

IT403 Mini Project-1 L T P C
- - 2 1

Each student has to take Java Technology based project in the important area of Information Technology.

CE406 Computer Peripherals Workshop L T P C
- 1 - 1

Working, architecture and troubleshooting of various peripherals like : Input devices, Output devices, Other Input and Output Devices

SS341 Economics for Engineers L T P C
2 0 0 2

Introduction to Micro and Macro Economics, Utility Function, Demand Function, Supply Function, Elasticity of Demand and Elasticity of Supply, Production Function, Economic Region of Production, Cost Function, Market and Revenue Function, National Income Accounting, Inflation, Money and Banking, Public Finance

SP341 Ethics and Values L T P C
1 0 0 0

Ethics, Values, Morals, Utilitarianism, Libertarianism, Relativism, Egoism, False Consciousness, Determinism, Need of Professional Ethics, Technology and Ethics, Natural Laws and Natural Rights, Intrinsic Vs. Extrinsic Value, Kant's Moral Theory, John Rawls' Theory of Justice, Kohlberg's Six Stages of Moral Development, Applied Ethics.

SP344 Community Services L T P C
- - 1 -

After successful completion of the course, student will be able to envisage their role and responsibilities towards the society, develop responsiveness towards the challenges and issues of the nation like – poverty, illiteracy, hunger, etc. understand the problems and to ponder the solutions at large.

SEMESTER V

CE501 Theory of Computation L T P C
3 1 - 4

Review of Mathematical Terms and Theory, Finite Automata, Context Free Grammar, Pushdown Automata, Regular Language, Context Free Language, NFA, Turing Machines, Recursive Language.

CE502 Database Management L T P C
Systems 3 1 2 5

Introductory concepts of DBMS, An Architecture for a Database System, An Introduction to Relational databases, Relational Data Objects: Domains and

Relations, Relational Data Integrity, Relational Operators, The Entity / Relationship Model, Functional Dependencies, Database Design, Data Storage and Querying, Transactions, Recovery, Concurrency, Introduction to database Security

IT501 Data Communication L T P C
Networks 3 1 2 5

Introduction and use of Computer Networks, Network Hardware, Network Software, Reference Models, Example Networks and standards, Physical Layer, Multiplexing and spreading techniques, Data Link Layer: Data link Layer Design Issues, Medium Access Control Sub layer, Network Layer, Transport Layer, Application Layer

CE504 Operating System L T P C
3 1 2 5

Introduction, Process Scheduling, Inter process Communication (IPC), Classical IPC Problems, Deadlock, Memory Management – Paging, Input Output Management-Principles of input/output, Disks, File Systems, Introduction to Multiprocessor and Distributed Operating System, Case Study of any Open Source Operating System based on above concept

IT502 Web Designing L T P C
2 - 2 3

Introduction to WWW, Web Servers, HTML, Cascaded Style Sheet, JavaScript, DHTML, Net framework, Java Script, Building Interactive Animation,

IT503 Mini Project – II L T P C
- - 2 1

Each student has to carry out project which may be in form of product preparations, working/non-working models, prototype development, fabrication of set-ups, experiment development, process modification /development, simulation, software development, integration of software and hardware, statistical data analysis, survey, creating awareness in society.

SS562 Law for Engineers L T P C
2 - - 2

Introduction to Basics and Sources of Indian Legal System Indian Contract Act (Elements of a Valid Contract, Void and Voidable Contracts, Discharge of a Contract and Remedies for Breach of Contract), Indian Patent Act, Cyber Law (E-Commerce and E-



Governance in India), Joint Venture in India, Human Rights and Labour Laws in India, Right to Information, Environment and Law, Patent, Contract, Engineering Ethics Etc.

SP501 Fractional Course **L T P C**
1 - - -

Domain knowledge of various fundamental subjects provided by an experts and each student has to prepare a report based on subject to fulfill the requirement of academic.

SEMESTER VI

IT601 Software Engineering **L T P C**
3 - 2 4

Software process and lifecycle, Software requirement engineering, Design Concepts, Risk Management, Software Testing, Verification and validation of Software, Overview of recent trends in Software Engineering, Security Engineering, Agile Methods, Service Oriented Software Engineering, Aspect Oriented Software Development.

CE601 Design and Analysis of Algorithms **L T P C**
3 1 - 4

Elementary Algorithmic, Analysis Techniques, Analysis of Algorithms, Solving Recurrences, Data Structures, Greedy Algorithms, Divide-and-Conquer, Dynamic Programming, Branch and Bound, Backtracking, Brief Overview of NP theory

Elective I

CE611 .net Technologies **L T P C**
3 - 2 4

Introduction to 3-tier Client Server Systems, Web Application Basics, ASP.NET fundamentals, page rendering model, custom rendered controls, composite controls, ASP.NET server control and client-side scripts, Advanced Features, Caching and State Management, Diagnostics and plumbing, Working with XML, Services, AJAX, Deployment and silver light.

CE621 Java Technologies **L T P C**
3 - 2 4

Introduction to Swing, Java database Programming, Java Servlet Programming and Web Development, Conversational States, Java Server Pages, Introduction to Struts Programming and Architecture, Executing Struts, Introduction to Distributed Applications RMI and CORBA.

CE631 Objective C Programming **L T P C**
3 - 2 4

Introduction to Objective C, User Interface Controls, Language Fundamentals, Object – Oriented Programming, Objective-C Language Features, Using File System, Networking, User Interfaces, Data Management with Core Data, Writing an Application, Distributed Application.

CE641 Embedded C Programming **L T P C**
3 - 2 4

Embedded System Programming Issues, C language for Embedded System, ATMEL AVR series Micro Controller Architecture, C programming with ATMEL AVR Series Controllers, Embedding OS in AVR micro Controllers, Application Development, Remote Debuggers, Emulators, Simulators, Optimizing Code.

CE651 LAMP Technologies **L T P C**
3 - 2 4

Introduction to LAMP Technology, MySQL, PHP Programming fundamentals, Object Oriented programming with PHP, MVC Architecture, File Handling: Understanding PHP File Permissions, File Reading and Writing Functions, Filesystem and Directory Functions, Network Functions, Date and Time Functions

CE661 Mobile Applications Developments **L T P C**
3 - 2 4

Introduction to Mobile Computing, Factors in Developing Mobile Applications, User Interfaces, Mobile application Development Components, Storing and Retrieving Data, Communications via Network and the Web, Notifications and Alarms, Graphics, Mobility and Location Based Services, Security and Hacking: Active Transactions, More on Security, Preventing Hacking of latest mobile Devices.

IT764 System Software **L T P C**
3 - 2 4

Introduction to System Software, Assemblers, Loader and Linker, Macro Processors, Introduction to Compiler, Device Drivers, Design of Editors & Debuggers.

Elective II

IT612 Advanced Computer Network **L T P C**
3 1 - 4

Introduction to High Speed Networks like Frame Relay, ATM, X.25, Optical Carrier, Congestion and Traffic Control, QoS in IP Networks, Wireless Networks, Wireless Sensor Networks.

IT622 Machine Human Interface **L T P C**
3 1 - 4

Introduction to human paradigm, computer paradigm, interaction paradigm, Design process, Models and Theories, Groupware, Ubiquitous computing and augmented realities.

IT632 Computer Graphics and Visualization **L T P C**
3 1 - 4

History and classes of graphics output devices, video processors, Color Models, Parametric curves and surfaces, 3D model reconstruction from 2D images, Coordinate systems, Projections, transformations, Polygonal B-object representation, special modeling, animation, morphing, Lighting and generalized lighting models, introduction to scientific visualization and simulation, OpenGL.

IT642 Main Frame Systems **L T P C**
3 1 - 4

Evolution of Mainframe hardware, Mainframe OS and Terminology, z/OS and its features, introduction to Job Control language, COBOL programming, DB2, Mainframe Application Development guidelines.

IT652 Network Security and Encryption **L T P C**
3 1 - 4

Network Security Model, OSI security architecture, Classical Encryption Techniques, Symmetric Ciphers, Asymmetric Ciphers Integrity, IPSec.

IT662 Cloud Computing **L T P C**
3 1 - 4

Introduction to cloud computing, layers and types of clouds, Virtualization, Cloud Services, SaaS, IaaS,

PaaS, MapReduce Programming Models and Implementations, Migrating into a Cloud, Management and Monitoring, Security.

IT692 Software Testing **L T P C**
3 1 - 4

Role of Testing, Verification and validation, V-Test Model, Test Planning and Design, Monitoring and Measuring Test Execution, Testing Techniques, System Test Categories, System Test Planning and Automation, System Test Execution, Acceptance Testing, Case Study.

IT682 Business Analysis and Optimization **L T P C**
3 1 - 4

Introduction to Business Analysis, Business Process Change, Project Management, Financial Analysis, Principles of E-Business, E-Business applications, Optimization.

Elective III

CE613 IT Industry Management **L T P C**
3 1 - 4

IT Infrastructure and Emerging Techniques, Foundation of Business Intelligence, Database and Information Management, Securing Information Systems, Achieving Operational Excellence, Managing Information Systems Projects, Managing Global Systems, Performance and Tuning, IT Ethics, Legislation and Outsourcing.

CE623 Machine Learning **L T P C**
3 1 - 4

Theory and Practices in machine learning, Supervised Learning, Unsupervised Learning, Kernel Methods, Reinforcement Learning, Evolutionary Computing, Evaluation Techniques.

CE633 Data Mining **L T P C**
3 1 - 4

Different types of data, data mining functionalities, classification of data mining systems, major issues in data mining, Data preprocessing, data warehouse and OLAP technology, data cube computation and data generalization, Mining Frequent patterns, associations and correlations, classification and prediction, cluster Analysis.

CE643 Parallel and Distributed Computing **L T P C**
3 1 - 4



Introduction to parallel processing, distributed parallel computing, processes and shared memory programming, basic parallel programming techniques, thread-based implementation, distributed computing systems, distributed coordination, issues in distributed systems.

CE653 Advanced Data Structures L T P C
3 1 - 4

Elementary Data Structures, Search Trees, Balanced Search Trees, Tree Search for set of Intervals, Heaps, Union - Find and related structures, Data Structures Transformations, Data Structures for Strings, Hash Tables.

CE663 Natural Language Processing L T P C
3 1 - 4

Introduction to various NLP, Regular Expressions, N-gram Language Models, Sequence Labeling, Part of Speech Tagging and Hidden Markov Models, Meaning, Web 2.0 applications, Machine Translation.

IT602 Mini Project – III L T P C
- - 2 1

Each student has to carry out project which may be in form of product preparations, working/non-working models, prototype development, fabrication of set-ups, experiment development, process modification/development, simulation, software development, integration of software and hardware, statistical data analysis, survey, creating awareness in society.

University Elective – I

UEIL002 Information Technology and Cyber Law L T P C
3 - - 3

Information Technology, Stakeholders in cyber world, Issues related to Software and Web designing, Regulating Information Technology, Cyber Crimes, Investigation of cyber crimes, Issues and challenges to cyber law

UEIL007 Forensic Science and Law L T P C
3 - - 3

Scene of crime and sight of Law, Proved beyond doubt? Scientific Technique in Criminal Investigation, Scientific Evidence in Court of Law, Need for caution: Problematising Pitfalls, Scientific race and legal pace: struggle of catching up

UEIL008 Energy and Law L T P C
3 - - 3

Energy from Non- renewable sources (Coal, oil and natural gas)

The goal that India seeks to achieve is to secure availability of coal to meet the demand of various sectors of the economy in an eco-friendly, sustainable and cost effective manner. This unit seeks to study as to why coal is such an important sector under energy law regime and how is the production of this non-renewable source of energy regulated? What do we understand by the concept of power generation? What are the main components of a thermal power plant and what sort of an effect does this energy production and use have on the climate?

The Petroleum and Natural Gas Regulatory Board Act 2006 : It establishes the Petroleum and Natural Gas Regulatory Board to regulate the various activities in the production chain of petroleum products and natural gas. This Unit studies the need for Oil and Natural gas as a source of non-renewable energy and the alternatives that are available to this energy source. How the energy resource is generated and made available for consumers? Whether or not the laws relating to this energy source are adequate to address the issues relating to the pricing of oil and regulation of prices in the domestic market in accordance to the prices fluctuation in the international market? How does the Government of India make provisions for subsidies in this sector?

UEIL013 Right to Information L T P C
3 0 0 3

Origin and Development of Right to Information, Introduction of Right to Information, The Central Information Commission, The state Information

Commission, Appeal against the order of Public Information Officer, Monitoring and Reporting, Right to Privacy Vs. Right to Information

UEIM001 Indian Economy L T P C
3 - - 3

Objectives And Strategy of Economic Planning In India; Approach To the on-going Five Year Plan; Regional Planning In India; Financing of The Plans; Economic Reforms In India – Main Features And Achievements; Institutional And Technological Reforms In Indian Agriculture; Agricultural Finance And Marketing; Agricultural Prices And Policy; Industrial Policy; Sources of Industrial Finance; Role of Small Scale And Cottage Industries In Indian Economy; India's Balance of Payments – Problems And Solutions; Trends, Composition And Direction of India's Foreign Trade; New Trade Policy; WTO And Indian Economy; Foreign Investment Inflows; India's Exchange Rate Policy; Problems Of Poverty; Inequality; Unemployment And Inflation - Strategy And Policy of The Government; Food Security And Public Distribution System; Salient Features of The Relevant Union Budget

UEIM002 Introduction to L T P C
Strategic Management 3 - - 3

Meaning & Scope of Strategy; The process of strategic management; Introduction to the Vocabulary of Strategy: Vision, Mission, Goals, Objectives, Values, Strategy, Resources and Capabilities; Sectors & Industries; Analysing A Company's External Environment; Understanding A Company's Strategy, Resources, Capabilities; Phases In Industry's Development; Generic Strategies; Analytical Tools For Competitive Advantage; People Management Aspects; Resource Management And Operations; Corporate Culture And Leadership Issues;

UEIM003 Fundamentals of L T P C
International Business 3 - - 3

Evolution Of International Business; Stages Of Internationalization; International Business Approaches; Importance Of Cross Cultural Differences In International Business; Modes Of Entry Into International Markets; Advantages And Problems Of International Business; Mercantilism; Theory Of Absolute Cost And Comparative Cost

Advantage; Relative Factor Endowment Theory; Product Life Cycle Theory; Porter's National Competitive Advantage Theory; Foreign Collaboration/Technology Transfer Related Issues; Factors Influencing FDI; Reasons And Cost And Benefits Of FDI; Concept Of Balance Of Payments And Its Components; Terms Of Payment; Concept Of Globalization; Drivers Of Globalization; Globalization Of Markets, Production, Investment, Technology; Advantages And Disadvantages Of Globalization; General Agreement Of Tariff And Trade; Uruguay; Round, Establishment Of WTO And Various Agreement Of WTO; GATS - Trade In Services; Concept Of Regional Integrations And Regional Blocks; Policy And Service Support Organizations; Commodity Specialization; Training And Research Institutions; Trading / Service Corporations; Risk Covering Institutions; Financial Institutions; Institutions Especially For Ssis and State Participation; An Overview Of India's Foreign Trade Policy And Procedure

UEIP003 Health and Nutrition L T P C
3 - - 3

Introduction to the basic concepts of health and nutrition, Nutrition including macronutrients, micronutrients and significance of macronutrients and micronutrients for optimal health, Functional foods including role of functional ingredients and food in nutrition, Health attributes of functional foods, Indicators for maintenance of nutritional status like nutrition balance indicator, satiety index, fullness factor, glycemic index and insulin index, Lifestyle modifications for management of various disorders, Understanding food labelling including nutrition facts panel, serving size, calories, ingredients list, quantitative indications, food additives, the percent daily value, allergen labelling.

SS561 Creativity and Innovation L T P C
2 0 0 2

Introduction to Creativity and Innovation, Creativity V/s. Innovation, Lateral Thinking, Engineering and Creativity, Creativity in Problem Solving, Tools for Creativity, Whole New Brain, Skills for Disruptive Innovators, Medici Effect, Triz Innovation, Bio Mimicry, Jugaad Innovation, Ideo Design Thinking Model, Case Study

**SP601 Capstone Course****L T P C****1 - - -**

An overview of C programming, Object Oriented Concepts, Fundamentals of Digital Electronics, Data Structure and Algorithms, Database Management Systems, Overview Computer Graphics, Basics Discrete Mathematics, Microprocessor Architecture and Programming, Basics of MIS, Operating Systems, Computer Architecture and Peripherals, Overview of Web Technologies, Overview of Theory of Automata and Formal Languages, Computer Networks, An overview of Information Theory and coding.

SEMESTER VII**IT701 Network protocols****L T P C****3 1 - 4**

Introduction, IP Layer Functionality, Transport Layer functionality, Application Layer Functionality, Security

IT702 Information Retrieval Systems**L T P C****3 - 2 4**

Overview and Architecture of IRS, Document Representation, Retrieval Models, Search and Filtering Techniques, Machine Learning techniques in IR, Multimedia and Multilingual IR.

IT7A4 Network Programming**L T P C****3 - 2 4**

Client Server Example, Protocol independence, error handling, transport layer, TCP and UDP sockets, Name and Address Conversion, IPv4 and IPv6 interoperability, Broadcasting and Multicasting, Threads, Remote Procedure Calls, Web Services.

IT704 Minor Project**L T P C****- - 4 2**

Each student has to carry out project which may be in form of product preparations, working/non-working models, prototype development, fabrication of set-ups, experiment development, process modification/development, simulation, software development, integration of software and hardware, statistical data analysis, survey, creating awareness in society.

IT705 Open Source Development**L T P C****Lab****- - 2 1**

Content Management System (CMS), Python, Perl, Version Control.

SS701 Organizational Behavior**L T P C****2 - - 2**

Introduction to Organizational Behavior, Nature and Scope Individual Behavior, Values & Personality Learning & Perception Motivation, Theories of Motivation Leadership Group Dynamics, Group Properties, Group Decision Making Managing Change in Organization Organizational Culture

Elective IV**IT714 Database Administration****L T P C****3 - 2 4**

Managing Views, Programming Database, Database Architecture, Database Storage, Database Configuration, Network Configuration, Background Processes, Backup and recovery, Security, Managing Transaction, Database Tuning and Performance.

IT724 Artificial Intelligence**L T P C****3 1 - 4**

Introduction to Artificial Intelligence, Knowledge, Problem Spaces, Knowledge Representation, Weak Slot-And-Filler Structure, Search and Control Strategies, Reasoning, Game Playing, Natural Language Processing, Expert System, Knowledge Acquisition, Programming Language (PROLOG).

IT734 System Administration**L T P C****3 - 2 4**

Essential task of system administrators, booting and shutting down, rootle powers, controlling processes, file systems, backups, log file management, kernel and device drivers, network management and debugging, security.

IT744 Digital Image Processing**L T P C****3 - 2 4**

Fundamentals of DIP, Image Enhancement in spatial and frequency domain, Image restoration, Color Image Processing, Image Compression,

Morphological Image Processing, Image Segmentation, Representation and description.

IT754 Wireless Networks L T P C
3 - 2 4

Applications and needs of wireless networks, Wireless LAN, Telecommunication systems, Mobile Network Layer, Mobile Transport Layer, Wireless Ad-hoc Networks, WANET, Wireless Sensor Network.

IT784 Data Compression L T P C
3 - 2 4

Compression Techniques, Modeling and Coding, Mathematical, Preliminaries for Lossless Compression, Huffman Coding, Arithmetic Coding, Dictionary Techniques, Mathematical Preliminaries for Lossy Coding, Scalar Quantization, Vector Quantization, Transform Coding, Wavelet based Compression.

IT794 Compiler Construction L T P C
3 - 2 4

Overview of Translation Process, Lexical Analysis, Hard Coding and Automatic Generation Lexical Analyzers, Parsing Theory, Error Recovery, Intermediate Code Generation, Run Time Memory Management, Code Generation, Code Optimization.

IT7B4 Web Security L T P C
3 - 2 4

Introduction to vulnerabilities, threats and counter measures, Generic Security Model, HTTP security, Proxy Servers and Firewalls, Cryptographic Techniques, Internet security protocols, SSL and TLS protocols, Certificate management and Public key infrastructures, Authentication and authorization Infrastructures, Electronic Payment Systems, Client Side Security, Server Side Security, Privacy Protection and Anonymity Services.

IT7C4 Big Data Analytics L T P C
3 - 2 4

Introduction to Data Analytics, Introduction to Big Data, Introduction to Big Data Analytics, The big Data technology landscape, Hadoop, Frameworks.

IT7D4 Agile Software Development L T P C
3 - 2 4

Fundamentals of Agile, Agile Framework, Agile Testing, Agile Software Design and Development, Industry Trends.

IT7E4 Secure Software L T P C
Engineering 3 - 2 4

Building security into the software development lifecycle, secure design principles, and patterns, secure software specifications and requirements, secure software development practices, secure testing, Software quality assurance and benchmarking measurements.

Institute Elective

EC002 Embedded System L T P C
3 - - 3

Overview, characteristics, application, processor technology, IC technology, types of embedded system, processors, data acquisition system, real time operating system, device drivers, network for embedded systems, embedded system design.

EC003 Wireless Sensor Networks L T P C
3 - - 3

Introduction and Overview of Wireless Sensor Networks, Wireless Transmission Technology and Systems, Medium Access Control Protocols for Wireless Sensor Networks, Routing Protocols for Wireless Sensor Networks, Transport Control Protocols for Wireless Sensor Networks, Middleware for Wireless Sensor Networks, Network Management for Wireless Sensor Networks, Operating Systems for Wireless Sensor Networks

HS001 Entrepreneurship L T P C
Development 3 - - 3

Entrepreneurship Definitions, Structures, Culture, Concepts, Traits, Qualities and Characteristics, Nature, Project Management, Financial Analysis, Sources of Finance, Marketing Environment

HS003 Introduction to Accounting L T P C
3 - - 3

Accounting Equation, Journal, Ledger, Trial Balance, Profit and Loss Account, Balance Sheet, Cost Classification, Cost, Volume, Profit Analysis, Budgetary Control, Standard Costing

HS005 Technical Writing L T P C
3 - - 3

Introduction Objectives, Purpose, Importance and Characteristics, HPI, Six Sigma, TQM, Audience Recognition and Involvement, Levels, Gender Neutral Language and Fog Index, Technical Description, Organization Ethics In Technical



Writing, Technical Instructions and Users' Manual, Memos, Letters and Emails, Memorandum Writing, Report Writing : Letter Writing: Job Application: Writing For Newsletters, Business Proposals, Technical Brochure Designing, SOP Writing, Summaries, Abstracts and Instructions, Case Studies on Technical Writing.

HS014 Banking and Finance **L T P C**
3 - - 3

Indian Financial System, Banker Customer Relationship, Sources and Uses of Funds, Deposit Management, Cheques, Cash Management, Lending Activities, Credit Policy, Retail Banking, Corporate Banking, Fee, Based Services.

HS016 Applied Literature **L T P C**
3 - - 3

Introduction to Literary Criticism, Introduction to Cultural Studies, Multidimensional Readings, Critical Evaluation, Poetics of Transgression and Resistance, Power Dynamics, Identity Politics, Discourse Analysis.

ME004 Cryogenics **L T P C**
3 - - 3

Low temperature properties, gas liquefaction systems, cryogenic refrigeration systems, measurement systems for low temperatures, cryogenic fluid storage, insulations, cryogenic fluid transfer systems, application of cryogenic systems.

ME011 Renewable Energy Source **L T P C**
3 - - 3

Energy Scenario of India and world, renewable energy sources, solar energy sources, solar energy applications, wind energy and its applications, biomass, tidal.

SP701 Practical Training **L T P C**
- - - -

Each student has to carry out project based on practical training given to them on latest technologies used in the field of computer which may be in form of software development, data analysis and network configuration and security.

SEMESTER – VIII

IT801 Major Project **L T P C**
- - 30 21

The scope, extent and the academic/laboratory/application content will be commensurate with a full semester. Major components of the Project will include identifying the system, deciding the aims and objectives to be achieved, modules to be studied, analysis, innovations/ research, laboratory/ application studies. Evaluation in terms of results achieved.

Audit Course

ITA01 Indian Culture **L T P C**
2 - - -

Culture, Different cultures and their typical characteristics, Indian way of thinking, Indian way of life, Indian way of worship, Case study of any cultural value / ritual / festival / thinking.

Signature
verified by

