SONA COLLEGE OF TECHNOLOGY, SALEM-5

(An Autonomous Institution)

B.Tech-Information Technology

CURRICULUM and SYLLABI

[For students admitted in 2022-2023]

B.E / B.Tech Regulation 2019

Approved by BOS and Academic Council meetings

Sona College of Technology, Salem

(An Autonomous Institution)

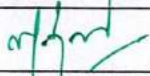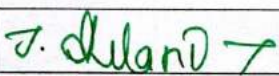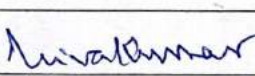### Courses of Study for B.E/B. Tech. Semester I under Regulations 2019 (CBCS)
Branch: Information Technology

S.No	Course Code	Course Title	L	T	P	C	Category	Total Contact Hours
		Theory						
1	U19MAT102A	Linear Algebra and Calculus	3	1	0	4	BS	60
2	U19ENG101C	Communication skills in English- I	2	0	0	2	HS	30
3	U19PHY103C	Engineering Physics	3	0	0	3	BS	45
4	U19BEE106A	Basic Electrical and Electronics Engineering	3	0	0	3	ES	45
5	U19PPR105	Problem Solving using Python Programming	3	0	0	3	ES	45
		Practical						
6	U19PHL110	Engineering Physics Laboratory	0	0	3	1.5	BS	45
7	U19BEEL113A	Basic Electrical and Electronics Engineering Laboratory	0	0	2	1	ES	30
8	U19PPL111	Python Programming Laboratory	0	0	2	1	ES	30
9	U19GE101	Basic Aptitude – I	0	0	2	0	EEC	30
		Total Credits				18.5		
		Optional Language Elective*						
10	U19OLE1101	French	0	0	2	1	HS	30
11	U19OLE1102	German						30
12	U19OLE1103	Japanese						30

*Students may opt for foreign languages viz., German/French/Japanese with additional one credit (Not accounted for CGPA calculation)

Approved By

Chairperson, Science and Humanities BoS	Chairperson, Information Technology BoS	Member Secretary, Academic Council	Chairperson, Academic Council & Principal
Dr. M. Renuga	Dr. J. Akilandeswari	Dr. R. Shivakumar	Dr. S. R. R. Senthil Kumar

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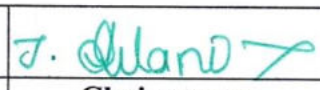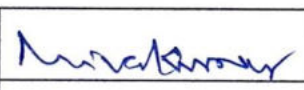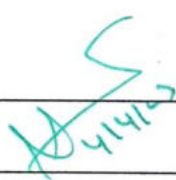HOD/ Information Technology, First Semester B.Tech. IT Students and Staff, COE

S.No	Course Code	Course Title	L	T	P	C	Category	Total Contact Hours
Theory								
1	U19TAM201	தமிழர் மரபு / Heritage of Tamils	1	0	0	1	HSMC	15
2	U19MAT202D	Applied Probability and Statistics	3	1	0	4	BSC	60
3	U19ENG201C	Communication Skills in English-II	2	0	2	3	HSMC	60 (30L+30P)
4	U19CHE204B	Applied Chemistry	3	0	0	3	BSC	45
5	U19EGR206A	Engineering Graphics	2	0	2	3	ESC	60 (30L+30P)
6	U19IT201	Programming in C	3	0	0	3	PCC	45
7	U19IT202	Information Technology Essentials	2	0	0	2	ESC	30
Practical								
8	U19IT203	Programming in C Laboratory	0	0	3	1.5	PCC	45
9	U19CHL209	Engineering Chemistry Laboratory	0	0	3	1.5	BSC	45
10	U19GE201	Basic Aptitude – II	0	0	2	0	EEC	30
		Total Credits				22		
Optional Language Elective*								
11	U19OLE1201	French	0	0	2	1	HSMC	30
12	U19OLE1202	German						
13	U19OLE1203	Japanese						

*Students may opt for foreign languages viz., German/French/Japanese with additional one credit (Not accounted for CGPA calculation)

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Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester III under Regulations 2019 (CBCS)
Branch: Information Technology

S. No	Course Code	Course Title	Lecture	Tutorial	Practical	Credit	Total Contact Hours
Theory							
1	U19MAT301D	Discrete And Combinatorial Mathematics	3	1	0	4	60
2	U19IT301	Data Structures	3	0	0	3	45
3	U19IT302	Digital Logic Design	3	0	0	3	45
4	U19IT303	Computer Architecture	3	0	0	3	45
5	U19IT304	Object Oriented Programming in C++	3	0	0	3	45
6	U19TAM301	தமிழரும் தொழில்நுட்பமும்/ Tamils and Technology	1	0	0	1	15
7	U19GE303	**Mandatory Course-** Essence of Indian Traditional Knowledge	2	0	0	0	30
Practical							
8	U19IT305	Data Structures using C++ Laboratory	0	0	4	2	60
9	U19IT306	Digital Logic Design Laboratory	0	0	2	1	30
10	U19ENG301	Communication Skills Laboratory	0	0	2	1	30
11	U19GE301	Soft Skills and Aptitude – I	0	0	2	1	30
					Total Credits	22	

Approved By

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Member Secretary, Academic Council
Dr.R.Shivakumar

Chairperson, Academic Council & Principal
Dr.S.R.R.Senthil Kumar

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Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester IV under Regulations 2019 (CBCS)
Branch: Information Technology

S. No	Course Code	Course Title	Lecture	Tutorial	Practical	Credit	Total Contact Hours
		Theory					
1	U19MAT401C	Operations Research	3	1	0	4	60
2	U19IT401	Operating Systems	3	0	2	4	75
3	U19IT402	Principles of Communication	3	0	0	3	45
4	U19IT403	Design and Analysis of Algorithms	3	0	2	4	75
5	U19IT404	Java Programming	3	0	0	3	45
6	U19GE402	**Mandatory Course-** Environment and climate science	2	0	0	0	30
		Practical					
7	U19IT405	Java Programming Laboratory	0	0	2	1	30
8	U19IT406	Microprocessors Laboratory	1	0	2	2	45
9	U19GE401	Soft Skills and Aptitude - II	0	0	2	1	30
					Total Credits	22	

Approved By

Chairperson, Information Technology BoS
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Member Secretary, Academic Council
Dr.R.Shivakumar

Chairperson, Academic Council & Principal
Dr.S.R.R.Senthil Kumar

22-12-2023

SONA COLLEGE OF TECHNOLOGY, SALEM- 5
DEPARTMENT OF INFORMATION TECHNOLOGY
B Tech- IT- 2019 Regulations
<u>List of Elective's</u>

S. No	Course Code	COURSE TITLE	L	T	P	C
1.	U19IT901	Numerical Methods	3	0	0	3
2.	U19IT902	C# AND .NET	2	0	2	3
3.	U19IT903	Advanced Java Programming	3	0	0	3
4.	U19IT904	Embedded Systems	3	0	0	3
5.	U19IT905	Information Security	3	0	0	3
6.	U19IT906	Graph Theory	3	0	0	3
7.	U19IT907	Wireless Technologies	3	0	0	3
8.	U19IT908	Business Intelligence	3	0	0	3
9.	U19IT909	Image Processing	3	0	0	3
10.	U19IT910	Digital Signal Processing	3	0	0	3
11.	U19IT911	Cloud Computing	3	0	0	3
12.	U19IT912	Total Quality Management	3	0	0	3
13.	U19IT913	Software Quality Assurance	3	0	0	3
14.	U19IT914	Linux Internals	3	0	0	3
15.	U19IT915	Distributed Databases	3	0	0	3
16.	U19IT916	Natural Language Processing	3	0	0	3
17.	U19IT917	Cyber Security	3	0	0	3
18.	U19IT918	Intellectual Property Rights	3	0	0	3
19.	U19IT919	Ethical Hacking	3	0	0	3
20.	U19IT920	Mobile Application Development	3	0	0	3
21.	U19IT921	Wireless Sensor Networks	3	0	0	3
22.	U19IT922	Information Retrieval	3	0	0	3
23.	U19IT923	Mobile Computing	3	0	0	3
24.	U19IT924	Multi-Core Architecture	3	0	0	3
25.	U19IT925	Agile Software Development	3	0	0	3
26.	U19IT926	Robotic Process Automation	3	0	0	3
27.	U19IT927	Data Science	3	0	0	3
28.	U19IT928	Advanced Python Programming for Data Science	3	0	0	3
29.	U19IT929	Human Computer Interaction	2	0	2	3
30.	U19IT930	Block Chain Technology	3	0	0	3
31.	U19IT931	Deep Learning	3	0	0	3

SONA COLLEGE OF TECHNOLOGY (AUTONOMOUS), SALEM-5.

DEPARTMENT OF INFORMATION TECHNOLOGY

B TECH- INFORMATION TECHNOLOGY

LIST OF PROFESSIONAL ELECTIVES FOR HONOURS DEGREE

Vertical 1 CLOUD COMPUTING	Vertical 2 INTERNET OF THINGS	Vertical 3 CYBER SECURITY	Vertical 4 DATA ANALYTICS	Vertical 5 CREATIVE MEDIA
Cloud Computing	Introduction to 5G	Fundamentals of Cyber Security	Fundamentals of Data Science	Augmented and Virtual Reality
Virtualization	Introduction to Cyber-Physical System	Cyber Laws and Standards	Exploratory Data Analysis using R and Tableau	Multimedia and Animation
Dockerization and Kubernetes	Wireless Technology	Ethical Hacking	Big Data Analytics	Video Creation and Editing
Big Data on Cloud	Wireless Sensor Networks	Network Vulnerability Assessment	Business Intelligence	UI And UX Design
Cloud Application Development and Deployment	Introduction to IoT	Cyber Forensics	Deep Learning	Digital Marketing
Security and Privacy in Cloud	Software Defined Networks	Information Security Risk Management	Natural Language Processing	Visual Effects
Container Orchestrations and Infrastructure Automation	Network Programming	Security Operations and Incident Management	Social Network and Web Analytics	Game Development
Cloud Networking	Industry 4.0	Cryptocurrency and Blockchain Technologies	Recommender System	Multimedia Data Compression and Storage
Capstone Project in **CLOUD COMPUTING** (*Mandatory Elective Course for Earning Specialization Degree)	Capstone Project in **NETWORKING** (*Mandatory Elective Course for Earning Specialization Degree)	Capstone Project in **CYBER SECURITY** (*Mandatory Elective Course for Earning Specialization Degree)	Capstone Project in **DATA ANALYTICS** (*Mandatory Elective Course for Earning Specialization Degree)	Capstone Project in **CREATIVE MEDIA** (*Mandatory Elective Course for Earning Specialization Degree)
Maximum of two SWAYAM courses in Specific Vertical identified by Department Consultative Committee				

SONA COLLEGE OF TECHNOLOGY (AUTONOMOUS), SALEM-5.

DEPARTMENT OF INFORMATION TECHNOLOGY

B TECH- INFORMATION TECHNOLOGY
Honours Degree- Verticals & Courses
(Offered to UG students admitted during AY 2021- 2022 onwards, Regulation 2019)

VERTICAL 1 – CLOUD COMPUTING

S.No	Course Code	Course Title	L	T	P	Credit
1.	U19IT911	Cloud Computing	3	0	0	3
2.	U19IT2001	Virtualization	3	0	0	3
3.	U19IT2002	Dockerization and Kubernetes	3	0	0	3
4.	U19IT2003	Big Data on Cloud	3	0	2	4
5.	U19IT2004	Cloud Application Development and Deployment	3	0	2	4
6.	U19IT2005	Security and Privacy in Cloud	3	0	2	4
7.	U19IT2006	Container Orchestrations and Infrastructure Automation	3	0	0	3
8.	U19IT2007	Cloud Networking	3	0	2	4
9.	U19IT2008	Capstone Project in Artificial Intelligence and Data Science (*Mandatory for Earning Specialization Degree)	0	0	4	2
Maximum of two SWAYAM courses in CLOUD COMPUTING vertical identified by Department Consultative Committee of the department.						

VERTICAL 2 – INTERNET OF THINGS

S. No	Course Code	Course Title	L	T	P	Credit
1.	U19IT2009	Introduction to 5G	3	0	0	3
2.	U19IT2010	Introduction to Cyber-Physical System	3	0	0	3
3.	U19IT907	Wireless Technologies	3	0	0	3
4.	U19IT2011	Wireless Sensor Networks	3	0	2	4
5.	U19IT2012	Introduction to IoT	3	0	2	4
6.	U19IT2013	Software Defined Networks	3	0	2	4
7.	U19IT2014	Network Programming	3	0	2	4
8.	U19IT2015	Industry 4.0	3	0	0	3
9.	U19IT2016	Capstone Project in Networking (*Mandatory for Earning Specialization Degree)	0	0	4	2
Maximum of two SWAYAM courses in INTERNET OF THINGS vertical identified by Department Consultative Committee of the department.						

VERTICAL 3 – CYBER SECURITY

S. No	Course Code	Course Title	L	T	P	Credit
1.	U19IT2017	Fundamentals of Cyber Security	3	0	0	3
2.	U19IT2018	Cyber Laws and Standards	3	0	0	3
3.	U19IT919	Ethical Hacking	3	0	0	3
4.	U19IT2019	Network Vulnerability Assessment	3	0	2	4
5.	U19IT2020	Cyber Forensics	3	0	2	4
6.	U19IT2021	Information Security Risk Management	3	0	0	3
7.	U19IT2022	Security Operations and Incident Management	3	0	2	4
8.	U19IT2023	Cryptocurrency and Blockchain Technologies	3	0	2	4
9.	U19IT2024	Capstone Project in Cyber Security (*Mandatory for Earning Specialization Degree)	0	0	4	2
Maximum of two SWAYAM courses in CYBER SECURITY vertical identified by Department Consultative Committee of the department.						

VERTICAL 4 – DATA ANALYTICS

S.No	Course Code	Course Title	L	T	P	Credit
1.	U19IT2025	Fundamentals of Data Science	3	0	0	3
2.	U19IT2026	Exploratory Data Analysis using R and Tableau	3	0	2	4
3.	U19IT2027	Big Data Analytics	3	0	2	4
4.	U19IT908	Business Intelligence	3	0	0	3
5.	U19IT2028	Deep Learning	3	0	2	4
6.	U19IT2029	Natural Language Processing	3	0	2	4
7.	U19IT2030	Social Network and Web Analytics	3	0	0	3
8.	U19IT2031	Recommender System	3	0	0	3
9.	U19IT2032	Capstone Project in Data Analytics (*Mandatory for Earning Specialization Degree)	0	0	4	2
Maximum of two SWAYAM courses in DATA ANALYTCS vertical identified by Department Consultative Committee of the department.						

VERTICAL 5 – CREATIVE MEDIA

S. No	Course Code	Course Title	L	T	P	Credit
1.	U19IT2033	Augmented and Virtual Reality	3	0	2	4
2.	U19IT2034	Multimedia and Animation	3	0	2	4
3.	U19IT2035	Video Creation And Editing	3	0	2	4
4.	U19IT2036	UI and UX Design	3	0	2	4
5.	U19IT2037	Digital Marketing	3	0	2	4
6.	U19IT2038	Visual Effects	3	0	2	4
7.	U19IT2039	Game Development	3	0	2	4
8.	U19IT2040	Multimedia Data Compression And Storage	3	0	2	4
9.	U19IT2041	Capstone Project in **CREATIVE MEDIA** (*Mandatory for Earning Specialization Degree)	0	0	4	2
Maximum of two SWAYAM courses in CREATIVE MEDIA vertical identified by Department Consultative Committee of the department.						

SONA COLLEGE OF TECHNOLOGY (AUTONOMOUS), SALEM-5.

DEPARTMENT OF INFORMATION TECHNOLOGY

Minor Degree- Verticals & Courses

(Offered to UG students admitted during AY 2021- 2022 onwards, Regulation 2019)

Vertical : ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

S.No	Course Code	Course Title	L	T	P	Credit
1	U19ADS2035	Python for Data Science	3	0	2	4
2	U19ADS2036	Probability and Statistics	3	0	0	3
3	U19ADS2037	Ethics and AI	2	0	2	3
4	U19ADS2038	Machine Learning	3	0	2	4
5	U19ADS2039	Big Data Analytics`	2	0	2	3
6	U19ADS2040	Business Intelligence	2	0	2	3
7	U19ADS2041	Deep learning	3	0	2	4
8	U19ADS2042	Data Visualization	3	0	2	4
9	U19ADS2043	Capstone Project in Artificial Intelligence and Data Science (Mandatory Elective Course)	0	0	4	2
Maximum of two SWAYAM courses in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE vertical (MINOR) identified by Department Consultative Committee of the department.						

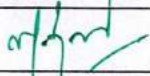## Sona College of Technology, Salem
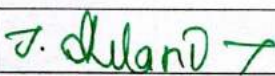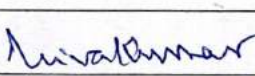
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Branch: Information Technology

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Theory								
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7	U19BEEL113A	Basic Electrical and Electronics Engineering Laboratory	0	0	2	1	ES	30
8	U19PPL111	Python Programming Laboratory	0	0	2	1	ES	30
9	U19GE101	Basic Aptitude – I	0	0	2	0	EEC	30
		Total Credits				18.5		
Optional Language Elective*								
10	U19OLE1101	French	0	0	2	1	HS	30
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12	U19OLE1103	Japanese						30

*Students may opt for foreign languages viz., German/French/Japanese with additional one credit (Not accounted for CGPA calculation)

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B. TECH. / INFORMATION TECHNOLOGY

SEMESTER – I		L	T	P	C
U19MAT102A	**LINEAR ALGEBRA AND CALCULUS**	3	1	0	4

COURSE OUTCOMES

At the end of the course, the students will be able to

1. find the rank of the matrix and solve linear system of equations by direct and indirect methods
2. apply the concepts of vector spaces and linear transformations in real world applications
3. apply the concepts of eigen values and eigen vectors of a real matrix and their properties in diagonalization and the reduction of a real symmetric matrix from quadratic form to canonical form
4. find the Taylor's series expansion, Jacobians and the maxima and minima of functions of two variables
5. apply appropriate techniques of multiple integrals to find the area and volume.

CO / PO, PSO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3		3	2							2		2
CO2	3	3		3	2							2		2
CO3	3	3		3	2							2		2
CO4	3	3		3	2							2		2
CO5	3	3		3	2							2		2

UNIT – I   LINEAR SYSTEM OF EQUATIONS   12

Rank of a matrix – Solution of linear system of equations by matrix method, Gauss elimination, Gauss-Jordan, Gauss-Jacobi and Gauss-Seidel methods.

UNIT – II   VECTOR SPACES   12

Vector Space – Linear independence and dependence of vectors – Basis – Dimension – Linear transformations (maps) – Matrix associated with a linear map – Range and kernel of a linear map – Rank-nullity theorem (without proof).

UNIT – III   EIGEN VALUES AND EIGEN VECTORS   12

Eigen values and eigen vectors of real matrices – Properties of eigen values and eigen vectors – Cayley-Hamilton theorem – Diagonalization of real symmetric matrices – Reduction of quadratic form to canonical form.

UNIT – IV   MULTIVARIABLE CALCULUS   12

Functions of several variables – Partial differentiation – Total derivative – Jacobians – Taylor's theorem for function of two variables – Maxima and minima of function of two variables without constraints – Constrained maxima and minima by Lagrange's method of undetermined multipliers.

UNIT – V   MULTIPLE INTEGRALS   12

Double integrals – Change of order of integration – Change of variables from Cartesian to polar coordinates – Area as double integrals in Cartesian coordinates – Triple integrals – Volume as triple integrals in Cartesian coordinates.

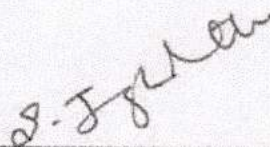Theory: **45 Hours**   Tutorial: **15 Hours**   Total: **60 Hours**
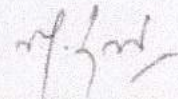
TEXT BOOKS:

1. T. Veerarajan, "Linear Algebra and Partial Differential Equations", McGraw Hill Publishers, 1st Edition, 2018.
2. T. Veerarajan, "Engineering Mathematics for Semesters I & II", McGraw Hill Publishers, 1st Edition, 2019.

REFERENCE BOOKS:

1. S. Lipschutz and M. L. Lipson, "Linear Algebra", McGraw Hill Publishers, 6th Edition, 2018.
2. E. Kreyszig, "Advanced Engineering Mathematics", Wiley Publishers, 10th Edition, Reprint, 2017.
3. C. Prasad and R. Garg, "Advanced Engineering Mathematics", Khanna Publishers, 1st Edition, 2018.
4. B. V. Ramana, "Higher Engineering Mathematics", McGraw Hill Publishers, 29th Reprint, 2017.
5. B. S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 44th Edition, 2018.

Prof. S. JAYABHARATHI
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Dr. M. RENUGA
BoS - Chairperson
Science and Humanities
Sona College of Technology
Salem – 636 005

10. 05. 2019   B. E. / B. Tech. Regulations 2019

U19ENG101C – **Communication Skills in English – I**

First year I semester

Common to IT

Course Outcome: At the end of course, the students will be able to
1. Use grammatical components effectively in both written and spoken communication
2. Develop speaking skills for self-introduction, delivering speeches and technical presentation.
3. Speak effectively in real time and business situations
4. Write email, formal letters and descriptions of graphics
5. Develop skills for writing reports and proposals, and for general purpose and technical writing.

	COURSE OUTCOMES	PROGRAMME OUTCOMES												Ps o1	Ps o2
		1	2	3	4	5	6	7	8	9	10	11	12	Ps o1	Ps o2
1	Use grammatical components effectively in both written and spoken communication	2	1	1	1	1	2	3	2	2	3	3	3	3	3
2	Develop speaking skills for self-introduction, delivering speeches and technical presentation	3	2	2	3	3	3	3	3	2	3	3	3	3	3
3	Speak effectively in real time and business situations	3	3	2	3	3	3	3	3	3	3	3	3	3	3
4	Write email, formal letters and descriptions of graphics	1	1	1	2	2	1	2	2	1	3	1	1	1	1
5	Develop skills for writing reports and proposals, and for general purpose and technical writing.	2	1	1	3	2	2	3	3	3	3	2	3	3	3

UNIT –I

- Parts of speech
- Self-introduction, personal information, name, home background, study details, area of interest, hobbies, strengths and weaknesses, projects and paper presentations, likes and dislikes in food, travel, clothes, special features of home town.

- Instructions, Email, fixing an appointment, cancelling appointments, conference details, hotel accommodation, order for equipment, training programme details, paper submission for seminars and conferences
- Paragraph writing – Describing – defining – providing examples or evidences

UNIT II
- Tenses, active and passive voice
- Welcome address, Vote of Thanks, Special Address on specific topic.
- Letter Writing, Business communication, quotations, placing orders, complaints, replies to queries from business customers, inviting dignitaries, accepting and declining invitations

UNIT – III
- Prefixes and Suffixes
- Mini presentation in small groups of two or three, Office Arrangements, Facilities, Office Functions, Sales, Purchases, Training Recruitment, Advertising, Applying for financial assistance, applying for a job, team work, discussion, presentation.
- Cover letter and resume writing

UNIT - IV
- Modal verbs and probability, concord
- Situational Role Play - between examiner and candidate, teacher and student, customer and sales manager, hotel manager and organiser, team leader and team member, bank manager and candidate, interviewer and applicant, car driver and client, industrialist and candidate, receptionist and appointment seeker, new employee and manager, employee and employee, p.a. and manager, schedule for training
- Proposal: establishing a lab, introducing a subject in the curriculum, training programme for students

UNIT – V
- If conditionals
- Asking for directions, seeking help with office equipment, clarifying an error in the bill, job details, buying a product, selling a product, designing a website, cancelling and fixing appointments, hotel accommodation, training facilities, dress code, conference facilities.
- Technical report writing - feasibility report, accident report, survey report

TOTAL: 30 hours

Speaking test will be conducted for 20 marks externally and evaluated along with Communication Skills in English – I in the End Semester Valuation.

TEXT BOOK:
Technical English I & II, Dr. M. Renuga et al. Sonaversity, 2016

Extensive Reading
1. The Story of Amazon.com- Sara Gilbert, published by Jaico
2. The Story of Google – Sara Gilbert, published by Jaico

Reference
1. Norman Whitby, Business Benchmark – Pre-Intermediate to Intermediate, Students Book, Cambridge University Press, 2006.
2. A Course in Communication Skills, P. Kiranmai Dutt, Geetha Rajeevan, C. L. N. Prakash, published by Cambridge University Press India Pvt. Ltd.

HOD
Humanities and Languages

Dr. M.RENUGA,
Professor & Head,
Department of Humanities & Languages,

Sona College of Technology, Salem   Department of Sciences (Physics)

Course Code: U19PHY103C   L T P C
Course Name: ENGINEERING PHYSICS   3 0 0 3 100

(Common to I Semester B.E. Artificial Intelligence and Data Science, Electronics and Communication Engineering & B.Tech. Information Technology)

(ADS, ECE & IT)

COURSE OUTCOMES:
At the end of the course, the students will be able to,

CO1   Discuss the dual nature of matter and radiation and the application of wave nature of particles.

CO2   Describe the basic components of lasers.

CO3   Analyse the relation between arrangement of atoms and material properties.

CO4   Differentiate the electrical and thermal conductivity of metals.

CO5   Elucidate the classification and theory of semiconducting materials.

CO / PO, PSO Mapping														
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
COs, POs PSOs Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO – 1	3	2	-	-	-	-	-	-	-	-	2	2	-	3
CO – 2	3	2	-	-	-	-	-	-	-	-	2	2	-	3
CO – 3	3	2	-	-	-	-	-	-	-	-	2	2	-	3
CO – 4	3	2	-	-	-	-	-	-	-	-	2	2	-	3
CO - 5	3	2	-	-	-	-	-	-	-	-	2	2	-	3

Unit 1 Quantum Physics   9

Origin of quantum mechanics – Limitations of classical theory - Dual nature of matter and radiation.

Particle nature of radiation - Compton effect - Explanation based on quantum theory - Expression for Compton shift (no derivation).

Wave nature of matter - de Broglie waves - Schrödinger's time independent and time dependent wave equations - Physical significance of wave function - Energy and wave function of an electron trapped in one dimensional box.

Application of wave nature of particles - Electron microscope - Comparison of optical and electron microscope - Scanning electron microscope - Limitations of electron microscope.

Unit 2 Lasers   9

Basic terms - Energy level - normal population - induced absorption (pumping) - population inversion - meta stable state - spontaneous emission - stimulated emission.

Basic components of a laser - Active medium - pumping technique - optical resonator

Einstein's theory - stimulated absorption - spontaneous emission and stimulated emission.

Types of lasers - Solid lasers (Nd:YAG) - Gas lasers (CO_2 laser) - semiconductor laser (homojunction and hetero junction laser).

Holography - Construction and reconstruction of hologram.

Unit 3 Crystal Physics   9

Importance of crystals - Types of crystals - Basic definitions in crystallography (Lattice – space lattice - unit cell - lattice parameters – basis - crystallographic formula) - Seven crystal systems and fourteen Bravais lattices – Lattice planes and Miller indices – Interplanar distance - d spacing in cubic lattice - Calculation of number of atoms per unit cell - Atomic radius - Coordination number and Atomic Packing factor for SC, BCC, FCC and HCP Structures - Polymorphism and allotropy.

Crystal imperfections - Point, line and surface defects – burger vector.

Unit 4 Conducting materials   9

Usage of conducting materials - basic definitions (electrical resistance - conductance - resistivity - conductivity).

Classical free electron theory of metals - Postulates of classical free electron theory - microscopic form of Ohm's law - Electrical conductivity - definition and expression for electrical conductivity - Thermal conductivity - definition and expression for thermal conductivity - Wiedemann - Franz law and Lorentz number - Success and failure of classical free electron theory.

Quantum free electron theory - Drawbacks of quantum free electron theory - origin of energy bands - band theory of solids (qualitative treatment only) - Fermi energy and Fermi distribution function - Effect of temperature on Fermi function - Density of energy states - carrier concentration in metals.

Unit 5 Semiconducting Materials   9

Properties of semiconductors - Classification of semiconductors - Intrinsic and extrinsic semiconductors - Elemental and compound semiconductors.

Intrinsic semiconductor - Two types of charge carriers - Energy band diagram of intrinsic semiconductors (at T= 0 K and T > 0 K) - Expression for number of electrons in conduction band - Expression for number of holes in valence band - Law of mass action and intrinsic carrier concentration - Fermi level - Variation of Fermi level with temperature - electrical conductivity - band gap determination.

Extrinsic semiconductors - Draw backs of intrinsic semiconductors – Types of extrinsic semiconductors – 'n'-type and 'p'-type semiconductors – Energy band diagram of 'n' type and 'p' type semiconductors (at T= 0 K and T > 0 K) – Carrier concentration of extrinsic semiconductors (Qualitative Treatment only) – Hall effect –Determination of Hall coefficient – Applications.
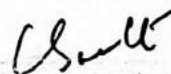
Lecture: 45, Tutorial: 00, Total: 45 Hours

Text Book:

1. M.N.Avadhanulu, 'Engineering Physics' S.Chand & Company Ltd, New Delhi (2015)

2. B. K. Pandey and S. Chaturvedi, Engineering Physics , Cengage Learning India Pvt. Ltd., Delhi, 2019

References:

1. Engineering Physics, Sonaversity, Sona College of Technology, Salem (Revised Edition 2018).

2. Rajendran, V, and Marikani A, 'Materials science' TMH Publications, (2004) New Delhi.

3. Palanisamy P.K, 'Materials science', SciTech Publications (India) Pvt. Ltd., Chennai, Second Edition (2007)

4. D. K. Bhattacharya, Poonam Tandon "Engineering Physics" Oxford University Press 2017.

Dr. C. Shanthi
HOD / Science
Dr. C. SHANTHI, M.Sc.,M.E.,Ph.D.,
Professor of Physics
Head, Department of Sciences
Sona College of Technology (Autonomous)
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U19BEE106A   BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

L T P C
3 0 0 3

(Common to CSE, IT and AI&DS Branches)

Course Outcomes:
At the end of the course, the student will be able to,
1. Analyse the various DC circuits and find the circuit parameters.
2. Describe the principles of AC fundamentals.
3. Discuss the construction and working principle of DC machines and Transformer.
4. Explain the basics of semiconductor devices and its applications.
5. Discuss the various applications of operational amplifier and working principle of UPS.

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	1	1	2	1	-	2	2	2	2	1	1
CO2	2	2	1	1	1	2	1	-	2	2	2	2	1	1
CO3	2	2	1	1	1	2	1	-	2	2	2	2	1	1
CO4	2	2	1	1	1	2	1	-	2	2	2	2	1	1
CO5	2	2	1	1	1	2	1	-	2	2	2	2	1	1

CO / PO, PSO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

UNIT I   DC FUNDAMENTALS   9
Electrical components and parameters – Resistance, Conductance – Ohm's law, limitations of Ohm's law – – Kirchhoff's law – Power – Energy – resistors in series and parallel – comparison of series and parallel circuits – Star-Delta transformation – simple problems.

UNIT II   AC FUNDAMENTALS   9
AC waveforms – standard terminologies – RMS and average value of Sinusoidal, Triangular and Square waveforms – form factor, peak factor – Resistance, Inductance, Capacitance in AC circuits – Impedance – RL, RC, RLC series circuits – series resonance – simple problems.

UNIT III   ELECTRICAL MACHINES   9
DC Generator: construction of DC Machine – working principle of DC Generator – EMF equation – Types of DC Generator.
DC Motor: Working principle of DC Motor – Types of DC Motor.
Transformer: Working principle of Transformer – EMF equation – Transformation ratio.

UNIT IV   SEMICONDUCTOR DEVICES   9
BJT: Operations of NPN and PNP Transistors – Characteristics of Transistors in CE, CB and CC configuration.
Introduction to power semiconductors - SCR, MOSFET – V-I characteristics and applications.

UNIT V   OPERATIONAL AMPLIFIERS AND POWER SUPPLY   9
Operational Amplifier: Ideal characteristics of Op-Amp – Inverting amplifier, Non-Inverting amplifier – voltage follower – summing amplifier.
Rectifiers: working principle of half wave rectifier, full wave rectifier, bridge rectifier.
UPS: components of UPS – working principle of UPS.

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Department of EEE,
Sona College of Technology,
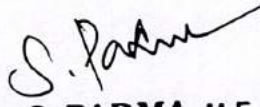SALEM-636 005

TOTAL: 45 Hours

TEXT BOOKS

1. B.L. Theraja, "Fundamentals of Electrical Engineering & Electronics", S. Chand & Co Ltd, 2015.

2. Muthusubramanian R, Salivahanan S, "Basic Electrical and Electronics Engineering", 3rd Edition 2007,Tata McGraw-Hill publishing company limited.

REFERENCES

1. Mehta V.K, Rohit Mehta, "Principles of Electrical Engineering & Electronics", S.Chand& Co. Ltd., 2011.

2. S.K. Bhattacharya, "Electrical Machines", Tata MC Graw Hill Publishing company ltd., III edition, 2009.

3. Smarajit Ghosh, "Fundamentals of Electrical and Electronics Engineering", II revised edition 2010, PHI publications.

4. D. Roy Choudhury and Shail Jain, "Linear Integrated Circuits", First edition, New age international, 2011.

5. S. Padma, "Basic Electrical and Electronics Engineering", Sonaversity, Revised edition 2016.

Dr. S. PADMA, M.E.,Ph.D
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U19PPR105 PROBLEM SOLVING USING PYTHON PROGRAMMING 3 0 0 3
(Common to ADS, IT, CSE, ECE, EEE, BME, MCT, AIML & CSD)

COURSE OUTCOMES

At the end of course, the students will be able to

1. Develop algorithmic solutions to simple computational problems
2. Write simple Python programs
3. Write programs with the various control statements and handling strings in Python
4. Develop Python programs using functions and files
5. Analyze a problem and use appropriate data structures to solve it.

	CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak													
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	3	1	1	2	2	1	3	3	3
CO2	3	3	3	3	3	2	1	1	1	1	1	3	3	3
CO3	3	3	3	3	3	3	2	1	1	1	1	3	3	3
CO4	3	3	3	3	3	2	2	1	1	2	1	3	3	3
CO5	3	3	3	3	3	3	3	1	1	1	1	3	3	3

UNIT I -   ALGORITHMIC PROBLEM SOLVING   9

Need for computer languages, Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion).

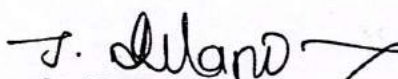## UNIT II -   BASICS OF PYTHON PROGRAMMING   9

Introduction-Python Interpreter-Interactive and script mode -Values and types, variables, operators, expressions, statements, precedence of operators, Multiple assignments, comments, input function, print function, Formatting numbers and strings, implicit/explicit type conversion.

UNIT III -   CONTROL STATEMENTS AND STRINGS   9

Conditional (if), alternative (if-else), chained conditional (if-elif-else). Iteration-while, for, infinite loop, break, continue, pass, else. Strings-String slices, immutability, string methods and operations.

UNIT IV -   FUNCTIONS AND FILES   9

Functions - Introduction, inbuilt functions, user defined functions, passing parameters - positional arguments, default arguments, keyword arguments, return values, local scope, global scope and recursion. Files -Text files, reading and writing files.

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PROFESSOR & HEAD
Department of Information Technology
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UNIT V - DATA STRUCTURES: LISTS, SETS, TUPLES, DICTIONARIES   9

Lists-creating lists, list operations, list methods, mutability list functions, searching and sorting, Sets-creating sets, set operations. Tuples-Tuple assignment, Operations on Tuples, lists and tuples, Tuple as return value- Dictionaries-operations and methods, Nested Dictionaries.

TOTAL: 45 HOURS

TEXT BOOK

1. Reema Thareja, "Problem Solving and Programming with Python", Oxford University Press, 2018.
2. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016 (http://greenteapress.com/wp/think- python/)

REFERENCES

1. Ashok Namdev Kamthane, Amit Ashok Kamthane, "Programming and Problem Solving with Python", Mc-Graw Hill Education, 2018.
2. Robert Sedgewick, Kevin Wayne, Robert Dondero, "Introduction to Programming in Python: An Inter-disciplinary Approach", Pearson India Education Services Pvt. Ltd., 2016.
3. Timothy A. Budd," Exploring Python", Mc-Graw Hill Education (India) Private Ltd., 2015.
4. Kenneth A. Lambert, "Fundamentals of Python: First Programs", CENGAGE Learning, 2012.
5. Charles Dierbach, "Introduction to Computer Science using Python: A Computational Problem Solving Focus", Wiley India Edition, 2013.

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Department of Information Technology
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SALEM - 636 005

U19PHL110	ENGINEERING PHYSICS LABORATORY [Common to IT & ADS]	L	T	P	C
		0	0	3	1.5

	Course Outcomes
	After successful completion of this course, the students should be able to
CO1:	Apply the principles of Thermal Physics and Elasticity to determine the Engineering properties of materials.
CO2:	Apply the principles of Optics and Electricity to determine the Engineering properties of materials.
CO3:	Determine the thickness and resistivitiy of the given copper turn used for house hold applications.

Pre-requisite: Capable of using Screw gauge, Vernier calliper, Travelling microscope and Spectrometer

CO/PO, PSO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO 1	3			1		1					1			2
CO 2	3			1		1					1			2
CO 3	3			1		1					1			2

Course Assessment methods

Direct		Indirect
Mean of 1st half of Experiment (10)	Quiz on 2nd half (5)	Course end survey
Quiz on 1st half (5)	Internal test II (10)	
Internal test I (10)	RTPS (10)	
Mean of 2nd half of Experiment (10)	End semester Examination (40)	

	List of Experiments
1	Determination of velocity of ultrasonic waves and compressibility of the given liquid using ultrasonic interferometer.
2	Determination of Young's modulus of the material of the beam by Non-uniform bending method.
3	Determination of the thermal conductivity of a bad conductor using Lee's Disc apparatus.
4	Determination of specific resistance of a given wire using Carey Foster's bridge.
5	Determination of Rigidity Modulus of given wire using Torsion Pendulum.
6	Determination of coefficient of viscosity of liquid by Poiseuille's method.
7	Determination of Young's modulus of the material of the beam by uniform bending method.
8	Determination of laser wavelength using diode laser.
9	Determination of particle size of lycopodium powder using diode laser.
10	Determination of acceptance angle and numerical aperture of an optical fibre using diode laser.
11	Determination of the thickness of a thin wire by forming interference fringes using air wedge apparatus.
12	Determination of dispersive power of the prism for various pairs of colors in the mercury spectrum using a spectrometer.
13	Determination of Wavelength of Mercury spectrum using spectrometer.
14	Determination of band gap of the given semiconductor diode.
	Total Hours: 45 Hrs

Dr. C. Shanthi
HOD / Sciences

Dr. C. SHANTHI, M.Sc.,M.E.,Ph.D.,
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U19BEEL113A   BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY

L	T	P	C
0	0	2	1

(Common to CSE, IT and AI&DS Branches)

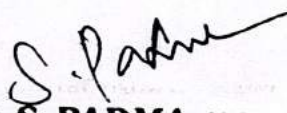**Course Outcomes:** At the end of the course, the students will be able to,

1. Apply the basic circuit laws for calculating various parameters of DC and AC circuits
2. Design the circuit for various applications using electronic devices.
3. Analysis the performance characteristics of electronic devices such as SCR, MOSFET, BJT and op-amp.

	CO / PO, PSO Mapping													
	(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak													
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	2	2	1	1	1	2	2	2	2	1	1
CO2	2	2	2	2	2	1	1	1	2	2	2	2	1	1
CO3	2	2	2	2	2	1	1	1	2	2	2	2	1	1

List of experiments

1. Verification of Ohm's Law.
2. Verification of Kirchhoff's Law.
3. Measurement of power and power factor for RLC circuit.
4. Frequency response of RLC resonance circuit.
5. V-I characteristics of BJT in CB configuration.
6. V-I characteristics of BJT in CE configuration.
7. V-I characteristics of BJT in CC configuration.
8. V-I characteristics of MOSFET.
9. V-I characteristics of SCR.
10. Characteristics of operational amplifier as inverting and non-inverting amplifiers.
11. Measurement of ripple factor for half wave and full wave rectifier circuits.

Total: 30 Hours

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(Common to ADS, IT, CSE, ECE, EEE, BME, MCT, AIML & CSD)

COURSE OUTCOMES

At the end of course, the students will be able to

1. Implement the algorithms using basic control structures in Python
2. Develop Python programs to use functions, strings and data structures to solve different types of problems
3. Implement persistent storing information through file operations

COs	CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	3	2	1		1	2	2	1	2	3	3
CO2	3	3	3	3	2	2		1	2	2	1	2	3	3
CO3	3	3	3	3	2	2		1	2	2	1	3	3	3

LIST OF EXPERIMENTS

1. Draw flowchart using any open source software.

2. Implement programs with simple language features.

3. Implement various branching statements in python.

4. Implement various looping statements in python.

5. Develop python programs to perform various string operations like concatenation, slicing, indexing.

6. Implement user defined functions using python.

7. Implement recursion using python.

8. Develop python programs to perform operations on list and tuples

9. Implement dictionary and set in python

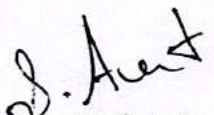10. Implement python program to perform file operations.

TOTAL: 30 HOURS

Dr. J. AKILANDESWARI
PROFESSOR & HEAD
Department of Information Technology

Semester-I U19GE101	Basic Aptitude – I (Common to All Departments)	L	T	P	C	Marks
		0	0	2	0	100

Course Outcomes

U19GE101

At the end of the course the student will be able to:

1. Solve fundamental problems in specific areas of quantitative aptitude
2. Solve basic problems in stated areas of logical reasoning
3. Demonstrate rudimentary verbal aptitude skills in English with regard to specific topics

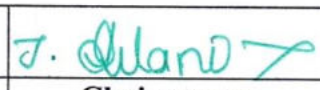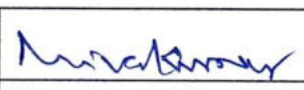|	
1.Quantitative Aptitude and Logical Reasoning	Solving simple problems with reference to the following topics: a. Numbers – HCF & LCM b. Decimal fractions c. Simplification d. Square roots & cube roots e. Surds & indices f. Ratio and proportion g. Averages h. Area and volume i. Coding and decoding & artificial language
2. Verbal Aptitude	Demonstrating plain English language skills with reference to the following topics: a. Synonyms b. Antonyms c. Verbal analogy d. Editing passages e. Sentence filler words

30 hours

S. Anita

Dr.S.Anita
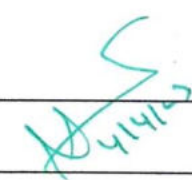
Head/Training

Department of Placement Training
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Salem-636 005.

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Sona College of Technology, Salem – 636 005
(An Autonomous Institution)
Courses of Study for BE / B Tech Semester II under Regulations 2019 (CBCS)
Branch: Information Technology

S.No	Course Code	Course Title	L	T	P	C	Category	Total Contact Hours
		Theory						
1	U19TAM201	தமிழர் மரபு / Heritage of Tamils	1	0	0	1	HSMC	15
2	U19MAT202D	Applied Probability and Statistics	3	1	0	4	BSC	60
3	U19ENG201C	Communication Skills in English-II	2	0	2	3	HSMC	60 (30L+30P)
4	U19CHE204B	Applied Chemistry	3	0	0	3	BSC	45
5	U19EGR206A	Engineering Graphics	2	0	2	3	ESC	60 (30L+30P)
6	U19IT201	Programming in C	3	0	0	3	PCC	45
7	U19IT202	Information Technology Essentials	2	0	0	2	ESC	30
		Practical						
8	U19IT203	Programming in C Laboratory	0	0	3	1.5	PCC	45
9	U19CHL209	Engineering Chemistry Laboratory	0	0	3	1.5	BSC	45
10	U19GE201	Basic Aptitude – II	0	0	2	0	EEC	30
		Total Credits				22		
		Optional Language Elective*						
11	U19OLE1201	French						
12	U19OLE1202	German	0	0	2	1	HSMC	30
13	U19OLE1203	Japanese						

*Students may opt for foreign languages viz., German/French/Japanese with additional one credit (Not accounted for CGPA calculation)

Approved by

Chairperson, Science and Humanities BoS	Chairperson, Information Technology BoS	Member Secretary, Academic Council	Chairperson, Academic Council & Principal
Dr. M. Renuga	Dr. J. Akilandeswari	Dr. R. Shivakumar	Dr. S. R. R. Senthil Kumar

Copy to:-HOD/ Information Technology, Second Semester BE IT Students and Staff, COE

U19TAM201	HERITAGE OF TAMILS	LT P C

1 0 0 1

UNIT I   LANGUAGE AND LITERATURE   **3**

Language Families in India - Dravidian Languages – Tamil as a Classical Language - Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature - Management Principles in Thirukural - Tamil Epics and Impact of Buddhism & Jainism in Tamil Land - Bakthi Literature Azhwars and Nayanmars - Forms of minor Poetry - Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan.

UNIT II   HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE   3

Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.

UNIT III   FOLK AND MARTIAL ARTS   **3**

Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.

UNIT IV   THINAI CONCEPT OF TAMILS   **3**

Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.

**UNIT V   CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN
                CULTURE**   **3**

Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts – Print History of Tamil Books.

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS

1. தமிழக வரலாறு – மக்களும் பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் – முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருநை – ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
9. Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

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அலகு I　　மொழி மற்றும் இலக்கியம்:　　　　　3

இந்திய மொழிக் குடும்பங்கள் – திராவிட மொழிகள் – தமிழ் ஒரு செம்மொழி – தமிழ் செவ்விலக்கியங்கள் – சங்க இலக்கியத்தின் சமயச் சார்பற்ற தன்மை – சங்க இலக்கியத்தில் பகிர்தல் அறம் – திருக்குறளில் மேலாண்மைக் கருத்துக்கள் – தமிழ்க் காப்பியங்கள், தமிழகத்தில் சமண பௌத்த சமயங்களின் தாக்கம் – பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் – சிற்றிலக்கியங்கள் – தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி – தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

அலகு II　　மரபு – பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை – சிற்பக் கலை:　　　　　3

நடுகல் முதல் நவீன சிற்பங்கள் வரை – ஐம்பொன் சிலைகள்– பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் – தேர் செய்யும் கலை – சுடுமண் சிற்பங்கள் – நாட்டுப்புறத் தெய்வங்கள் – குமரிமுனையில் திருவள்ளுவர் சிலை – இசைக் கருவிகள் – மிருதங்கம், பறை, வீணை, யாழ், நாதஸ்வரம் – தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு.

அலகு III　　நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள்:　　　　　3

தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஒயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.

அலகு IV　　தமிழர்களின் திணைக் கோட்பாடுகள்:　　　　　3

தமிழகத்தின் தாவரங்களும், விலங்குகளும் – தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் – தமிழர்கள் போற்றிய அறக்கோட்பாடு – சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும் – சங்ககால நகரங்களும் துறை முகங்களும் – சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி – கடல்கடந்த நாடுகளில் சோழர்களின் வெற்றி.

அலகு V　　இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு:　　　　　3

இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு – இந்தியாவின் பிறபகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் – சுயமரியாதை இயக்கம் – இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு – கல்வெட்டுகள், கையெழுத்துப்படிகள் – தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS

1.　தமிழக வரலாறு – மக்களும் பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).

2.　கணினித் தமிழ் – முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).

3.　கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)

4.　பொருநை – ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)

5.　Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)

6.　Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.

7.　Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).

8.　The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)

9.　Keeladi - 'Sangam City C ivilization on the banks of river Vaigai' (Jointly Published by: Department ofArchaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

10.　Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)

11.　Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

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B. TECH. / INFORMATION TECHNOLOGY

SEMESTER – II	APPLIED PROBABILITY AND STATISTICS	L	T	P	C
U19MAT202D		3	1	0	4

COURSE OUTCOMES

At the end of the course, the students will be able to

1. apply the concepts of measure of central tendency, dispersion, correlation to the given data and analyze the results.
2. apply the concepts of random variables and their properties to generate the moments.
3. fit the suitable distribution and its properties to the real world problems and interpret the results.
4. apply the concepts of joint probability distribution and its properties to find the covariance.
5. test the hypothesis of the population using sample information.

	CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3		3	2							2		2
CO2	3	3		3	2							2		2
CO3	3	3		3	2							2		2
CO4	3	3		3	2							2		2
CO5	3	3		3	2							2		2

UNIT – I   BASIC STATISTICS   12

Measures of central tendency (simple arithmetic mean, median, mode) – Quartile's – Measures of dispersion (range, inter-quartile range, quartile deviation, mean deviation, standard deviation, coefficient of variation) – Simple correlation – Curve fitting (straight line and parabola).

UNIT – II   RANDOM VARIABLES   12

Discrete and continuous random variables – Probability mass function, probability density function, moments, moment generating function and their properties.

UNIT – III   STANDARD DISTRIBUTIONS   12

Binomial, Poisson, geometric, uniform, exponential and normal distributions and their properties.

UNIT – IV   TWO DIMENSIONAL RANDOM VARIABLES   12

Joint distributions, marginal and conditional distributions – Covariance – Correlation – Central limit theorem.

UNIT – V   TESTING OF HYPOTHESIS   12

Sampling distributions – testing of hypothesis for proportion, mean, standard deviation and differences using normal distribution– t-test for single mean and difference between means - χ^2- tests for independence of attributes and goodness of fit and F-test for equality of two variances.

Theory: 45 Hours   Tutorial: 15 Hours   Total: 60 Hours

TEXT BOOKS:

1. S. C. Gupta, V. K. Kapoor, "Fundamentals of Mathematical Statistics", Sultan Chand and Sons, 11th Edition, Reprint, 2019.
2. T. Veerarajan, "Probability, Statistics and Random Processes with Queueing Theory and Queueing Networks", McGraw Hill Publishers, 4th Edition, 7th Reprint, 2018.
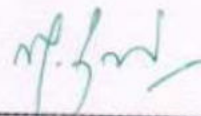
REFERENCE BOOKS:

1. R. A. Johnson and C. B. Gupta, "Miller and Freund's, Probability and Statistics for Engineers", Pearson Publishers, 9th Edition, 2018.
2. S. Ross, "A first course in probability", Pearson Publishers, 9th Edition, 2019.
3. P. G. Hoel, S. C. Port and C. J. Stone, "Introduction to Probability Theory", Universal Book Stall Publishers, Reprint, 2003.
4. W. Feller, "An Introduction to Probability Theory and its Applications", Vol. 1, 3rd Edition, Wiley Publishers, 2008.

Prof. S. JAYABHARATHI
Head / Department of Mathematics
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Dr. M. RENUGA
BoS - Chairperson
Science and Humanities
Sona College of Technology
Salem – 636 005

10. 05. 2019

B. E. / B. Tech. Regulations 2019

U19ENG201C - Communication Skills in English - II
First year II semester
IT

Course Outcomes: At the end of course, the students will be able to

1. Frame sentences correctly, both in written and spoken forms of language with accuracy and fluency.
2. Develop and demonstrate listening skills for academic and professional purposes.
3. Draw conclusions on explicit and implicit oral information.
4. Develop effective reading skills and reinforce language skills required for using grammar and building vocabulary.
5. Read for gathering and understanding information, following directions and giving responses.

	COURSE OUTCOMES	PROGRAMME OUTCOMES												Ps o1	Ps o2
		1	2	3	4	5	6	7	8	9	10	11	12		
1	Frame sentences correctly, both in written and spoken forms of language with accuracy and fluency.	1	1	3	3	3	3	2	3	3	3	3	3	3	3
2	Develop and demonstrate listening skills for academic and professional purposes	1	2	2	3	3	2	2	2	3	3	2	3	3	3
3	Draw conclusions on explicit and implicit oral information	2	2	2	1	2	2	3	3	3	3	2	3	3	3
4	Develop effective reading skills and reinforce language skills required for using grammar and building vocabulary	2	2	3	3	2	3	3	3	3	3	3	3	3	3
5	Read for gathering and understanding information, following directions and giving responses	2	2	2	3	2	3	3	3	3	3	3	3	3	3

UNIT –I   12

- Cause and effect expressions, adjectives, comparative adjectives
- Listening to conversations, welcome speeches, lectures and description of equipment
- Listening to different kinds of interviews (face-to-face, radio, TV and telephone interviews)
- Understanding notices, messages, timetables, advertisements, graphs, etc.
- Reading passages for specific information transfer

UNIT – II   12

- Prepositions and dependent prepositions
- Understanding short conversations or monologues,
- Taking down phone messages, orders, notes etc
- Listening for gist, identifying topic, context or function
- Reading documents for business and general contexts and interpreting graphical representations

UNIT – III   12

- Collocations
- Listening comprehension, entering information in tabular form
- Error correction, editing mistakes in grammar, vocabulary, spelling, etc.
- Reading passage with multiple choice questions, reading for gist and reading for specific information, skimming for comprehending the general idea and meaning and contents of the whole text

UNIT – IV   12

- Articles, adverbs
- Intensive listening exercises and completing the steps of a process.
- Listening exercises to categorise data in tables.
- Short reading passage: gap-filling exercise related to grammar, testing the understanding of prepositions, articles, auxiliary verbs, modal verbs, pronouns, relative pronouns and adverbs, short reading passage with multiple choice questions.

UNIT – V   12

- Pronouns
- Listening to extended speech for detail and inference
- Listening and developing hints
- gap-filling exercise testing the knowledge of vocabulary, collocations, dependent prepositions, grammatical structures
- Short reading passages for sentence matching exercises, picking out specific information in a short text

(Theory: 30 hours: Practical: 30 hours) TOTAL: 60 hours

The listening test will be conducted for 20 marks and reading for 20 marks internally and evaluated along with Communication Skills in English –II in the End Semester Valuation.

Textbook:
1. Technical English I & II, Dr. M. Renuga et al. Sonaversity, 2016

Extensive Reading
1. Who Moved my Cheese? – Spencer Johnson-G. P. Putnam's Sons
2. Discover the Diamond in You – Arindham Chaudhari – Vikas Publishing House Pvt. Ltd.

Reference
1. Norman Whitby, Business Benchmark – Pre-Intermediate to Intermediate, Students Book, Cambridge University Press, 2006.
2. A Course in Communication Skills, P. Kiranmai Dutt, Geetha Rajeevan, C. L. N. Prakash, published by

HOD

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II SEMESTER (IT)

COURSE CODE	**U19CHE204B**		**L T P C**
COURSE NAME	**APPLIED CHEMISTRY**		**3 0 0 3**

Course outcome:

At the end of the course the students will be able to

CO1 Outline the principles and applications of electrochemistry to engineering and technology.

CO2 Analyze the types of corrosion and describe the methods of corrosion control.

CO3 Discuss the principle, applications of surface chemistry and catalysis in engineering and technology.

CO4 Describe the basics of nano chemistry, synthesis, properties and applications of nano materials in engineering and technology.

CO5 Analyze the types of polymers, methods of polymerization and methods of fabrication.

CO / PO, PSO Mapping														
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
COs, POs PSOs Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO – 1	3	2												2
CO – 2	3	2												2
CO – 3	3	2												2
CO – 4	3	2												2
CO - 5	3	2												2

UNIT I ELECTROCHEMISTRY   9

Conductivity of Electrolytes – Kohlrausch's Law of Independent Migration of Ions and Its Applications – Conductometric Titration (Acid-Base – HCl vs NaOH) – Electrode Potential – Nernst Equation – Derivation and Problems Based on Single Electrode Potential Calculation – Electrochemical Series – Significance – Reference Electrodes - Standard Hydrogen Electrode, Saturated Calomel electrode – Ion selective electrode - glass electrode - determination of pH for unknown solution – Electrochemical Cell – Emf of an Electrochemical Cell – Redox Reactions - Potentiometric Titrations (Redox – Fe^{2+} Vs Dichromate).

UNIT II CORROSION AND ITS CONTROL   9

Dry or Chemical Corrosion - Pilling-Bedworth Rule – Wet or Electrochemical Corrosion – Mechanism of Electrochemical Corrosion – Galvanic Corrosion – Differential aeration Corrosion - Factors Influencing Corrosion – Corrosion Control - Cathodic Protection - Sacrificial Anodic Protection Method and Impressed Current Cathodic Protection – Protective

Coatings – Metallic Coatings – Galvanizing process – Tinning process - Organic Coatings – Paints - Constituents and Functions.

UNIT III SURFACE CHEMISTRY AND CATALYSIS   9

Adsorption – types - Physical and chemical adsorption – adsorption of gases on solids - Adsorption isotherms - Freundlich and Langmuir isotherms - Adsorption of solutes from solution – Applications of adsorption - Role of adsorption in catalytic reactions – Adsorption in pollution abatement (granular activated carbon and powdered activated carbon) – - Catalysis - Types - Characteristics of catalysts - Autocatalysis - Definition and examples – catalytic promoters – catalytic poisons.

UNIT IV NANOCHEMISTRY   9

Basics - Distinction between molecules, nanoparticles and bulk materials – Size-dependent properties – Nanoparticles: nano cluster, nano rod, nanotube (CNT) and nanowire – Synthesis: Precipitation – Thermolysis – Hydrothermal – Solvothermal – Electrodeposition - Chemical vapour deposition - Sol-gel technique – Properties and applications of nano materials.

UNIT V   POLYMERS AND COMPOSITES   9

Nomenclature of Polymers – Functionality – Types of Polymerization-Addition-Condensation and Copolymerization – Classification of Polymers – Free Radical mechanism of Addition Polymerization – Properties of Polymers - Glass transition temperature – Tacticity - Methods of Polymerization – Bulk, solution, emulsion and suspension – Thermoplastic and Thermosetting Resins – Plastics – Moulding Constituents of Plastic – Moulding of Plastics into Articles-Injection - Compression and Blow Moulding – Composites - Constituents of Composites – Types of FRP Composites.

TOTAL : 45 HOURS

Text Books:

1. P. C. Jain and Monica Jain, "Engineering Chemistry" Dhanpat Rai Pub, Co., New Delhi,   2010 (15th Edition).

2. G. Shanthi et al., "Applied Chemistry", Sonaversity, Sona College of Technology, Salem, 2019.

Reference Books:
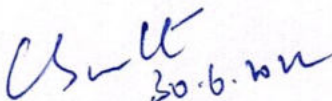
1. H. K. Chopra, A. Parmer, "Chemistry for Engineers", Narosa Publishing House, New Delhi, 110 002, 2016.

2. Kannan P., Ravikrishnan A., "Engineering Chemistry", Sri Krishna Hi-tech Publishing   Company Pvt. Ltd., Chennai, 2009.

3. B. Sivasankar "Engineering Chemistry" Tata McGraw-Hill Pub.Co.Ltd, New Delhi, 2008.

30.06.2022

30.6.2022

B.E. / B.Tech. Regulations 2019
Dr. C. SHANTHI, M.Sc.,M.E.,Ph.D.,
Professor of Physics
Head, Department of Sciences
Sona College of Technology (Autonomous)
SALEM-63.

4. Ozin G. A. and Arsenault A. C., "Nanochemistry: A Chemical Approach to Nanomaterials", RSC Publishing, 2005.

Dr. C. Shanthi
HOD / Sciences

U19EGR206A – ENGINEERING GRAPHICS

L T P C
2 0 2 3

Course Outcomes: Upon completion of this course the students will be able to

CO1   Predict the construction of various curves in civil elevation, plan and machine components.

CO2   Analyze the principles of projection of various planes by different angle to project points, lines and planes.

CO3   Draw the principles of projection of simple solid by the axis is inclined to one reference plane by change of position method.

CO4   Understand the interior details of complex components, machineries by sectioning the solid body. Study the development of surfaces for prisms and pyramids.

CO5   Draw the projection of three dimensional objects representation of machine structure and explain standards of orthographic views by different methods.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
COs, POs PSOs Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	3	2	2	1	1	1	1	1	3	2	2	3	2	2
CO 2	3	2	2	1	2	1	1	1	3	2	2	3	2	2
CO 3	3	2	2	1	2	1	1	1	3	2	2	3	2	2
CO 4	3	2	2	1	2	1	1	1	3	2	2	3	2	2
CO 5	3	2	2	1	1	1	1	1	3	2	2	3	2	2

UNIT I – PLANE CURVES (Manual drafting)   06

Curves used in engineering practices Conics – Construction of ellipse – Parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the above curves.

UNIT II – PROJECTION OF POINTS, LINES AND PLANE SURFACES (CAD software)   12

Projection of points – Projection of straight lines located in the first quadrant – Determination of true lengths and true inclinations – Projection of polygonal surface and circular lamina inclined to one reference planes.

UNIT III – PROJECTION OF SOLIDS (CAD software)   12

Creation of 3D CAD models of pyramids, prisms and solids of revolutions-Sectional views - **(Not for Examination)**

Projection of simple solids like prisms – pyramids – cylinder and cone when the axis is inclined to one reference plane by change of position method.

UNIT IV – SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES (CAD software)   12

Sectioning of simple solids like prisms – pyramids, cylinder and cone in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other, (Obtaining true shape of section is not required). Development of lateral surfaces of simple and truncated solids – Prisms – pyramids –cylinders and cones.

UNIT V – Conversion of Isometric Views to Orthographic Views (Manual drafting)
12

Representation of three dimensional objects – General Principles of Orthographic projection – Need for importance of multiple views and their placement – First angle projection – layout of views – Developing visualization skills through free hand sketching of multiple views from pictorial views of objects.

TOTAL: 60 Hours

TEXT BOOKS

1. P. Suresh et al., "Engineering Graphics and Drawing", Sonaversity, Sona College of Technology, Salem, Revised edition, 2012.
2. K.V. Natarajan Engineering Graphics by, Chennai, 17th edition 2003.

REFERENCES

1. Dhananjay A. Jolhe, Engineering Drawing with an introduction to AutoCAD, Tata McGraw Hill Publishing Company Limited, 2008.
2. Basant Agarwal and Agarwal C.M., Engineering Drawing, Tata McGraw Hill Publishing Company Limited, New Delhi, 2008.
3. K. R. Gopalakrishnana, Engineering Drawing (Vol. I & II), Subhas Publications, 1998.
4. Bertoline & Wiebe fundamentals of graphics communication III edition McGrawhill 2002

Dr. D. SENTHIL KUMAR, M.E.,Ph.D
PROFESSOR & HEAD
DEPT. OF MECHANICAL ENGG.
SONA COLLEGE OF TECHNOLOGY
JUNCTION MAIN ROAD, SALEM-5.

COURSE OUTCOMES

At the end of the course, the students will be able to

1. Write simple C programs
2. Apply the concepts such as arrays, decision making and looping statements to solve real-time problems
3. Develop C programs using functions and pointers
4. Write a C programs to define own data types using the concept of structures and union
5. Write a C program to store the information persistently using file concepts

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2					3		3	1				3
CO2	3	2					3		3	1		1		3
CO3	3	2	1				3		3	2	2	1		3
CO4	3	2	1				3		3	2	2	1		3
CO5	3	2	1				3		3	2	2	1		3

UNIT I -   **C PROGRAMMING BASICS**   **9**

Structure of a C program – Compiling and Debugging a C program - C Character set, Identifiers and Keywords, Data Types, Declarations, Expressions, Statements and Symbolic constants, Operators – Arithmetic Operators – Unary operators – Relational and Logical Operators – Assignment operators – Conditional operators. Managing Input and Output operations, pre-processor directives and storage classes.

UNIT II -   **CONTROL STATEMENTS, ARRAYS AND STRINGS**   **9**

Unconditional statements, conditional statements, branching and looping statements - Arrays – Initialization – Declaration – One dimensional and Two dimensional arrays. String- String operations – String Arrays. Simple programs- sorting- searching – matrix operations.

UNIT III -   **FUNCTIONS AND POINTERS**   **9**

Function – Library functions and user-defined functions – Function prototypes and function definitions – Call by value – Call by reference – Recursion – Pointers - Definition – Initialization – Pointers arithmetic – Pointers and arrays- Example Problems – Pointers and Functions

UNIT IV -   **STRUCTURES AND UNIONS**   **9**

Introduction – need for structure data type – structure definition – Structure declaration - Structure within a structure – Passing structures to functions – Array of structures – Pointers to structures – Union - Programs using structures and Unions – Dynamic Memory Allocation: malloc and calloc

Dr. J. AKILANDESWARI
PROFESSOR & HEAD
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SONA COLLEGE OF TECHNOLOGY
S A L E M - 636 005

File Manipulations- File operations – Open, Read, Write and Close, Binary files and text files, Input and outout file redirection – Stdin and Stdout and Command line arguments.
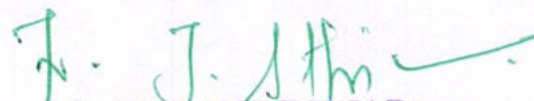
TOTAL: 45 HOURS

TEXTBOOKS

1. Deitel P and Deitel H, "C How to Program", Pearson Education, New Delhi, 2016.
2. Venugopal KR and Sudeep R Prasad, "Mastering C", McGraw Hill, Second edition, 2017.

REFERENCES

1. Byron S Gottfried, "Programming with C", Schaums Outlines, Second Edition, Tata McGraw-Hill, 2017.
2. Yashavant P. Kanetkar, "Let Us C", 15th Edition, BPB Publications, 2016.
3. Balagurusamy E, "Programming in ANSI C", sixth edition, Tata Mcgraw- Hill, 2012.
4. Kernighan, B.W and Ritchie, D.M, "The C Programming language", Second Edition, Pearson Education, 2006.

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COURSE OUTCOMES

At the end of the course, the students will be able to

1. Create a web pages using HTML and CSS
2. Explain the basics of networking and its working principles in real world
3. Explain the working principles of mobile communication
4. Perform installation and configuration of operating system, and drivers
5. Explain the basics of Machine Learning, Cloud Computing and IoT

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	3	3									3	2
CO2	2	2	2	2	2							1	2	2
CO3	2	2	2	2	2							1	2	2
CO4		2	2	2	2							1	2	
CO5	2	2	2	2	2								2	2

UNIT I -   **WEB ESSENTIALS**   6

Creating a Website - Working principle of a Website - Browser fundamentals - Authoring tools - Types of servers: Application Server - Web Server - Database Server.

UNIT II -   **NETWORKING ESSENTIALS**   6

Fundamental computer network concepts - Types of computer networks - - Network layers - TCP/IP model - Wireless Local Area Network - Ethernet - WiFi - Network Routing - Switching - Network components.

UNIT III -   **MOBILE COMMUNICATION ESSENTIALS**   6

Cell phone working fundamentals - Cell phone frequencies & channels - Digital cell phone components - Generations of cellular networks - Cell phone network technologies / architecture - Voice calls & SMS

UNIT IV -   **INSTALLATION AND CONFIGURATION OF PC**   6

Configuration of BIOS - Installing Operating System (Open Source and Proprietary) – Driver installation – Network Configuration – Disk Configuration

UNIT V -   **RECENT TRENDS IN IT**   6

Introduction to Machine Learning - Application of Machine Learning – Introduction to Cloud Computing – Types of Cloud services – IoT and its applications

TOTAL: 30 HOURS

TEXTBOOKS

1. Laura Lemay, Rafe Colburn, Jennifer Kyrnin, "Mastering HTML, CSS and Java Script", BPB Publications, 2017.
2. James F. Kurose, —Computer Networking: A Top-Down Approach‖, Sixth Edition, Pearson, 2017.

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REFERENCES

1. Gottapu Sasibhushana Rao, "Mobile Cellular Communication", Pearson, 2012.
2. Nathan Clark," Linux: installation, configuration and command line basics", Independent Publisher, 2018.
3. R. Kelly Rainer, Casey G. Cegielski, Brad Prince, Introduction to Information Systems, Fifth Edition, Wiley Publication, 2014.

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U19IT203   PROGRAMMING IN C LABORATORY   0 0 3 1.5

COURSE OUTCOMES
At the end of the course, the students will be able to

1. Develop programs in C using basic constructs.

2. Develop applications in C using strings, pointers, functions, structures

3. Develop applications in C using file processing

	CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak													
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2				3		3	2	2	1	1	3
CO2	3	3	2				3		2	2	2	1	1	3
CO3	3	3	2				3		3	2	1	1	1	3

LIST OF EXPERIMENTS

1. Programs using Input, Output and assignment statements

2. Programs using Branching statements

3. Programs using Looping statements

4. Programs using Functions

5. Programs using one dimensional and two dimensional arrays

6. Programs using Structures and Unions.

7. Programs using Strings

8. Programs using Pointers (both data pointers and function pointers)

9. Programs using Recursion

10. Programs using Command line arguments

11. Programs using Files concepts

12. Programs using Dynamic Memory Allocation

TOTAL: 45 HOURS

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U19CHL209	ENGINEERING CHEMISTRY LABORATORY (For IT)	L	T	P	C
		0	0	3	1.5

	Course Outcomes
	After successful completion of this course, the students should be able to
CO1:	Analyse the given water sample to determine the amount of hardness and alkalinity.
CO2:	Determine the molecular weight of various polymers, analyse the quality of brass by estimating copper and estimate the amount of calcium oxide in the given cement sample. Calculate the amount of chromium present in the given sample of water,
CO3:	Estimate the amount of DO in water and evaluate the amount of iron content in the given sample using spectrophotometry

CO/PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

Programme Outcomes (POs) and Programme Specific Outcome (PSOs)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3			1		1				1				2
CO2	3			1		1				1				2
CO3	3			1		1				1				2

Course Assessment methods

Direct		**Indirect**
Mean of 1st half of Experiment (10)	Quiz on 2nd half (5)	Course end survey
Quiz on 1st half (5)	Internal test II (10)	
Internal test I (10)	RTPS (10)	
Mean of 2nd half of Experiment (10)	End semester Examination (40)	

List of Experiments (Chemistry part)	
1	Estimation of hardness of water sample by EDTA method.
2	Estimation of alkalinity of water sample by indicator method.
3	Estimation of copper in brass by EDTA method.
4	Estimation of chloride ion present in the sample water by argentometric method.
5	Estimation of HCl by pH metry.
6	Determination of iron content in water by spectrophotometric method.
7	Estimation of HCl by conductometry. (HCl vs NaOH)
8	Estimation of mixture of acids by conductometry. ($HCl + CH_3COOH$ vs NaOH)
9	Estimation of ferrous ion by potentiometric titration.
10	Determination of Molecular weight of a polymer by viscosity measurements.
11	Determination of Dissolved Oxygen of water by Winkler's method.
12	Estimation of chromium in waste water.
	Total Hours: 45 Hrs
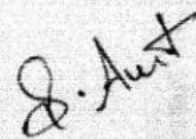
30-6-2022

Dr. C. Shanthi
HOD / Sciences

Semester-II	Basic Aptitude – II - U19GE201 (Common to All Departments)	L	T	P	C	Marks
		0	0	2	0	100

Course Outcomes

At the end of the course the student will be able to:

1. Solve more elaborate problems than those in BA-I* in specific areas of quantitative aptitude
2. Solve problems of greater intricacy than those in BA-I in stated areas of logical reasoning
3. Demonstrate higher than BA-I level verbal aptitude skills in English with regard to specific topics

1.Quantitative Aptitude and Logical Reasoning	Solving quantitative aptitude and logical reasoning problems with reference to the following topics: a. Profit & loss b. Partnership c. Chain rule d. Numbers e. Ages f. Percentages g. Logarithms h. Geometry i. Direction sense j. Symbols and series
2.. Verbal Aptitude	Demonstrating verbal aptitude skills in English with reference to the following topics: a. Jumbled sentences b. Reconstructions of sentences (PQRS) c. Sentence fillers two words d. Idioms and phrases e. Spotting errors f. Writing captions for given pictures

Dr.S.Anita

Head/Training

Dr. S. ANITA
Professor and Head
Department of Training,
SONA COLLEGE OF TECHNOLOGY,
SALEM-636 005.

French Language A1 Level 2/A2
First year II semester

Course code: U19OLE1201   **0 0 2 1**

Course Outcomes : At the end of completion of this course, students will be able to,

1. Accept and refuse of an invitation, give some instruction of do's and don'ts, converse in commercial centres, write an invitation

2. Describe a city, locate a place in a city, ask further details, describe one's hometown

3. Talk about things around us, recite a past event, identify sign boards, express agree and disagree, express obligation and prohibition, sell an object in online

4. Talk about one's goals, express one's feelings, write a list of things to do, express an opinion, talk about weather, draft a mail response

5. Express one's interest and wish, describe a pet animal, express one's aversions, encourage others, write to ask for a help, narrate a past event, write a biography

Unit-I Gouter à la campagne   **6 hours**
Hr 2: City shopping and services, conjugation: payer, manger and acheter, negative sentence
Hr 4: Imperative sentence, food and beverages, utensils, cutleries, corckeries
Hr 6: Quantitative articles, quantities, pronoun 'en', express appreciation, write an invitation

Unit-II Voyager dans sa ville   **6 hours**
Hr 8: City and localities, Conjugation: prendre, adjectives of place, pronoun 'y'
Hr 10: Transport, leisure activities, preposition of place, degrees of comparison
Hr 12: Asking information about a new place, describe a city

Unit-III Faire du neuf avec du vieux   **6 hours**
Hr 14: Things in a store, conjugation : faire, imparfait 2, passé composé
Hr 16: Things in a repairing shop, computer, relative pronouns: que and qui
Hr 18: Imperative negative, express obligation and interdiction, online sale and response

Unit-IV Changer d'air   **6 hours**
Hr 20: Professions, conjugation: croire, voir, recent past tense
Hr 22: Traveling formalities, expressing about health condition, future tense
Hr 24: Pronoun COD, talk about weather condition, write about one's plans and projections

Unit-V Devenir éco-citoyen   **6 hours**
Hr 26: Citizenship and solidarity, conjugation: connaitre and savoir, depuis vs pendant
Hr 28: Imparfait vs passé composé, nature and environment, indirect pronouns COI
Hr 30: Animals, conditional, talk on supporting others, write a biography
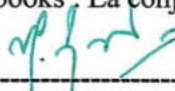
Total : 30 hours

Text Books

1. The course faculty will provide relevant audios, videos, handouts and notes.

2. Books : Saison (Méthode de français, cachier d'activités)

3. Reference books : La conjugaison, Dondon, Echo

Dr. M. Renuga
BoS – Chairperson,
Science & Humanities
HOD / H&L

Dr. M.RENUGA,
Professor & Head,
Department of Humanities & Languages.
Sona College of Technology.
SALEM - 636 005.

German Language Course

First year II semester

Course Code: U19OLE1202

L T P C
0 0 2 1

Course Outcomes: At the end of the course, students should be able to,
1. Use grammatical expressions appropriately in day-to-day conversation.
2. Make them frame simple sentences /questions.
3. Accentuate to start and sustain basic conversation
4. Helps them articulate thoughts in German
5. Identify the different forms of the verb.

UNIT – I   6
- Nominative/accusative case, adjectives

UNIT – II   6
- Modes of transportation, orientation, giving/understanding simple directions

UNIT – III   6
- Food and beverages, Modal verbs, Separable verbs

UNIT – IV   6
- Simple sentences using modal / separable verbs

UNIT – V   6
- Articles of clothing

Total : 30 hours

Text Book
Netzwerk A1

Dr. M. Renuga
BoS – Chairperson,
Science & Humanities
HOD / H&L

Dr. M.RENUGA,
Professor & Head,
Department of Humanities & Languages,
Sona College of Technology.
SALEM - 636

Course Outcomes: At the end of completion of this course, students will be able to,

1.0 Use verbs in polite conversation or for dissuasion and describe two different activities

2.0 Demonstrate the application of causative verbs and those that express ability or possibility, and describe experiences

3.0 Use plain-style expressions, those that state opinions, and verbs and adjectives that go with nouns

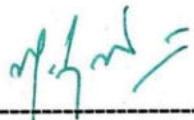4.0 Express sentences that use 'when' and 'if' and those that describe how services are given and received

5.0 Read 126 letters of Kanji, and demonstrate adequate knowledge of the lessons learnt in Levels I and II to pass the Japanese Language Proficiency Test (JLPT) for the N5 Level

•••

Unit-I 6 hours

Hr 1-2: Words and verbs expressing requests / Kanji 1-10

Hr 3-4: Asking for permission; making statements to prohibit something / Kanji 11-20

Hr 5-6: Describing two activities / Kanji 21-30

Unit-II 6 hours

Hr 7-8: Verbs that express 'I have to ...' / Kanji 31-40

Hr 9-10: Verbs which express ability or possibility / Kanji 41-50

Hr 11-12: Describing experience / Kanji 51-60

Unit-III 6 hours

Hr 13-14: Plain-style expressions / Kanji 61-70

Hr 15-16: Expressions like 'I think that ...' / Kanji 71-80

Hr 17-18: Qualifying nouns with verbs and adjectives / Kanji 81-90

Unit-IV 6 hours

Hr 19-20: Expressions using 'When ...' / Kanji 91-100

Hr 21-22: Describing the giving and receiving of services / Kanji 101-110

Hr 23-24: Expressions using 'If ...' / Kanji 111-126

Unit-V 6 hours

Hr 25-26: Preparing for JLPT N5
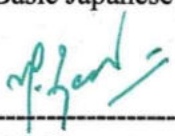
Hr 27-28: Preparing for JLPT N5

Hr 29-30: Preparing for JLPT N5

Total : 30 hours

Text Books

1. The course faculty will provide handouts / notes / course material.

2. Books on Basic Japanese language available in the college library.

Dr. M. Renuga
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Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester III under Regulations 2019 (CBCS)
Branch: Information Technology

S. No	Course Code	Course Title	Lecture	Tutorial	Practical	Credit	Total Contact Hours
		Theory					
1	U19MAT301D	Discrete And Combinatorial Mathematics	3	1	0	4	60
2	U19IT301	Data Structures	3	0	0	3	45
3	U19IT302	Digital Logic Design	3	0	0	3	45
4	U19IT303	Computer Architecture	3	0	0	3	45
5	U19IT304	Object Oriented Programming in C++	3	0	0	3	45
6	U19TAM301	தமிழரும் தொழில்நுட்பமும்/ Tamils and Technology	1	0	0	1	15
7	U19GE303	**Mandatory Course-** Essence of Indian Traditional Knowledge	2	0	0	0	30
		Practical					
8	U19IT305	Data Structures using C++ Laboratory	0	0	4	2	60
9	U19IT306	Digital Logic Design Laboratory	0	0	2	1	30
10	U19ENG301	Communication Skills Laboratory	0	0	2	1	30
11	U19GE301	Soft Skills and Aptitude – I	0	0	2	1	30
					Total Credits	22	

Approved By

Chairperson, Information Technology BoS
Dr.J.Akilandeswari

Member Secretary, Academic Council
Dr.R.Shivakumar

Chairperson, Academic Council & Principal
Dr.S.R.R.Senthil Kumar

Copy to:-
HOD/Information Technology, Third Semester BE IT Students and Staff, COE

05-07-2023

B. TECH. / INFORMATION TECHNOLOGY

SEMESTER – III	DISCRETE AND COMBINATORIAL MATHEMATICS	L	T	P	C
U19MAT301D		3	1	0	4

COURSE OUTCOMES

At the end of the course, the students will be able to

1. check the validity of the arguments in the field of data base and artificial intelligence using the rules of logic.
2. apply the concept of logical theory to validate the correctness of software specifications.
3. apply the combinatorics techniques to count, enumerate, or represent possible solutions in the process of solving application problems in the field of communication networks and string searching algorithm.
4. analyze and simplify the digital (logic) circuits using the concept of lattices.
5. produce an output for each input in computer programming and Turing machine.

CO / PO, PSO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3		3	2							2		2
CO2	3	3		3	2							2		2
CO3	3	3		3	2							2		2
CO4	3	3		3	2							2		2
CO5	3	3		3	2							2		2

UNIT – I   PROPOSITIONAL CALCULUS   12

Propositions – Logical connectives – Compound propositions – Conditional and biconditional propositions – Truth tables – Tautologies and contradictions – Contra positive – Logical equivalences and implications – DeMorgan's laws – Normal forms – Principal conjunctive and disjunctive normal forms – Rules of inference – Arguments – Validity of arguments.

UNIT – II   PREDICATE CALCULUS   12

Predicates – Statement function – Variables – Free and bound variables – Quantifiers – Universe of discourse – Logical equivalences and implications for quantified statements – Theory of inference – Rules of universal specification and generalization – Validity of arguments.

UNIT – III   COMBINATORICS   12

Counting principle – Sum and product rule – Pigeonhole principle – Permutations and combinations – Mathematical induction – Recurrence relation – Solution of recurrence relation using generating functions.

UNIT – IV   RELATIONS AND LATTICES   12

Relations - Types of relations and their properties – Equivalence relations – Partial order relation – Equivalence Classes – Partition of a set – Matrix representation of a relation – Representation of relations by graphs – Poset – Hasse diagram – Lattices and their properties.

20. 05. 2020

B. E. / B. Tech. Regulations 2019

UNIT – V   FUNCTIONS

12

Functions – Classification – Types of functions and examples – Composition of functions – Inverse functions – Characteristic function of a set - Permutation functions.

Theory: **45 Hours**   Tutorial: **15 Hours**   Total: **60 Hours**

TEXT BOOKS:
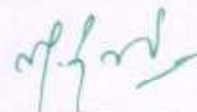
1. K. H. Rosen, "Discrete Mathematics and its Applications", McGraw Hill Publishers, 8th Edition, 2019.
2. J. P. Trembly and R. Manohar, "Discrete Mathematical Structures with Applications to Computer Science", McGraw Hill Publishers, 1st Edition, 2017.

REFERENCES:

1. T. Veerarajan, "Discrete Mathematics with Graph Theory and Combinatorics", McGraw Hill Publishers, 19th Reprint, 2014.
2. R. P. Grimaldi, "Discrete and Combinatorial Mathematics: An Applied Introduction", Pearson Publishers, 5th Edition, 2006.
3. https://nptel.ac.in/courses/106/106/106106094/

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Dr. M. RENUGA
BoS - Chairperson
Science and Humanities
Sona College of Technology
Salem – 636 005

20. 05. 2020

B. E. / B. Tech. Regulations 2019

U19IT301   **DATA STRUCTURES**   **3 0 0 3**

COURSE OUTCOMES

At the end of the course, the student will be able to

1. Apply and implement linear data structure

2. Apply different nonlinear data structures.

3. Implement variants of different tree data structure.

4. Analyze simple algorithms and develop algorithms using hashing.

5. Develop and apply algorithms for real time applications using graph.

	CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak													
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	1	1						1			3	2
CO2	3	2	1	2						1			2	2
CO3	3	2	1	2						1			3	3
CO4	3	2	1	2						1			2	2
CO5	3	2	1	2						1			3	3

UNIT I   LINEAR STRUCTURES   9

Abstract Data Types (ADT) - List ADT - Array-Based Implementation - Linked List Implementation - Doubly Linked Lists - Applications Of Lists - Stack ADT - Queue ADT - Circular Queue Implementation - Applications of Stacks And Queues

UNIT II   TREE STRUCTURE   9

Preliminaries of Trees - Implementation of Tree ADT - Tree Traversals - Binary Tree ADT - Expression Trees - Binary Search Tree ADT - AVL Trees - Applications of Trees.

UNIT III   TREE VARIANTS AND BINARY HEAP   9

Splay Trees - Splaying - B Trees - Priority Queue: Model - Simple Implementation - Binary Heap - Basic Heap Operations - Applications of Priority Queue.

UNIT IV   ALGORITHM ANALYSIS & HASHING   9

Algorithm Analysis - Asymptotic Notations - Time complexity - Space complexity - Hashing - General idea - Hash Function - Separate Chaining - Open Addressing - Linear Probing - Quadratic Probing - Double Hashing - Rehashing - Extendible Hashing

UNIT V   GRAPH   9

Definitions - Representation of Graphs - Traversals - Breadth First Search - Depth-first Search - Topological Sort – Shortest path Algorithms - Unweighted Shortest Paths - Dijkstra's Algorithm- Minimum Spanning Tree - Prim's and Kruskal's.

TOTAL : 45 HOURS

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1

TEXT BOOK

1. M. A. Weiss, "Data Structures and Algorithm Analysis in C++", Fourth Edition, Pearson Education, 2014.

REFERENCES

1. D.S. Malik, "Data Structures Using C++", 2nd edition , Cengage, 2012.

2. Yedidyah Langsan, Moshe J. Augenstein And Aoron M. Tanenbaum," Data Structures using C and C++", Pearson, 2006

3. Sartaj Sahni, " Data Structures, Algorithm and Application in C++", 2nd edition, Universities Press, 2005.

4. Michael T.Goodrich, R.Tamassia and Mount "Data structures and Algorithms in C++", 2nd edition, Wiley , 2016.

COURSE OUTCOMES

At the end of the course, the student will be able to

1. Simplify the Boolean expression using K-Map and tabulation techniques.
2. Use Boolean simplification techniques to design a combinational circuit.
3. Analysis and Design of a given combinational digital/logic circuits.
4. Analysis and Design of a given sequential digital/logic circuits.
5. **Design for Hazard free combinational and sequential circuits.**

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	1					1			1	1
CO2	3	3	3	2	1					1			1	1
CO3	3	3	3	2	1					1			1	1
CO4	3	3	3	2	1					1			1	1
CO5	3	3	3	2	1					1			1	1

UNIT I   BOOLEAN ALGEBRA AND LOGIC GATES   9

Review of Number systems – Complements - Digital Logic gates - Basic theorems and properties of Boolean algebra - Boolean functions – Canonical and Standard forms - Simplifications of Boolean functions using Karnaugh map – three variable, Four variable and Five variable – Product of sum simplification- Don't care conditions – Quine McCluskey(QM) method.

UNIT II   COMBINATIONAL LOGIC   9

Combinational circuits – Analysis and design procedures - Code conversion – Binary to Gray, Gray to Binary – BCD to Excess - 3, Excess - 3 to BCD- Circuits for arithmetic operations –Half Adder – Full Adder - Binary Adder– Half subtractor – Full subtractor – Binary subtractor- BCD adder- Binary Multiplier – Magnitude comparator.

UNIT III   MSI LOGIC CIRCUITS AND PROGRAMMABLE LOGIC   9

Decoders – combinational logic implementation using decoder – Encoders- Priority encoder-Multiplexers-Boolean function Implementation using multiplexer – Demultiplexer - Programmable logic Array –Implementation of Boolean functions with PLA - Programmable Array logic. Implementation of Boolean functions with PAL.

UNIT IV   SYNCHRONOUS SEQUENTIAL LOGIC   9

Sequential circuits – Flip flops – RS, JK, D, T - Analysis of clocked sequential circuits –State equations, State Table, State diagram - Analysis with D, JK and T Flip flops – State reduction

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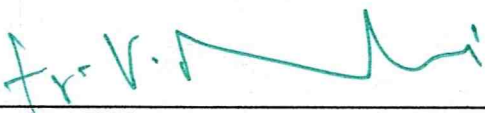SONA COLLEGE OF TECHNOLOGY
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and state assignment - Design procedures – Synthesis using D, JK and T – Sequence detector – Parallel counter design using flip-flops.

UNIT V   HAZARDS AND FPGA LOGIC   9

Introduction- Hazards –Hazards in Combinational Circuits -Hazards in Sequential Circuits – FPGA – Basics – FPGA Vs CPLD – FPGA Architecture – Configurable Logic Block – Basic Architecture of Xilinx XC 4000 series- Design flow –Design entry – Logic Synthesis – Design implementation – Design verification – Types of FPGA based on Application .
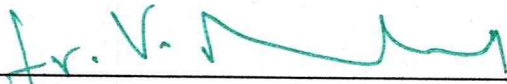
TOTAL: 45 HOURS

TEXT BOOK

1. M.Morris Mano, Michel D. Ciletti, and John F.Walerly "Digital Design", 5th edition, Pearson Education, 2013.

REFERENCES

1. Larry L Kinney and Charles H.Roth Jr, "Fundamentals of Logic Design", 5th edition, Jaico Publishing House, 2015.

2. Ananda Natarajan, "Digital Design", PHI learning private Ltd, 2015.

3. Donald P.Leach, Albert Paul Malvino and Saha, "Digital Principles and Applications", 8th edition, TMH, 2014.

4. G.K.Kharate, "Digital Electronics", Oxford University press, 2012.

5. John F.Wakerly, "Digital Principles and practices", 4th edition, Pearson Education, 2013.

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COURSE OUTCOMES:

At the end of the course, the student will be able to

1. Explain the processor design concepts in modern computer architecture.
2. Explain the operations and instruction sequences in a basic computer.
3. Apply the concepts of pipelining to solve performance related problems.
4. Explain the hierarchical memory system including cache memory and virtual memory.
5. Choose appropriate I/O devices for embedded system applications.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	1	1						1			2	2
CO2	3	1	1	1						1			1	1
CO3	3	1	1	1						1			3	3
CO4	3	1	1	1						1			3	3
CO5	3	1	1	1						1			3	1

UNIT I   BASIC STRUCTURE OF COMPUTERS   9

Functional units – Basic operational concepts – Bus structures – Software – Performance and metrics – Multiprocessors and Multicomputer – Memory Locations and Addresses– Instructions and instruction sequencing – Addressing modes – Fixed point and Floating point representations.

UNIT II   BASIC PROCESSING UNIT   9

Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Micro programmed control: Micro Instructions- Micro Instructions with next address field.

UNIT III   PIPELINING   9

Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets –Data path and control considerations – Superscalar operation– Performance considerations.

UNIT IV   MEMORY SYSTEM   9

Basic concepts – Semiconductor RAM – ROM – Speed Size and cost – Cache memories – performance consideration – Virtual memory – Memory management requirements – Associative memories – Secondary storage devices.

UNIT V   I/O ORGANIZATION AND EMBEDDED SYSTEMS   9

I/O devices - Accessing I/O devices –Interrupts – Direct Memory Access –Interface circuits – Standard I/O Interfaces (USB, Fire wire, SCSI Bus, SATA) – Examples of Embedded Systems - Microcontroller Chips for Embedded Applications – Introduction to SoC.

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TEXT BOOK

1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky and Naraig Manjikian "Computer Organization and Embedded Systems", 6th edition, McGraw Hill Education, 2017.

REFERENCES

1. William Stallings, "Computer Organization and Architecture – Designing for Performance", 10th edition, Pearson Education, 2015.

2. David A. Patterson and John L. Hennessy, "Computer Organization and Design: The Hardware/Software interface", 5th edition, Elsevier, 2013.

3. B. Govindarajalu, "Computer Architecture and Organization: Design Principles and Applications", 2nd edition, McGraw Hill Education, 2010.

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COURSE OUTCOMES

At the end of the course, the student will be able to

1. Explain fundamental programming concepts such as variables, conditional statements, looping constructs, and methods (procedures), inline function, friend function.

2. Describe how the class mechanism supports encapsulation and information hiding

3. Apply the concept of constructors, destructors and operator overloading.

4. Apply templates and inheritance mechanism in applications.

5. Write C++ programs for applications using files and exceptions.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak													
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2		1					1			2	2
CO2	3	1	1		1					1			3	3
CO3	3	3	3		2					1			3	3
CO4	3	3	3		2					1			3	3
CO5	3	3	3		2					1			3	3

UNIT I   OBJECT ORIENTED CONCEPTS   9

Introduction to Object Oriented Programming and C++: Object oriented concepts and its characteristics: abstraction, encapsulation, inheritance, and polymorphism. History of C++ - Structure of C++-Applications of C++- Tokens- Keywords- Identifiers-Basic data types- Derived data types- Symbolic constants- Dynamic initialization -Reference variables- Scope resolution operator-Type modifiers- Type casting.

C++ Operators and control statements- Input and output statements- Function Prototyping- Function components- Passing parameters - call by reference, return by reference- Inline function- Default arguments - Overloaded function- Introduction to friend function.

UNIT II   CLASSES AND OBJECTS, CONSTRUCTORS AND DESTRUCTORS   9

Classes and Objects: Class specification- Member function definition- Nested member function- Access qualifiers- Static data members and member functions - Instance creation- Array of objects- Dynamic objects-Static Objects- Objects as arguments- Returning objects.

Constructors and Destructors: Constructors –, Parameterized constructors- Overloaded Constructors- Constructors with default arguments-Copy constructors- Dynamic constructors- Dynamic initialization using constructors- Destructors.
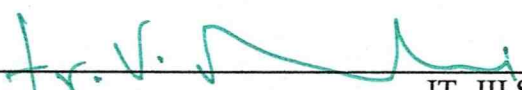
UNIT III   OPERATOR OVERLOADING AND TEMPLATES   9

Operator Overloading: Operator function – Overloading unary and binary operator-Overloading binary operator using friend function - Type Conversion.

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Generic Programming with Templates: Introduction, class templates – class templates with multiple parameters - Function templates, Function templates with multiple parameters-overloading of function templates, Member function Templates, Non-Type Template Arguments- Inheritance of class template.

UNIT IV   INHERITANCE AND VIRTUAL FUNCTIONS   9

Inheritance: Defining Derived classes- Single Inheritance- Protected Data with private inheritance- Multiple Inheritance- Multi level inheritance- Hierarchical Inheritance- Hybrid Inheritance-Multipath inheritance- Virtual Base Classes- Abstract classes -Constructors in derived class- Member Classes

Virtual Function: Definition – Runtime Polymorphism – Array of pointers to base class – virtual functions - Pure virtual functions – Virtual Destructors.

UNIT V   STREAMS AND EXCEPTION HANDLING   9

Streams: Streams in C++- Stream classes- Formatted and unformatted data- Manipulators- User defined manipulators- File streams-File pointer and manipulation-File open and close- Sequential and random access-Name Space.

Exception Handling: Principle of exception handling-Exception handling mechanism, multiple catch, nested try, rethrowing the exception – specifying exceptions.

TOTAL: 45 HOURS

TEXT BOOK

1. Robert Lafore, "Object-Oriented Programming in C++" Pearson Education, 4 Edition, 2008. (Unit- I, II, III, IV, V)

2. K R Venugopal, Rajkumar Buyya "Mastering C++" Tata McGraw Hill, New Delhi, Second edition 2015. (Unit- I, II, III, IV, V)

REFERENCES

1. H. M. Deitel, P. J. Deitel, " C++ How to Program", Fifth Edition, Deitel & Associates, Inc.

2. Nicholas A. Solter, Scott J. Kleper, "Professional C++", 3rd Edition, Wiley Publishing,

3. Ira Pohl, "Object Oriented Programming using C++", Pearson Education, Second Edition Reprint 2004.

4. S. B. Lippman, Josee Lajoie, Barbara E. Moo, "C++ Primer", Fourth Edition, Pearson Education, 2005.

5. B. Stroustrup, "The C++ Programming language", 3rd edition, Pearson Education, 2004.

6. E. Balaguruswamy, "Object-Oriented Programming with C++" Tata McGraw Hill, New Delhi, Sixth edition 2015.

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COURSE OUTCOMES

At the end of the course, the student will be able to

1. Implement the basic concept of C++ such as Polymorphism, Inheritance, Friend and virtual Function

2. Implement operations of linear and tree data structures.

3. Implement hashing and graph data structure.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
Cos	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	1	1						1	3	1	3	3
CO2	3	1	1	1						1	3	1	3	3
CO3	3	1	1	1						1	3	1	3	3

LIST OF EXPERIMENTS

1. Design C++ classes with static members, methods with default argument

2. Practice of dynamic memory allocation using constructor, destructor, copy constructor.

3. Practice of C++ concepts such as polymorphism, inheritance, friend and virtual function.

4. Implement streams and exception handling concept.

5. Implementation of singly linked lists and doubly linked lists.

6. Implement stack and queue data structure using linked list

7. Implement binary search tree and B tree.

8. Implement hashing techniques.

9. Implement depth first traversal and breadth first traversal using STL.

10. Implementation of Prim's and Kruskal's algorithm using STL.

TOTAL: 60 HOURS

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COURSE OUTCOMES

At the end of the course, the student will be able to

1. Use Boolean simplification techniques to design and construct simple Boolean theorems and functions.
2. Design and implement combinational and sequential circuits.
3. Design the different functional units in a digital computer system.

Cos	CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak													
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2						2	3	1	1	1
CO2	3	3	3	2					.	1	3	1	1	1
CO3	3	3	3	2						1	3	1	1	1

LIST OF EXPERIMENTS

1. Verification of Boolean theorems using digital logic gates

2. Design and implementation of combinational circuits using basic gates for arbitrary functions.

3. Design and implementation of Binary to Gray and Gray to Binary code converters.

4. Design and implementation of Half adder / Half subtractor, Full adder / Full subtractor using basic gates.

5. Design and implementation of 4-bit binary adder / subtractor using basic gates and MSI devices.

6. Design and implementation of parity generator / checker using basic gates and MSI devices.

7. Design and implementation of magnitude comparator.

8. Design and implementation of Decoders and encoders.

9. Design and implementation of Multiplexers/Demultiplexers.

10. Design and implementation of Shift registers.

11. Design and implementation of Synchronous counters.

12. Design and implementation of Asynchronous counters.

TOTAL: 30 HOURS

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U19TAM301   தமிழரும் தொழில்நுட்பமும்   L T P C
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அலகு I   நெசவு மற்றும் பானைத் தொழில்நுட்பம்:   3

சங்க காலத்தில் நெசவுத் தொழில் – பானைத் தொழில்நுட்பம் – கருப்பு சிவப்பு பாண்டங்கள் – பாண்டங்களில் கீறல் குறியீடுகள்.

அலகு II   வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்:   3

சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு– சங்க காலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் – சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் – மாமல்லபுரச் சிற்பங்களும், கோவில்களும் – சோழர் காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் – நாயக்கர் காலக் கோயில்கள் – மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் – செட்டிநாட்டு வீடுகள் – பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ–சாரோசெனிக் கட்டிடக் கலை.

அலகு III   உற்பத்தித் தொழில் நுட்பம்:   3

கப்பல் கட்டும் கலை – உலோகவியல் – இரும்புத் தொழிற்சாலை – இரும்பை உருக்குதல், எஃகு – வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் – நாணயங்கள் அச்சடித்தல் – மணி உருவாக்கும் தொழிற்சாலைகள் – கல்மணிகள், கண்ணாடி மணிகள் – சுடுமண் மணிகள் – சங்கு மணிகள் – எலும்புத்துண்டுகள் – தொல்லியல் சான்றுகள் – சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.

அலகு IV   வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நுட்பம்:   3

அணை, ஏரி, குளங்கள், மதகு – சோழர்காலக் குமுழித் தூம்பின் முக்கியத்துவம் – கால்நடை பராமரிப்பு – கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் – வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள் – கடல்சார் அறிவு – மீன்வளம் – முத்து மற்றும் முத்துக்குளித்தல் – பெருங்கடல் குறித்த பண்டைய அறிவு – அறிவுசார் சமூகம்.

அலகு V   அறிவியல் தமிழ் மற்றும் கணித்தமிழ்:   3

அறிவியல் தமிழின் வளர்ச்சி –கணித்தமிழ் வளர்ச்சி – தமிழ் நூல்களை மின்பதிப்பு செய்தல் – தமிழ் மென்பொருட்கள் உருவாக்கம் – தமிழ் இணையக் கல்விக்கழகம் – தமிழ் மின் நூலகம் – இணையத்தில் தமிழ் அகராதிகள் – சொற்குவைத் திட்டம்.

                                                        TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS

1. தமிழக வரலாறு – மக்களும் பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் – முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருநை – ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
9. Keeladi - 'Sangam City C ivilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, TamilNadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

HOD

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U19TAM301 **TAMILS AND TECHNOLOGY** **L T P C**
1 0 0 1

UNIT I **WEAVING AND CERAMIC TECHNOLOGY** 3

Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW)
– Graffiti on Potteries.

UNIT II **DESIGN AND CONSTRUCTION TECHNOLOGY** 3

Designing and Structural construction House & Designs in household materials during Sangam Age -Building
materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram - Sculptures and
Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period -
Type study (Madurai Meenakshi Temple)- Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo - Saracenic
architecture at Madras during British Period.

UNIT III **MANUFACTURING TECHNOLOGY** 3

Art of Ship Building - Metallurgical studies - Iron industry - Iron smelting, steel -Copper and gold- Coins as
source of history - Minting of Coins – Beads making-industries Stone beads -Glass beads - Terracotta beads -
Shell beads/ bone beats - Archeological evidences - Gem stone types described inSilappathikaram.

UNIT IV **AGRICULTURE AND IRRIGATION TECHNOLOGY** 3

Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry - Wells
designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche
diving - Ancient Knowledge of Ocean - Knowledge Specific Society.

UNIT V **SCIENTIFIC TAMIL & TAMIL COMPUTING** 3

Development of Scientific Tamil - Tamil computing – Digitalization of Tamil Books – Development of Tamil
Software – Tamil Virtual Academy – Tamil Digital Library – Online Tamil Dictionaries –Sorkuvai Project.

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS

1. தமிழக வரலாறு – மக்களும் பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும்
   கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் – முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருநை – ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of
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8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute
   of Tamil Studies.)
9. Keeladi - 'Sangam City C ivilization on the banks of river Vaigai' (Jointly Published by: Department of
   Archaeology & Tamil Nadu Text Book and Educational Services Corporation, TamilNadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The
    Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and
    Educational Services Corporation, Tamil Nadu)
12. Journey of Civilization Indus to Vaigai (R.Ramakrishna) (Published by: RMRL) – Reference Book.

HOD 1/9/23

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U19GE303   **ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE**   **2 0 0 0**

Course Outcomes

At the end of the course, the students will be able to,

1. Analyze the basics of Indian traditional knowledge in modern scientific perspectives.
2. Explain the basics of Vedic science and its applications in modern days.
3. Discuss the introduction and objectives of modern science.
4. Describe the contribution of Noble laurates for India's achievements in Science and Technology.
5. Analyze the various traditional practices for holistic health care of human beings.

COs	CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak													
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	-	-	2	-	-	-	-	-	-	-	2
CO2	2	2	2	-	-	2	-	-	-	-	-	-	-	2
CO3	3	2	2	-	-	2	-	-	-	-	-	-	-	2
CO4	3	2	2	-	-	2	-	-	-	-	-	-	-	2
CO5	2	2	2	-	-	2	-	-	-	-	-	-	-	2

Unit I

- Introduction to Vedas   6
- Traditional methodology of Veda – Sat Angas
- Types of Vedas and their application
- Sub Veda – Ayurveda - their modern day application

Unit II

- Basics of Applied Vedic Science   6
- Modern day application of Vedas and procedure
- Ancient Indian Scientific thoughts
- Introduction to the Vedic language "Sanskrit"

UNIT – III- Modern Science

- Introduction – modern science   6
- Objectives – modern science
- Architecture in ancient India

UNIT – IV Technology

- India's contribution to science and technology (from ancient to modern)   6
- Nobel laureates of Indian origin and their contribution
- India in space
- Latest achievement from Jan – 2017

UNIT – V- Yoga and Holistic Health Care   6
- Fundamentals of yoga and holistic health
- Human biology
- Diet and nutrition
- Life management
- Contemporary yogic models – case study

Reference Books
1. V. Sivaramakrishna (Ed.), Cultural Heritage of India-Course Material, Bharatiya Vidya Bhavan,Mumbai, 5th Edition, 2014
2. Swami Jitatmanand, Modern Physics and Vedant, Bharatiya Vidya Bhavan
3. RN Jha, Science of Consciousness Psychotherapy and Yoga Practices, Vidyanidhi Prakasham, Delhi,2016.
4. Roshan Dalal The Vedas: An Introduction to Hinduism's Sacred Texts, Penguin Books 2014. ISBN13: 9780143066385
5. Raja Ram Mohan Roy, Vedic Physics, Mount Meru Publication ISBN : 9781988207049

Total: 30 hours

M. Raja
Course Coordinator / Sciences

Dr. C. Shanthi
HOD / Sciences

Dr. M. Renuga
Chairperson BOS,
Science and Humanities

U19ENG301- Communication Skills Laboratory (Lab/Practical Course)   0 0 2 1

(Common to all branches of Third / Fourth Semester B.E / B.Tech-programmes)

Course Outcome: At the end of the course, the students will be able to
- Communicate confidently and effectively
- Demonstrate active listening skills
- Practice soft skills and interpersonal skills to excel in their jobs.
- Use language efficiently to face interviews, participate in group discussions and present speeches.

1. **Listening Comprehension**: Listening and typing – listening and sequencing of sentences – Filling in the blanks – Listening and answering questions.

2. **Reading Comprehension**: Filling in the blanks – Cloze exercises – Vocabulary building – Reading and answering questions.

3. **Speaking: Phonetics**: Intonation – Ear training – Correct Pronunciation – Sound recognition exercises – Common errors in English.

Conversations: Face to Face Conversation – Telephone conversation – Role play activities (Students take on roles and engage in conversation)

4. Making presentations: introducing oneself – introducing a topic – answering questions – individual presentation practice

5. Creating effective PPTs – presenting the visuals effectively

6. Using appropriate body language in professional contexts – gestures, facialexpressions, etc.

7. Preparing job applications - writing covering letter and résumé

8. Applying for jobs online - email etiquette

9. Participating in group discussions – understanding group dynamics - brainstorming the topic – mock GD

10. Training in soft skills - persuasive skills – people skills - questioning and clarifying skills

11. Writing Project proposals: collecting, analyzing and interpreting data / drafting the final report

12. Attending job interviews – answering questions confidently

13. Interview etiquette – dress code – body language – mock interview

TOTAL: 30 PERIODS

REFERENCE BOOKS:
1. English and Soft Skills, Dhanavel, S.P. Hyderabad: Orient BlackSwan Ltd. 2010.
2. How to Prepare for Group Discussion and Interview, Corneilssen, Joep. New Delhi: Tata-McGraw-Hill, 2009.
3. Group Discussion and Team Building D'Abreo, Desmond A. Mumbai: Better yourself books, 2004.
4. The ACE of Soft Skills, Ramesh, Gopalswamy, and MahadevanRamesh.New Delhi: Pearson, 2010.
5. Corporate Soft Skills, Gulati, Sarvesh. New Delhi: Rupa and Co. 2006.
6. Presentation Skills for Students, Van Emden, Joan, and Lucinda Becker. New York: Palgrave Macmillan, 2004.
7. Dictionary of Common Errors, Turton, N.D and Heaton, J.B. Addision Wesley Longman Ltd., Indian reprint 1998.

EXTENSIVE READING
1. The 7 Habits of Highly Effective People,Covey, Stephen R. New York: Free Press, 1989.
2. The Professional, Bagchi, Subroto.New Delhi: Penguin Books India, 2009.

HOD

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Semester-III	U19GE301-SOFT SKILLS AND APTITUDE – I	L	T	P	C	Marks
		0	0	2	1	100

Course Outcomes

At the end of the course the student will be able to:

1. Demonstrate capabilities in specific soft-skill areas using hands-on and/or case-study approaches
2. Solve problems of greater intricacy in stated areas of quantitative aptitude and logical reasoning
3. Demonstrate good vocabulary skills, analyse comprehension and critical reasoning passages, spot errors and utilize language skills to describe pictures effectively.

1.Soft Skills	**Demonstrating soft-skill capabilities with reference to the following topics:** a. Attitude building b. Dealing with criticism c. Innovation and creativity d. Problem solving and decision making e. Public speaking f. Group discussions
2. Quantitative Aptitude **and** **Logical Reasoning**	**Solving problems with reference to the following topics:** a. Vedic Maths: Fast arithmetic, multiplications technique, Criss cross, Base technique, Square root, Cube root, Surds, Indices, Simplification. b. Numbers: Types, Power cycle, Divisibility, Prime factors & multiples, HCF & LCM, Remainder theorem, Unit digit,Tens digit, highest power. c. Averages: Basics of averages and weighted average. d. Percentages: Basics of percentage and Successive percentages. e. Ratio and proportion: Basics of R &P, Alligations, Mixture and Partnership. f. Profit ,Loss and Discount: Basic & Advanced PLD g. Data Interpretation: Tables, Bar diagram, Venn diagram, Line graphs, Pie charts, Case lets, Mixed varieties, Network diagram and other forms of data interpretation. h. Syllogism: Six set syllogism using Venn diagram and tick and cross method
3. Verbal Aptitude	**Demonstrating English language skills with reference to the following topics:** a. Verbal analogy b. Tenses c. Prepositions d. Reading comprehension e. Choosing correct / incorrect sentences f. Describing pictures g. Error spotting

31/7/2023.

Dr.S.Anita

Head/Training

Dr. S. ANITA
Professor and Head
Department of Training,
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Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester IV under Regulations 2019 (CBCS)
Branch: Information Technology

S. No	Course Code	Course Title	Lecture	Tutorial	Practical	Credit	Total Contact Hours
		Theory					
1	U19MAT401C	Operations Research	3	1	0	4	60
2	U19IT401	Operating Systems	3	0	2	4	75
3	U19IT402	Principles of Communication	3	0	0	3	45
4	U19IT403	Design and Analysis of Algorithms	3	0	2	4	75
5	U19IT404	Java Programming	3	0	0	3	45
6	U19GE402	**Mandatory Course-** Environment and climate science	2	0	0	0	30
		Practical					
7	U19IT405	Java Programming Laboratory	0	0	2	1	30
8	U19IT406	Microprocessors Laboratory	1	0	2	2	45
9	U19GE401	Soft Skills and Aptitude - II	0	0	2	1	30
					Total Credits	22	

Approved By

Chairperson, Information Technology BoS
Dr.J.Akilandeswari

Member Secretary, Academic Council
Dr.R.Shivakumar

Chairperson, Academic Council & Principal
Dr.S.R.R.Senthil Kumar

Copy to:-HOD/Information Technology, Fourth Semester BE IT Students and Staff, COE

22-12-2023

Regulations-2019

B. TECH / INFORMATION TECHNOLOGY

SEMESTER – IV U19MAT401C	OPERATIONS RESEARCH	L	T	P	C
		3	1	0	4

COURSE OUTCOMES

At the end of the course, the students will be able to,

1. solve the linear programming problem using suitable methods.
2. apply the concept of duality and dual simplex method to solve the linear programming problem.
3. apply the optimization technique to the transportation and assignment problems.
4. analyze project management problems using critical path method and project evaluation and review technique.
5. determine an optimum sequence of performing a number jobs by a number of facilities.

CO / PO, PSO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3		3	2								2		2
CO2	3	3		3	2								2		2
CO3	3	3		3	2								2		2
CO4	3	3		3	2								2		2
CO5	3	3		3	2								2		2

UNIT – I   LINEAR PROGRAMMING PROBLEM   12

Linear programming problem - mathematical formulation – graphical solution method – canonical and standard forms of linear programming problem – simplex method (using slack variables only) – use of artificial variables – big-M method.

UNIT – II   DUALITY IN LINEAR PROGRAMMING PROBLEM   12

Duality in linear programming problem – Formulation of dual linear programming problem – primal-dual relationship – solving linear programming problem using dual concepts – dual simplex method.

UNIT – III   TRANSPORTATION AND ASSIGNMENT PROBLEMS   12

Transportation problem – initial basic feasible solution – north west corner rule – least cost method – Vogel's approximation method – modified distribution method – assignment problem – Hungarian method.

UNIT – IV   CPM AND PERT   12

Network construction – critical path method (CPM) – computations of total, free and independent floats – project evaluation and review technique (PERT) analysis – computation of expected time and standard deviation.

UNIT – V   SEQUENCING PROBLEM   12

Sequencing problem – processing n jobs through two machines – processing n jobs through three machines – processing n jobs through m machines – processing two jobs through m machines.

Theory: **45 Hours**   Tutorial: **15 Hours**   Total: **60 Hours**
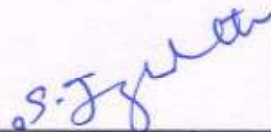
13. 01. 2021   B. E. / B. Tech. Regulations 2019

TEXT BOOKS:
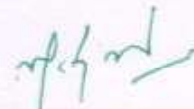
1. H. A. Taha, "Operation Research: An Introduction", Pearson Publishers, 10th Edition, 2019.
2. J. K. Sharma, "Operations Research: Theory and Applications", Lakshmi Publishers, 6th Edition, Reprint, 2017.

REFERENCE BOOKS:

1. R. Panneerselvam, "Operations Research", Prentice Hall of India Publishers, 2nd Edition, 2012.
2. K. Swarup, P. K. Gupta and Man Mohan, "Introduction to Operations Research", Sultan Chand and Sons Publishers, 14th Edition, 2008.
3. P. K. Gupta and D. S. Hira, "Problems in Operation Research", Sultan Chand and Sons Publishers, 4th Edition, 2015.
4. S.D. Sharma, "Operations Research", Kedarnath Publishers, 8th Edition, 2007.

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BoS - Chairperson
Science and Humanities
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Salem – 636 005

13. 01. 2021   B. E. / B. Tech. Regulations 2019

U19IT401   **OPERATING SYSTEMS**   **3 0 2 4**

COURSE OUTCOMES

At the end of the course, the student will be able to

1. Explain structures of Operating System.

2. Apply fundamental Operating System abstractions such as processes, process scheduling, Semaphores, IPC abstractions, shared memory regions, deadlock and threads.

3. Explain the principles of concurrency and synchronization, and apply them to write concurrent programs/software.

4. Implement basic resource management techniques and principles.

5. Describe the types of disk scheduling, disk management and learn the basics of Linux.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	3	2							2	2	
CO2	3	2	3	3	2							2	2	
CO3	3	2	3	3	2							2	2	
CO4	3	2	3	3	2							2	2	
CO5	3	2	3	3	2							2	2	

UNIT I   **INTRODUCTION**   **9**

Introduction - Operating System Structure – Operating system Operations – Operating System Components: Process Management – Memory Management – Storage Management – I/O Management – Network Management - Protection and Security.

Classes of Operating Systems: Mainframe Systems – Single Processor System - Multiprocessor Systems - Desktop Systems — Distributed Systems – Clustered Systems – Real-Time Systems – Handheld Systems - Open Source Operating Systems.

Operating System Structures: Operating System Services – User and Operating System Interface – System Calls – Types of System Calls.

UNIT II   **PROCESS MANAGEMENT AND THREADING**   **9**

Processes: Process concept – Process scheduling – Operation on Processes - Inter-process Communication: Shared Memory Systems - Message Passing Systems.

Process Scheduling: Basic Concepts – Scheduling Criteria – Scheduling Algorithms: First-Come, First-Served – Priority – Round-Robin – Multilevel Queue – Multilevel Feedback Queue.

Threads: Overview – Multithreading models - Threading issues.

Date: 10-01-2024

UNIT III   PROCESS SYNCHRONIZATION AND DEADLOCKS   9

Process Synchronization: Background - The critical-section problem (Software based solution and hardware based solution) – Semaphores – Classic Problems of Synchronization – Monitors.

Deadlocks: System model - Deadlock Characterization – Methods for Handling Deadlocks - Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlocks.

UNIT IV   MEMORY MANAGEMENT   9

Memory Management Strategies: Background – Swapping – Memory allocation: Contiguous Memory Allocation – Non-contiguous Memory Allocation: Segmentation - Paging – Segmentation with Paging - Structure of the Page Table.

Virtual Memory: Background - Demand Paging – Page Replacement – Allocation of Frames – Thrashing.

UNIT V   STORAGE MANGEMENT AND CASE STUDY   9

Mass Storage Structure: Overview of Mass Storage Structure – Disk Structure - Disk Scheduling – Disk Management - Swap Space Management.

Case Study: Linux System –Design Principles, Kernel Modules, Process Management, Scheduling, Memory Management, File System, Inter-process communication

LECTURE : 45 HOURS   PRACTICAL : 30 HOURS   TOTAL: 75 HOURS

TEXT BOOK

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", Ninth Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2018.

REFERENCES

1. Harvey M. Deitel, "Operating Systems", Pearson Education, 3rd edition 2016.

2. Andrew S. Tanenbaum, "Modern Operating Systems", Prentice Hall of India, 3rd edition 2013.

3. William Stallings, "Operating Systems: Internals and Design Principles", Prentice Hall of India, 7th edition, 2013.

4. D M Dhamdhere, "Operating Systems: A Concept-Based Approach", Tata Mc-graw Hill Publishing, 3rd edition, 2017.

LIST OF EXPERIMENTS

1. Program to report the behaviour of the OS to get the CPU type and model, kernel version.
2. Program to get the amount of memory configured into the computer, amount of memory currently available.
3. Simulate the principles of process management algorithms
4. Implement various memory allocation methods
5. Implement various page replacement algorithms
6. Implement various disk scheduling algorithms
7. Implement threads and fork
8. Simulate Inter process communications

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Date: 10-01-2024

Information Technology

B Tech - Regulations 2019

COURSE OUTCOMES

At the end of the course, the student will be able to

1. Explain and apply various types of modulation and demodulation in analog and digital communication.

2. Describe the concept of digital communication techniques.

3. Describe the concept of various digital transmission techniques.

4. Comprehend the Cellular communication techniques.

5. Explain the concepts of 5G Wireless communication.

	CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak													
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3			2									2	
CO2	3					1								2
CO3	2				2								2	
CO4					3	2							2	2
CO5	1			2	3	2							2	2

UNIT I   FUNDAMENTALS OF ANALOG COMMUNICATION   9

Principles of amplitude modulation - AM envelope - frequency spectrum and bandwidth - modulation index and percent modulation - AM Voltage distribution - AM power distribution - Angle modulation - FM and PM waveforms - phase deviation and modulation index - frequency deviation and percent modulation - Frequency analysis of angle modulated waves - Bandwidth requirements for Angle modulated waves.

UNIT II   DIGITAL COMMUNICATION   9

Shannon limit for information capacity - Digital amplitude modulation - Frequency Shift Keying - FSK bit rate and baud - FSK transmitter - BW consideration of FSK - FSK receiver - Phase Shift Keying – BPSK , QPSK, DPSK transmitter and receiver ,Quadrature Amplitude modulation - bandwidth efficiency.

UNIT III   DIGITAL TRANSMISSION   9

Pulse modulation - PCM – PCM sampling - Sampling rate - Signal to Quantization noise rate - Companding- analog and digital - Delta modulation PCM - Adaptive Delta modulation PCM - Differential PCM - Intersymbol interference - Eye patterns.

Date: 10-01-2024

UNIT IV   INTRODUCTION TO MOBILE TECHNOLOGY   9

Introduction - 2G - General Concept for GSM System Development - GSM System Architecture - SIM Concept - 3G – UMTS Architecture - Major Parameters of 3G WCDMA Air Interface - Spectrum Allocation for 3G WCDMA - 4G - Long Term Evolution (LTE) System - 4G Architecture of an Evolved Packet System - LTE Integration with Existing 2G/3G Network - Overall Operational Requirements for a 5G Network System - Device Requirements - Capabilities of 5G -Spectrum - 5G System Architecture - General Concepts - Architecture Reference Model.

UNIT V   CELLULAR COMMUNICATION   9

Fundamental concept of Cellular telephone - Frequency reuse, Interference - Co-channel Interference, Adjacent channel Interference - Cell splitting - Cell sectoring - Segmentation and Dualization - Roaming and Handoff.

TOTAL : 45 HOURS

TEXT BOOK

1. Wayne Tomasi, "Electronic Communication Systems Fundamentals through Advanced", 6th Edition, Pearson Education, 2018.

2. Alexander Kukushkinl, "Introduction to Mobile Network Engineering - GSM, 3G-WCDMA, LTE and the Road to 5G" , 1st Edition, Wiley, 2018.

REFERENCES
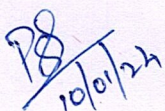
1. H.Taub,D L Schilling ,G Saha ,"Principles of Communication", 3rd edition, 2018.

2. B.P.Lathi,"Modern Analog and Digital Communication systems", 6th edition, Oxford University Press, 2017.

3. Blake, "Electronic Communication Systems", Thomson Delmar Publications, 2018.

4. Martin S.Roden, "Analog and Digital Communication System", 3[rd]edition, PHI, 2016.

5. B.Sklar,"Digital Communication Fundamentals and Applications", 2nd edition, Pearson Education, 2017.

6. Simon Haykin, "Communication Systems", 5[th]edition, John Wiley & Sons. 2018.

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Date: 10-01-2024

U19IT403   DESIGN AND ANALYSIS OF ALGORITHMS   3 0 2 4

COURSE OUTCOMES

At the end of the course, the student will be able to

1. Define algorithm and describe its characteristics.

2. Analyse the algorithmic time complexity for recursive and non-recursive algorithms using different asymptotic notations.

3. Apply the algorithmic techniques - Brute Force, Divide and conquer Decrease and Conquer to different problems and analyse the time complexity.

4. Apply the algorithmic techniques - Transform and conquer, Dynamic Programming and Greedy approach to solve different problems and analyse the time complexity.

5. Explain the algorithm design methods such as backtracking, branch and bound to solve complex problems and express the type of problems as NP, NP-Complete and NP-Hard.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak													
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2					2	1	3		3		
CO2	3	3	3		2		1		1			2		
CO3	2	3	3		3			1				2		
CO4	3	3	2			1				2	3			
CO5	3	2	3	3		1		3			3	3		

UNIT I   BASIC CONCEPTS OF ALGORITHMS   8

Introduction – Notion of Algorithm – Fundamentals of Algorithmic Solving – Important Problem types – Analysis Framework – Asymptotic Notations and Basic Efficiency Classes.

UNIT II   MATHEMATICAL BACKGROUND AND

ANALYSIS OF ALGORITHMS   8

Mathematical Analysis of Non-recursive Algorithm – Mathematical Analysis of Recursive Algorithm – Example: Fibonacci Numbers – Empirical Analysis of Algorithms – Algorithm Visualization.

UNIT III   ANALYSIS OF SORTING AND SEARCHING ALGORITHMS   10

Brute Force – Selection Sort and Bubble Sort – Sequential Search and Brute-force string matching – Divide and conquer – Merge sort – Quick Sort – Binary Search – Decrease and Conquer – Algorithm for generating combinatorial objects.

Date: 10-01-2024

UNIT IV   ALGORITHMIC TECHNIQUES   10

Transform and conquer – Presorting – Analysis of heap sort – Dynamic Programming – Warshall's and Floyd's Algorithm – Optimal Binary Search trees – Greedy Techniques – Approximate bin packing algorithm – Huffman trees.

UNIT V   ADVANCED ALGORITHMIC TECHNIQUES   9

Backtracking – n-Queen's Problem – Hamiltonian Circuit problem – Subset-Sum problem – Branch and bound – Assignment problem – P, NP and NP complete problems – Introduction to approximate algorithms- Approximation algorithms for NP- hard problems -Travelling salesman problem and Knapsack problem.

LECTURE: 45 HOURS   **PRACTICAL : 30 HOURS**   **TOTAL: 75 HOURS**

TEXT BOOK

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education Asia, Third edition, 2011.

REFERENCES

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", 3rd edition, The MIT Press, 2009.

2. Sara Baase and Allen Van Gelder, "Computer Algorithms - Introduction to Design and Analysis", 3rd Edition, Pearson Education Asia, 2009.

3. A. V. Aho, J. E. Hopcroft, and J. D. Ullman, "Data Structures and Algorithms",Pearson Education, 2009.

4. Ellis Horowitz, Sartaj Sahni , Sanguthevar Rajasekaran, "Fundamentals of Computer Algorithms", Galgothia publications, 2013.

List of experiments

1. Practice on estimating the running time of an algorithm

2. Implement algorithms using brute force technique

3. Implement algorithms using divide and conquer technique

4. Implement algorithms using decrease and conquer technique

5. Implement algorithms using transform and conquer technique

6. Implement algorithms using dynamic programming technique

7. Implement algorithms using greedy technique

8. Implement approximation algorithms

Date: 10-01-2024

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10/01/24

COURSE OUTCOMES

At the end of this course, the students will be able to

1. Apply basic features of Java to write programs.

2. Write efficient programs with inheritance, packages, interface and handle different types of exceptions.

3. Apply collection framework for writing efficient programs to solve real time problems.

4. Apply event handling techniques for interaction with GUI based application with multithreaded.

5. Write programs with functional programming, Lambda Expressions and data driven application using JDBC.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	2	1						2		2
CO2	3	2	2	2	2	1						2		2
CO3	3	2	2	2	2	1						2		2
CO4	3	3	3	2	2	1						2		2
CO5	3	2	2		2	1						2		2

UNIT I   CLASS, METHODS AND STRINGS   9

History and Evolution of Java – An overview of Java – Data Types, Variables, and Arrays – Operators – Control Statement – Introducing Class – Methods – String, StringBuffer, StringBuilder.

UNIT II   INHERITANCE, PACKAGE AND INTERFACE AND EXCEPTION HANDLING   9

Inheritance – Packages and Interfaces – Exception Handling Fundamentals – Exception Types – Uncaught Exception – Using try and catch – Multiple catch Clauses – Nested try statements – throw – throws – finally – Built-in Exception – Creating our own Exception class – Chained Exception.

UNIT III   I/O AND THE COLLECTIONS FRAME WORK   9

I/O Basics – Exploring java.io: Stream class, Character Streams – Serialization – The Collection Framework – The ArrayList class – The HashSet class – Working with Maps – The Vector class - Accessing a Collection via an Iterator.

Date: 10-01-2024

UNIT IV   GUI , EVENT HANDLING AND THREADS   9

Introducing Swing – Exploring Swing: JLabel and ImageIcon, JTextField, Swing Buttons, JList, JComboBox, JTable - Event Handling –Threads - Interrupting Threads - Thread States - Thread Properties – Synchronization

UNIT V   DATABASE CONNECTIVITY AND FUNCTIONAL PROGRAMMING 9

JDBC Programming concept – Executing Queries – Scrollable and Updatable Resultset – Auto Boxing – Generics – Lambda Expressions- Functions as First Class Objects – Pure Functions – Higher Order Functions..

TOTAL: 45 HOURS

TEXT BOOK

1. Herbert Schildt, "Java^{TM} : The Complete Reference", 11th edition, Oracle Press, 2018.
2. Anita Seth, B.L.Juneja, " JAVA: One Step Ahead", Oxford University Press, 2017.

REFERENCES
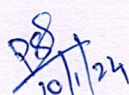
1. Cay S. Horstmann and Gary Cornell, "Core Java: Volume I – Fundamentals", 9th edition, Prentice Hall, 2013.
2. K. Arnold, D. Holmes and J. Gosling, "The JAVA programming language", 4th edition, Addison Wesley Professional, 2005.
3. Timothy Budd, "Understanding Object-oriented programming with Java", 3rd edition, Addison Wesley, 2000.
4. C. Thomas Wu, "An introduction to Object-oriented programming with Java", 5th edition, Tata McGraw-Hill Publishing company Ltd., 2009.

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COURSE OUTCOMES

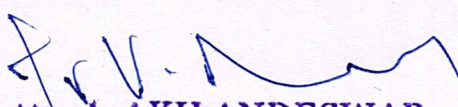At the end of the course, the student will be able to

1. Apply the basic features of JAVA such as Control statements, Arrays, Classes, Inheritance, Interface and Packages in solving a problem

2. Apply appropriate IO stream and collection framework for solving real time problem

3. Write multithreaded and GUI based data driven application using JDBC concepts

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak													
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	3		2					3		3
CO2	3	3	3	2	3		2					3		3
CO3	3	3	3	2	3		2					3		3

LIST OF EXPERIMENTS

1. Write the programs using the concept of nested loops, recursion, arrays, String and StringBuffer class.

2. Write the programs using the concept of Class, Inheritance, Interface and Packages

3. Write a program that uses the I/O package for reading and writing a text file.

4. Write a program that uses the different exception handling mechanism.

5. Write a program that persistently stores the current state of the object.

6. Write a program that uses generic concept for writing efficient program.

7. Write a program that uses different collection class for managing data of different applications.

8. Implementing a GUI based on Swings and Frames. Also, write the program to handle GUI based events.

9. Write the programs that uses the concept of Threads.

10. Write a program that uses JDBC API for interacting with the database.

11. Implement java programs with Lambda Expressions and Functional Programming
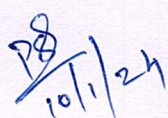
TOTAL: 30 HOURS

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U19IT406   MICROPROCESSORS LABORATORY   1   0   2   2

COURSE OUTCOMES

At the end of the course, the student will be able to

1. Write ALP programs for arithmetic manipulations using Microprocessors.

2. Interface different I/Os with microprocessors and perform arithmetic manipulations using Microcontroller.

3. Solve real time industry based problems with Microprocessors and Microcontrollers.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2		1						1			1
CO2	3	3	3		1						1			2
CO3	3	3	3		1						1			2

UNIT I   MICROPROCESSORS   5

Introduction - 8085 – 8086 Microprocessor- –Register organization of 8086 - Architecture – Signal description of 8086 – Addressing Modes - Instruction Set - Assembly Language Programming

.UNIT II   INTERFACING WITH MICROPROCESSORS   5

Memory interfacing with Microprocessors – Parallel Communication Interface (8255) – Serial Communication Interface (8251) – Timer (8253) - Keyboard/display controller (8279).

UNIT III   MICROCONTROLLER   5

8051 Microcontroller- Architecture – signals descriptions of 8051– Register set of 8051- Addressing modes - Assembly Language Programming.

REFERENCES BOOKS

1. Ramesh S. Gaonkar ,"Microprocessor – Architecture, Programming and Applications with the 8085" Penram International Publisher , 6th Edition, 2018.

Date: 10-01-2024

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2. A.K.Ray & K.M Bhurchandi, "Advanced Microprocessor and Peripherals – Architecture, Programming and Interfacing", 3rd edition, Tata Mc Graw Hill, 2017.

3. Douglas V.Hall and SSSP Rao, " Microprocessors and Interfacing", third edition , Tata Mc Graw Hill ,2016.

4. Yn-cheng Liu,Glenn A.Gibson, "Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design", second edition, Prentice Hall of India , 2018 .

5. Mohamed Ali Mazidi,Janice Gillispie Mazidi," The 8051 microcontroller and embedded systems using Assembly and C", 2nd edition, Pearson education /Prentice hall of India , 2018.

6. Kenneth J.Ayala, "The 8051 microcontroller and Embedded systems using assembly and C", 1st edition, Cengage learning publisher,2017.

LECTURE : 15 HOURS   **PRACTICAL : 30 HOURS**   **TOTAL: 45 HOURS**
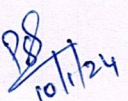
LIST OF EXPERIMENTS

1. 8-bit and 16 bit Manipulations- Addition, Subtraction, Multiplication and Division using Microprocessors.

2. Code conversions - BCD to Binary and Binary to BCD using Microprocessors.

3. Decimal Arithmetic and Bit Manipulation using Microprocessors.

4. Double precision – Addition and subtraction using Microprocessors.

5. 8255 Interface -Experiments with mode 0 and mode1 using Microprocessors.

6. 8279 Interface -Keyboard/ Display Interface with Microprocessors.

7. 8253 Interface -Timer Interface with Microprocessors.

8. 8-bit and 16 bit Manipulations- Addition, Subtraction and Multiplication using 8051.

9. Array Operations-Sum of N Elements using 8051.

10. Applications – Traffic light controller and stepper motor using Microprocessors and Microcontroller.

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Date: 10-01-2024

COURSE CODE	U19GE402		L T P C
COURSE NAME	MANDATORY COURSE:		
	ENVIRONMENT AND CLIMATE SCIENCE		2 0 0 0

Course outcome:

Upon completion of this course the students will be able to

CO1 Describe the importance of the acute need for environmental awareness and discuss significant aspects of natural resources like forests, water and food resources.

CO2 Illustrate the concepts of an ecosystem and provide an overview of biodiversity and its conservation.

CO3 Analyze the causes, effects of various environmental pollution and their appropriate remedial measures.

CO4 Provide solutions to combat environmental issues like global warming, acid Rain, ozone layer depletion.

CO5 Analyze the effect of climate change in various sectors and their remedial measures.

CO / PO, PSO Mapping														
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
COs, POs PSOs Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO – 1	3	2				2	2							-
CO – 2	2	-												-
CO – 3	3	2				2	2							2
CO – 4	3	2				2	2							2
CO - 5	3	2				2	2							2

Unit I   INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES   L 6

Definition, Scope and Importance Forest Resources: - Use and over - exploitation, deforestation, Case Studies, Water Resources: - Use and Over-Utilization of Surface and ground water, Floods, Drought, Food Resources- Effects of Modern Agriculture, Fertilizer- Pesticide Problems–Role of an Individual in Conservation of Natural Resources.

Unit II   ECOSYSTEMS AND BIODIVERSITY   L 6

Structure and Function of an Ecosystem– Energy Flow in the Ecosystem -Food Chains, Food Webs and Ecological Pyramids. Introduction to Biodiversity –Value of Biodiversity: Consumptive Use, Productive Use, Social, Ethical, Aesthetic and Option Values –India as a Mega-Diversity Nation –– Threats to Biodiversity: Habitat Loss, Poaching of Wildlife, Man-Wildlife Conflicts – Endangered and Endemic Species of India – Conservation of Biodiversity: In-Situ and Ex-Situ conservation of Biodiversity.

Unit III   ENVIRONMENTAL POLLUTION

L 6

Definition – Causes, Effects and Control Measures of:-(A) Air Pollution(B) Water Pollution (C) Soil Pollution (D) Marine Pollution (E) Noise Pollution (F) Thermal Pollution, Solid Waste Management- Effects and Control Measures of Acid Rain,– Role of an Individual in Prevention of Pollution.

Unit IV   FUNDAMENTALS OF CLIMATE CHANGE

L 6

Sustainable Development- - Climate Change-Causes and effects of Global Warming - Effect of global warming in food supply, plants, sea, coral reef, forest, agriculture, economy- Kyoto Protocol in reduction of greenhouse gases - Ozone Layer Depletion-mechanism, effects and control measures Montreal Protocol to protect ozone layer depletion -Rain Water Harvesting - .Effect of climate change due to air pollution Case study - CNG vehicles in Delhi.

Unit V   EFFECT OF CLIMATE CHANGE

L 6

Fungal diseases in forests and agricultural crops due to climatic fluctuations - Growing energy needs - effect of climate change due to non-renewable energy resources. Renewable energy resources in the prevention of climatic changes- Effect of climatic changes in ground water table, garments, monuments, buildings, consumption of energy, agriculture and in electric power sector - Carbon credit - carbon footprint - disaster management -Role of an individual to reduce climate change.

Total Number of hours: 30

Learning Resources

Text Book:

1. Miller, T.G. Jr., "Environmental Science", Wadsworth Pub. Co. 2018 2. Anubha Kaushik and Kaushik,

2. "Environmental Science and Engineering" New Age International Publication, 4thMulticolour Edition, New Delhi, 2014.

Reference Books:

1. S. Radjarejesri et al., "Environmental Science" Sonaversity, Sona College of Technology, Salem, 2018.

2. Masters, G.M., "Introduction to Environmental Engineering and Science", Pearson Education Pvt., Ltd., 2nd Edition, 2004.

3. Erach, B., "The Biodiversity of India", Mapin Publishing P.Ltd.,Ahmedabad, India.

4. ErachBharucha, "Textbook of Environmental Studies for Undergraduate Courses", 2005, University Grands Commission, Universities Press India Private Limited, Hyderguda, Hyderabad – 500029.

22|12|2023

Dr.C.SHANTHI, M.Sc.,M.E.,Ph..
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22|12|'23.

Dr. M.RENUGA,
Professor & Head,
Department of Humanities & Languages,
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Semester – IV	U19GE401 - SOFT SKILLS AND APTITUDE – II	L	T	P	C	Marks
		0	0	2	1	100

Course Outcomes

At the end of the course the student will be able to:

1. Demonstrate capabilities in additional soft-skill areas using hands-on and/or case-study approaches
2. Solve problems of increasing difficulty than those in SSA-I in given areas of quantitative aptitude and logical reasoning and score 65-70% marks in company-specific internal tests
3. Demonstrate greater than SSA-I level of verbal aptitude skills in English with regard to given topics and score 65-70% marks in company-specific internal tests

1. Soft Skills	**Demonstrating soft-skill capabilities with reference to the following topics:** a. SWOT b. Goal setting c. Time management d. Stress management e. Interpersonal skills and Intrapersonal skills f. Presentation skills g. Group discussions
2. Quantitative Aptitude and Logical Reasoning	**Solving problems with reference to the following topics:** a. Equations: Basics of equations , Linear, Quadratic Equations of Higher Degree and Problem on ages. b. Logarithms, Inequalities and Modulus c. Sequence and Series: Arithmetic Progression, Geometric Progression, Harmonic Progression, and Special Series. d. Time and Work: Pipes & Cistern and Work Equivalence. e. Time, Speed and Distance: Average Speed, Relative Speed, Boats & Streams, Races and Circular tracks and Escalators. f. Arithmetic and Critical Reasoning: Arrangement, Sequencing, Scheduling, Network Diagram, Binary Logic, and Logical Connection. g. Binary Number System.- Binary to decimal, Octal, Hexadecimal
3. Verbal Aptitude	**Demonstrating English language skills with reference to the following topics:** a. Critical reasoning b. Theme detection c. Verbal analogy d. Prepositions e. Articles f. Cloze test g. Company specific aptitude questions

Total: 30 Hours

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