

B.Sc. COMPUTER SCIENCE

SYLLABUS - 2017

SCHOOLS OF EXCELLENCE

with

CHOICE BASED CREDIT SYSTEM (CBCS)

SCHOOL OF COMPUTING SCIENCES

St. JOSEPH'S COLLEGE (Autonomous)

Special Heritage Status Awarded by UGC

Accredited at "A" Grade (3rd cycle) by NAAC

College with Potential for Excellence Conferred by UGC

DBT-STAR & DST-FIST Sponsored College

TIRUCHIRAPPALLI - 620 002, INDIA

**B.Sc. COMPUTER SCIENCE
COURSE PATTERN - 2017 SET**

Sem	Part	Code	Course	Hrs.	Crs.	
I	I	Language	17UGT110001	Language – I (Tamil / Hindi / French / Sanskrit)	4	3
	II	English	17UGE120101	General English - I	5	3
	III	Core	17UCS130201	Problem Solving using C	5	3
			17UCS130202	Digital Computer Fundamentals	5	3
			17UCS130203	Software Lab–I (Problem Solving using C)	3	2
		Allied	17UCS130401	Allied I: Mathematics I	6	4
	IV	NMC	17UCE140801	Communicative English	-	5
		V. Edn.	17UFC141001	Essentials of Humanity	2	2
Total for Semester I				30	25	
II	I	Language	17UGT210002	Language – II (Tamil, Hindi, French, Sanskrit)	4	3
	II	English	17UGE220102	General English – II	5	3
	III	Core	17UCS230204	Programming in C++	4	3
			17UCS230205	Discrete Mathematics	4	3
			17UCS230206	Software Lab–II (C++)	3	2
		Allied	17UCS230402	Allied I: Mathematics II	6	4
	IV	NMC	17UCE240802A	Computer Literacy	2	2
		V. Edn.	17UFC241002	Fundamentals of Human Rights	2	2
Total for Semester II				30	22	
III	I	Language	17UGT310003	Language – III (Tamil / Hindi / French / Sanskrit)	4	3
	II	English	17UGE320103	General English – III	5	3
	III	Core	17UCS330207	Database Systems	4	3
			17UCS330208	Systems Analysis and Design	4	3
			17UCS330209	Software Lab–III(RDBMS)	3	2
	III	Allied	17UCS330403A	Allied II: Applied Physics I	4	4
			@	Applied Physics Practical – I / (or)	2	@
			17UCS330403B	Allied II: Principles of Electronics	4	4
			@	Electronics Practical – I	2	@
	IV	NMC/EVS	17UCE340901	Environmental Studies (Partial online course)	2	2
		V. Edn.	17UFC341003A	Formation of youth –I OR		
			17UFC341003B	Religious Doctrine- I	2	2
Total for Semester III				30	22	

IV	I	Language	17UGT410004	Language – IV (Tamil / Hindi / French/ Sanskrit)	4	3
	II	English	17UGE420104	General English – IV	5	3
	III	Core	17UCS430210	Data Structures and Algorithms	5	3
			17UCS430211	Software Lab – IV (Data Structures using C and C++)	4	3
		Core Elec. I (WD)	17UCS430301A	Micro Computer Architecture OR	4	4
			17UCS430301B	Design and Analysis of Algorithms OR		
			17UCS430301C	Business Process Outsourcing		
		Allied	17UCS430404A	Allied II: Applied Physics II OR	4	4
			17UCS430405A	Applied Physics Practical II OR	2	2
	17UCS430404B		Allied II: Communication Electronics	4	4	
17UCS430405B	Electronics Practical II		2	2		
IV	V. Edn.	17UFC441004 A	Formation of youth –II OR	2	2	
		17UFC441004 B	Religious Doctrine- II			
Total for Semester IV					30	24
V	III	Core	17UCS530212	Programming in Java	4	3
			17UCS530213	Distributed Technologies	4	3
			17UCS530214	LAMP	5	4
			17UCS530215	Software Lab–V (Java)	3	2
			17UCS530216	Software Lab–VI (LAMP)	3	2
				Hardware Lab	3	*
		Core Ele.II (WS)	17UCS530302A	XML OR	4	4
	17UCS530302B		Ruby on Rails			
	Addl.core	17UCS530501A	Software Testing	-	(2)	
		17UCS530501B	MATLAB OR			
	SPL (POC)	17UCS530217	Python Programming	-	2	
	IV	SBE (BS)	17UCS540601A	Desktop Publishing Tools OR	2	2
			17UCS540601B	Multimedia I		
IDC		17USS540701A	Soft Skills	2	2	
		17USS540701B	National Cadet corps (For NCC cadets)			
Total for Semester V					30	24
VI	III	Core	17UCS630218	Computer Networks	5	3
			17UCS630219	Operating Systems	5	3
			17UCS630220	Operations Research	5	3
			17UCS630221	Software Lab – VII: Distributed Technologies	3	2
			17UCS630222	Hardware Lab (Electronics)	3	4
			17UCS630223	Comprehensive Examination	-	2
			17UCS630224	Internship	-	2
			17UCS630225	Project	3	3
	Core Elec.III (WS)	17UCS630303A	Computer Graphics OR	4	4	
		17UCS630303B	Web Graphics			
	Addl.core	17UCS630502A	Shell Programming	-	(2)	
17UCS630502B		Smart Device Programming				
IV	SBE (WS)	17UCS640602 A	E-Commerce	2	2	
		17UCS640602 B	Multimedia II			
Total for Semester VI					30	28
I-V	V	Shepherd	17UCW651101	Community Service Work (SHEPHERD) & Gender Studies		5
Total for all semesters					180	150+ 4

பொதுத்தமிழ் - 1

கற்றலின் உறுதிப்பாடு

1. சமூகமாற்றச் சிந்தனைகளை உள்ளடக்கியதற்காலஇலக்கியப்பரப்பை அறிதல்
2. புதுக்கவிதை, சிறுகதை உரைநடை ஆகியவற்றின் இலக்கியத்திறன் கண்டறிதல்.
3. சந்திப்பிழையின்றி எழுதும் திறன் பெறுதல்

அலகு-1 மகாகவி பாரதியார் கவிதைகள்
பாரதிதாசன் கவிதைகள்
நாமக்கல் கவிஞர் கவிதைகள்
உரைநடை- முதல் மூன்று கட்டுரைகள் (12மணி நேரம்)

அலகு-2 பாவலரேறு பெருஞ்சித்திரனார் பாடல்கள்
கண்ணதாசன் கவிதைகள்
இலக்கியவரலாறு (பக். 239- 300)
இலக்கணம் -வலிமிகும் இடங்கள் (14மணி நேரம்)

அலகு-3 சமூகக்கவிதைகள்
இலக்கியவரலாறு (பக்.300 -362)
சிறுகதை முதல் ஆறு சிறுகதைகள் (14மணி நேரம்)

அலகு-4 அரசியல் கவிதைகள்
இலக்கணம் - வலி மிகா இடங்கள் (10மணி நேரம்)

அலகு-5 மொழிபெயர்ப்புக்கவிதைகள்
சிறுகதை 7 முதல் 12 முடிய உள்ள சிறுகதைகள்
உரைநடை- 4 முதல் 6 முடிய உள்ள கட்டுரைகள் (10மணி நேரம்)

பாடநூல்

1. பொதுத்தமிழ்- செய்யுள் திரட்டு- தமிழாய்வுத்துறை வெளியீடு-2017 -2020
2. சமூகவியல் நோக்கில் தமிழ் இலக்கியவரலாறு, தமிழாய்வுத்துறை வெளியீடு, தூயவளனார் கல்லூரி திருச்சிராப்பள்ளி-2
3. உரைநடை நூல் - தமிழாய்வுத்துறை வெளியீடு.
4. சிறுகதைத்தொகுப்பு : (நாட்டுடைமையாக்கப்பட்ட படைப்பாளர்களின் சிறுகதைகள்), தமிழாய்வுத்துறை வெளியீடு.

Semester: I
17UGH110001

Hours/Week: 4
Credits: 3

HINDI PAPER – I

Assurance of Learning

- To enable the students to develop their effective communicative skills in Hindi.
- To introduce the socially relevant subjects in Modern Hindi Literature
- To appreciate the features of Modern Hindi Prose.

UNIT – I

8 hours

Dr Abdul Kalam, Ling Badaliye, Vachan Badaliye, Baathcheeth-Aspathal Mein

UNIT – II

12 hours

Hamara Rajchinha, Noun Ling, Kaarak Chinha, Chaar Baayee, Baathcheeth, Dookan Mein

UNIT – III

12 hours

Moun hee mantra hai, Vachan, Kaarak, Vishwamitra Ka yagna, Baathcheeth, Hotel mein

UNIT – IV

14 hours

Veer Shivaji, Pronoun, Danush Yagna, Baathcheeth-Maidaan mein

UNIT – V

14 hours

Rajatilak Kee Thaiyaree, Adjectives, Baathcheeth-Pareeksha ke baare mein

Books Recommended

1. Dakshina Bharathi Hindi Prachar Sabha, Thiagaraya Nagar, Chennai – 600 017, Subhodh Hindi Patamala-2, Bharath Milap, Bharath-1, 2016.
2. Ramdev, Vyakaran Pradeep, Hindi Bhavan, 63, Tagore Nagar, Allahabad 2, 2016.

Semestre: I
17UGF110001

Heures /Semaine: 4
Points : 3

FRANÇAIS – I

Assurance of Learning

- Introduire la langue et la culture française aux étudiants
- I Comparer la culture de l'Inde et de la France
- Familiariser l'étudiant avec le vocabulaire, la grammaire et les conversations

UNIT I : A l'aéroport Kamaraj domestic de Chennai

(10 heures)

Saluer, demander et dire le nom, présenter quelqu'un, se présenter, souhaiter la bienvenue a quelqu'un, demander et dire l'identité de quelqu'un.

Grammaire : Etre, s'appeler, pronoms sujets, interrogation

UNIT II : A l'Université

(10 heures)

Demander comment on se porte, présenter quel qu'un, prendre congé, exprimer, l'appréciation.

Grammaire : Articles définis et indéfinis, genre des noms, adjectifs, présent de l'indicatif : verbes réguliers en er, être avoir, apprendre, prépositions a, en, au, aux.

UNIT III : Au café

(10 heures)

Dire ce qu'on aime, donner des informations, exprimer l'admiration, demander des informations sur quelqu'un.

Grammaire : Adjectifs interrogatifs, présent de l'indicatif : avoir, verbes en er , savoir, qu'est ce que c'est?, adjectifs possessifs, négation ,adjectifs irréguliers

UNIT IV : A la plage

(15 heures)

Proposer une sortie, accepter, refuser la proposition

Grammaire : phrases au singulier et au pluriel, pronom indéfini- on, il y a, adjectifs démonstratifs, négation, interrogation, présent de l'indicatif : faire, voir, aller, sortir, connaître

UNIT V : Un concert et chez Nalli (15 heures)

Inviter, accepter, exprimer son incapacité d'accepter, complimenter, parlé au téléphone, demander le prix, protester contre le prix.

Grammaire : Présent de l'indicatif : verbes en er, venir, pouvoir, vouloir, articles contracte, avec, a chez, le futur, interrogation est ce que, adverbes interrogatifs, adjectifs possessifs, accord de l'adjectif, adjectifs exclamatifs, très/trop, présent de l'indicatif : acheter-regarder, l'impératif.

Manuel :

1. K.Madanagobalane, **Synchronie-1**, Samhitâ Publication, 2011.

Livre de référence :

1. Annie Berthet /B_atrix Sampsonis/ Catherine Hugot /V_ronnique M Kizirian / Monique Waendendries, **Alter Ego A1**, Hachette, 2006.
2. Yves Loiseau/R_gineM_rieux, Connexions 1, Didier, 2011.

Semester: I
17UGS110001

Hours/week: 4
Credits: 3

SANSKRIT PAPER – I

Assurance of Learning

- To introduce Sanskrit Aksharas.
- To improvise the writing skills.
- To introduce Present tense forms

UNIT – I

8 hours

Akharavivaranam – Svaras & Vyanjanaani – Samyukta Aksharani.

UNIT –II**12 hours**

Shabdadayah – Aakaaraanta, ikaar aantah. ukaaraantah.

Shabdadayah – Aakaaraanta, iikaar aantah. uukaaraantah.

UNIT – III**12 hours**

Anuvaada Prayogah.

UNIT – IV**14 hours**

Lat Lakarh – Parasmai – Pada Prayogah = Vakyarupah.

UNIT – V**14 hours**

Subhaashitaani

Books Recommended

1. Kulapathy, K. M., Saral Sanskrit Balabodh, Bharathiya Vidya Bhavan, Munshimarg, Mumbai-400 007, 2014
2. R.S. Vadhyar & Sons, Book-Sellers and Publishers, Kalpathi, Palghat- 678003, Kerala, South India, Shabdha Manjari, 2014
3. Balasubramaniam R., Samskrita Akshara Siksha, Vangals Publication, 14th Main Road, JP Nagar, Bangalore -78, 2015.

Sem-I**Hours/Week: 5****17UGE120101****Credits: 3****GENERAL ENGLISH-I****Assurance of Learning**

To help students

- use words and phrases related to self, home, friends and relatives in meaningful contexts
- develop positive self-esteem and thereby communicate confidently
- use language to perform basic functions like describing, clarifying, suggesting, and giving directions

Unit-I:

01. Personal Details
02. Positive Qualities
03. Listening to Positive Qualities
04. Relating and Grading Qualities
05. My Ambition
06. Abilities and Skills
07. Self-Improvement Word Grid
08. What am I doing?
09. What was I doing?
10. Unscramble the Past Actions
11. What did I do yesterday?

Unit-II:

12. Body Parts
13. Actions and Body Parts
14. Value of Life
15. Describing Self
16. Home Word Grid
17. Unscramble Building Types
18. Plural Form of Naming Words
19. Irregular Plural Forms
20. Plural Naming Words Practice
21. Whose Words?

Unit-III:

22. Plural Forms of Action Words
23. Present Positive Actions
24. Present Negative Actions
25. Un/Countable Naming Words
26. Recognition of Vowel Sounds
27. Indefinite Articles
28. Un/Countable Practice
29. Listen and Match the Visual
30. Letter Spell - Check
31. Drafting Letter

Unit-IV:

32. Friendship Word Grid
33. Friends' Details
34. Guess the Favourites
35. Guess Your Friend
36. Friends as Guests
37. Introducing Friends
38. What are We Doing?
39. What is (s)he / are they Doing?
40. Yes / No Question
41. What was s/he doing?
42. Names and Actions
43. True Friendship
44. Know your Friends
45. Giving Advice/Suggestions
46. Discussion on Friendship
47. My Best Friend

Unit-V:

48. Kinship Words
49. The Odd One Out
50. My Family Tree
51. Little Boy's Request
52. Occasions for Message
53. Words denoting Place
54. Words denoting Movement
55. Phrases for Giving Directions
56. Find the Destination
57. Giving Directions Practice
58. SMS Language
59. Converting SMS
60. Writing Short Messages
61. Sending SMS
62. The family debate
63. Family Today

Textbook

Joy, J.L. & Peter, F.M. *Let's Communicate 1*, New Delhi, Trinity Press, 2014. Print.

Extensive Reader

Dodd, E F. *Six Tales From Shakespeare*. London: Macmillan, 1987. Print. (First three tales)

Sem. I
17UCS130201

Hours/Week: 5
Credits: 3

PROBLEM SOLVING USING 'C'

Assurance of Learning: After learning this course, the learner would have acquired

- the knowledge of problem solving techniques
- the required abilities of programming skills
- the knowledge of the special features of 'C' for programming

Unit – I: **(15 hours)**

Algorithms - Flow charts - Developing algorithms and flowcharts for solving simple problems using sequential, selection and iterative programming Structures.

Unit – II: **(15 hours)**

Structure of a C program - Data Types – Constants and Variables – Operators and Expressions - Control structures - Looping structures.

Unit – III: **(15 hours)**

Arrays - Functions - Built-in-functions - User defined functions - Scope of Variables - Passing Arrays to function - Strings.

Unit – IV:**(15 hours)**

Pointers: Introduction - Pointer Array - Pointer Arithmetic - Pointer of Pointer - Functions and Pointers - Call by value and call by reference - Structures and Pointers - Dynamic Allocation - Function pointer.

Unit – V:**(15 hours)**

Type modifiers and storage class specifier - Structures – Basics of structures – Declaration of structure – Referencing Structures elements - Array of Structures – Nesting of structures - Passing Structures to function – Union.

BOOK(S) FOR STUDY**Unit I**

1. S. Jaiswal, “Information Technology Today”, Galgotia Publications, First Edition, 1999. New Delhi, Seventh Edition, 2016.

Unit II, III, IV, V

2. E. Balagurusamy, “Programming in ANSI C”, Tata McGraw Hill, New Delhi, Seventh Edition, 2016.

BOOK(S) FOR REFERENCE

1. Byron S. Gottfried, “Programming with C”, Schaum’s Outline Series, Tata-McGraw Hill Edition, New Delhi, 1991.
2. Yashavant Kanetkar, “Let us C”, BPB Publications, Tenth Edition - New Delhi: 2010.
3. Brian W. Kernighan, Dennis M. Ritchie, “The C Programming Language”, Prentice Hall of India Pvt. Ltd., New Delhi, 1989.
4. E. Karthikeyan, “A Textbook on C Fundamentals, Data Structures and Problem Solving”, Prentice-Hall of India Private Limited, New Delhi- 110001, 2008.

DIGITAL COMPUTER FUNDAMENTALS

Assurance of Learning:

After learning this course, the learner would have

- good understanding of the Digital number system and their conversions
- understood the logic of Gates and Boolean Laws
- learnt the functioning of Arithmetic and Data Processing Circuits
- understand the Fundamental memory units like Flip-flops, Registers and RAM

Unit – I: (15 hours)

Number Systems: Number systems - Decimal, Binary, Octal, Hexadecimal - conversion from one to another. Characters and codes: ASCII code, Excess-3 code, gray code - binary addition, subtraction, multiplication and division - unsigned binary numbers - signed magnitude numbers - complements in number systems

Unit – II: (15 hours)

Logic Gates: AND, OR, NOT, NOR & NAND gates, EX-OR gates. Boolean Algebra and Boolean laws and theorems: De Morgan's theorems - Duality theorem - simplification of sum of product and product of sum expressions - Karnaugh map and simplifications.

Unit – III: (15 hours)

Simple arithmetic circuits: Half and Full adders - Binary adder/subtractor - BCD adder Data processing circuits: Multiplexers - Demultiplexers - Encoders and Decoders.

Unit – IV: (15 hours)

Sequential Logic Design: Flip-flops - RS, JK, D & T Flip flops - Master / Slave Flip flop - Shift Registers - Counters - Asynchronous and Synchronous Counters.

Unit – V: (15 hours)

Memory Elements: RAM - static RAM - Dynamic RAM - ROM - Magnetic Disk memories - Magnetic tape - Cache Memory.

BOOK (S) FOR STUDY

1. Donald P. Leach and Albert Paul Malvino, “Digital Principles and Application”, Fifth Edition, Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2003. (Units: I-IV)
2. Thomas C. Bartee, “Computer Architecture and Logic Design”, McGraw Hill International Edition, New Delhi, 1991. (Unit: V)

BOOK (S) FOR REFERENCE

1. Virendra Kumar, “Digital Technology Principles and Practice”, New Age International, New Delhi, 2006.
2. Jaydeep Chakravorty, “Digital Electronics and Logic Design”, Universites Press, 2012, ISBN : 8173717613

Sem. I
17UCS130203

Hours/Week: 3
Credits: 2

Software Lab-I **PROBLEM SOLVING USING ‘C’**

1. Simple problems using Operators
2. Problems using Branching structures (If, switch, goto)
3. Problems using looping structures (for, while, do-while)
4. Problems on operations on single dimensional array
5. Problems using Matrix operations
6. Problems using String manipulations (Using Array)
7. Problems on Working with functions
8. Problems on Working with Recursive Functions
9. Problems on Working with Pointers
10. Problems on Working with Structures

Sem. I
17UCS130401

Hours/Week: 6
Credits: 5

Allied: MATHEMATICS-I

Assurance of learning

1. Solving simultaneous linear equations using matrices.
2. Understanding the importance of solving differential equations in

- industry related problems.
3. Ability to solve the problems in series.
 4. Understand the application of Laplace transform.
 5. Apply Fourier series to express a continuous functions.

Unit I: Matrices and Determinants (18 hours)

Solutions of system of linear equations - Using Cramer's rule- Rank of a matrix using linear independence and dependence - Eigen values and Eigen vectors of a matrix - Cayley Hamilton's Theorem (Without proof). (Chapter I, Section 1.20-1.23, Chapter III, Section 3.1- 3.5 and Chapter V, Section 5.1- 5.4, 6.3)

Unit II: Differential Equations (18 hours)

Second order differential equations - all the types of equations with constant coefficients. (Chapter V, Sections 47-60s). Partial Differential Equation: Formation- General, singular, particular integrals- standard forms-Lagrange's form $Pp + Qq = R$. (Chapter VI Section 1-6)

Unit III: Series (18 hours)

Concept of limit of a function - simple problems- convergence, divergence and oscillation of a series- geometric series - test of convergence and divergence, comparisons ratio and root test (without proof). (Chapter VI, Section 1-14)

Unit IV: Laplace Transforms (18 hours)

Definition- properties- the inverse transforms- solving differential equations using Laplace transforms (Chapter IV Section 1-5)

Unit V: Fourier Series (18 hours)

Fourier series - Even and odd functions - properties of odd and even functions - Half range Fourier series (Omitting general interval). (Chapter IV, Sections 1-5.2)

TEXTBOOKS

1. Venkataraman, M.K., “Engineering Mathematics” (Vol II) Third Edition, The National Publishing Co., Madras, 1988. (Full for Unit I & II)
2. Venkataraman, M.K., “Higher Mathematics for Engineering and Science”, Third Edition, The National Publishing Co., Madras, 1986. (For Unit III)
3. Narayanan and Manickavachagam Pillai, “ Ancillary Maths” Book II, S. Viswanathan Pvt. Ltd., Madras (For unit IV & V).

REFERENCES

1. S.Narayanan, R.Hanumantha Rao, T.K.Manicavachagom pillay,”Ancillary Mathematics” Volume-I-2009 edition.
2. S.Narayanan & T.K.Manichavachagom Pillay,”Differential equation and its applications”, S.Viswanathan pvt.Ltd.2001.
3. S.Narayanan, R.Hanumantha Rao, T.K.Manicavachagom Pillay, Ancillary Mathematics”,volume-II- 2010 edition.

Semester-I
17UFC141001

Hours/Week: 2
Credits: 2

ESSENTIALS OF HUMANITY

Assurance of Learning

- * To educate the students in the basic principles of value education and to inculcate the same values in them
- * To teach the students various dimensions of human personality and the ways to develop them.
- * To empower the students in gender sensitization, gender differences and gender roles.
- * To prepare the students for the smooth transfer from the stage of teenage to earlier adulthood.

Unit-I

Principles of Value Education - Introduction - Value Education-
Characteristics of Values –
Kinds of Values

Unit-II

Development of Human Personality - Personality traits - Theories
of Personality - Discovering self- Defense mechanism - Power of positive
thinking

Unit-III

Dimensions of Human Development - Physical development –
Intellectual development - Emotional development - Social Development
– Moral development - Spiritual development

Unit-IV

Responsible Parenthood - Human sexuality - Sex and love - Becoming
a spouse - Responsible Parenthood

Unit-V

Gender Equality and Empowerment - Historical perspective -
Education & economic development -Crimes against Women-Women's
rights

Text Book:

Essentials of Humanity, Department of Foundation course, St.Joseph's
College, Tiruchirappalli-2, 2016.
