Curriculum of

Bachelor of Computer Applications

After Revision

2023-2024

Bharathidasan University

Centre for Differently Abled Persons
Tiruchirappalli-620 023
Tamil Nadu, India

Bachelor of Computer Applications

Regulations and Syllabi for the BCA Programme
For the candidates admitted from the academic year
2023-2024 onwards

BCA - Programme Structure under CBCS

(For the Candidates admitted from the Academic year 2023-2024 onwards)

SEM	Course Code	Part	Course	Sub order	Title	In hrs / week	Credits	Marks		Total
								CIA	ESE	
1	23UCACL01	1	Tamil - I	LC	தமிழ் இலக்கிய வரலாறு -1	5	3	25	75	100
	23UCAGE01	2	English - I	ELC	General English and Indian Sign Language - I	5	3	25	75	100
	23UCACC01	3	Core Course - I	CC	Programming in C	6	5	25	75	100
	23UCALC01		Core Practical - I	CP	Programming in C Lab	5	5	40	60	100
	23UCAEC01A/ 23UCAEC01B		Elective Course - I	EC	Discrete Mathematics / Optimization Techniques	5	3	25	75	100
	23UCASEC01	4	Skill Enhancement Course - I	SEC	Fundamentals of Information Technology Lab	2	2	40	60	100
	23UCAVE		Value Education		Value Education	2	2	25	75	100
	Total					**30**	**23**			**700**
2	23UCACL02	1	Tamil – II	LC	தமிழ் இலக்கிய வரலாறு - 2	5	3	25	75	100
	23UCAGE02	2	English - II	ELC	General English - II	5	3	25	75	100
	23UCACC02	3	Core Course - II	CC	Python Programming	5	5	25	75	100
	23UCALC02		Core Practical - II	CP	Python Programming Lab	5	5	40	60	100
	23UCA EC02A/ 23UCAEC02B		Elective Course - II	EC	Statistical Methods and its Application / Numerical Methods	4	3	25	75	100
	23UCA SEC02	4	Skill Enhancement Course - II	SEC	Advanced Excel Lab	2	2	40	60	100
	23UCA SEC03		Skill Enhancement Course - III	SEC	Computer Graphics lab	2	2	40	60	100
	23UCAES01		Environmental Studies		Environmental Studies	2	2	25	75	100
	Total					**30**	**25**			**800**
3	23UCACL03	1	Tamil – III	LC	தமிழக வரலாறும் பண்பாடும்	5	3	25	75	100
	23UCAGE03	2	English - III	ELC	General English - III	5	3	25	75	100
	23UCACC03	3	Core Course - III	CC	Data Structures and Algorithms	5	5	25	75	100
	23UCALC03		Core practical - III	CP	Data Structures and Algorithms Lab	5	5	40	60	100
	23UCA EC03A / 23UCA EC03B		Elective Course - III	EC	Financial Accounting / Cost and Management Accounting	4	3	25	75	100
	23UCA SEC04	4	Skill Enhancement Course - IV	SEC	Animation lab	2	2	40	60	100
	23UCA SEC05		Skill Enhancement Course - V	SEC	Open Source Software Technologies	2	2	25	75	100
	23UCANMEC01		Non Major Elective - I	NME	Yoga Practices	2	2	40	60	100
	Total					**30**	**25**			**800**
4	23UCACL04	1	Tamil – IV	LC	தமிழும் அறிவியலும்	5	3	25	75	100
	23UCAGE04	2	English - IV	ELC	General English - IV	5	3	25	75	100
	23UCACC04	3	Core Course -IV	CC	Programming in Java	5	5	25	75	100
	23UCALC04		Core Practical- IV	CP	Programming in Java Lab	5	5	40	60	100
	23UCA EC04A/ 23UCAEC04B		Elective Course - IV	EC	Database Management Systems / Digital Logic Fundamentals	4	3	25	75	100
	23UCA SEC06	4	Skill Enhancement Course - VI	SEC	Web Designing Lab	2	2	40	60	100
	23UCA SEC07		Skill Enhancement Course - VII	SEC	Quantitative Aptitude	2	2	25	75	100
	23UCANMEC02		Non Major Elective - II	NME	Advanced Accounting Package Lab	2	2	40	60	100
	Total					**30**	**25**			**800**

5	23UCA CC05	3	Core Course – V	CC	Operating Systems	5	4	25	75	100
	23UCA CC06		Core Course -VI	CC	Software Engineering	5	4	25	75	100
	23UCALC05		Core Practical- V	CP	ASP.Net Programming Lab	5	4	40	60	100
	23UCAEC05A/ 23UCAEC05B		Elective Course - V	EC	Human Computer Interaction / Agile Project management	4	3	25	75	100
	23UCAEC06A/ 23UCAEC06B		Elective Course - VI	EC	Cloud Computing / Grid Computing	4	3	25	75	100
	23UCAI/ 23UCAIT	4			Internship / Industrial Training	-	2	40	60	100
	23UCASK01		Soft skill Development		Soft skill Development	2	2	25	75	100
	Total					**30**	**22**			**700**
6	23UCA CC07	3	Core Course – VIII	CC	Computer Networks	5	4	25	75	100
	23UCACC08		Core Course – IX	CC	Data Analytics using R Programming	5	4	25	75	100
	23UCALC06		Core Practical-VI	CP	R Programming Lab	5	4	40	60	100
	23UCAEC07A/ 23UCAEC07B		Elective Course - VII	EC	Analytics for Service Industry / Artificial Intelligence	4	3	25	75	100
	23UCAEC08A/ 23UCAEC08B		Elective Course - VIII	EC	IoT and its applications Lab / Image Processing Lab	4	3	40	60	100
	23UCACP01				Project	5	4	40	60	100
	23UCASEC08	4	Skill Enhancement Course - VIII	SEC	Software Testing lab	1	2	40	60	100
	23UCAGS01	5	Gender studies		Gender studies	1	1	25	75	100
	Total					**30**	**25**			**800**
Part – 5			Extension and Extra-Curricular Activities			1	1	-	-	-
Grand Total							**146**			**4600**

SEM	Course Code	Part	Course	Sub order	Title	In hrs / week	Credits	Marks		Total
								CIA	ESE	
2	23UCANMS01	6	Naan Mudhalvan Scheme	NMS	Language Proficiency for employability – Effective English		2	25	75	100
4	23UCANMS02	6	Naan Mudhalvan Scheme	NMS	Digital Skills for employability		2	25	75	100
6	23UCANMS03	6	Naan Mudhalvan Scheme	NMS	Emerging Technology for Workplace - I		2	25	75	100

PROGRAMME EDUCATIONAL OBJECTIVES

The objectives of the Bachelor of Computer Applications (**BCA) Programme is to;**

- Serve as a preparatory course for advanced studies in the field of Computer Science/Applications.
- Engage the younger generation to tap into their existing knowledge and skills in computer hardware, software, and networks.
- Enhance the software development abilities of BCA graduates, so as to equip them with the ability to pursue self-employment opportunities in both the Indian and global software markets.
- Develop into a conscientious individual possessing leadership attributes in order to enhance the economic prowess of India within the realm of information technology.
- Employ analytical and computational methodologies to confront and address difficulties with courage and determination.
- Contribute to scientific and societal progress by means of technical innovation and strive to achieve success as an entrepreneur.

PROGRAMME OUTCOMES (PO's)

After the successful completion of BCA program, the students shall be

PO1: **Disciplinary knowledge:** Capable to apply the knowledge of mathematics, algorithmic principles and computing fundamentals in the modeling and design of computer based systems of varying complexity.

PO2: Scientific reasoning/ Problem analysis: Able to critically analyze, categorizes, formulate and solve the problems that emerges in the field of computer science.

PO3: Problem solving: Able to provide software solutions for complex scientific and business related problems or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural, societal and environmental considerations.

PO4: Environment and sustainability: Understand the impact of software solutions in environmental and societal context and strive for sustainable development.

PO5: Modern tool usage: Use contemporary techniques, skills and tools necessary for integrated solutions.

PROGRAM SPECIFIC OUTCOMES (PSO's)

After the successful completion of BCA program, the students are expected to

PSO 1: Embark upon an academic trajectory aimed at acquiring expertise in the fields of Computer Science and Applications.

PSO 2: Possess the capacity to comprehend, scrutinize, and develop computer programs within the domains pertaining to algorithmic processes, system software, web designing, and networking.

PSO 3: Utilize established software engineering methodologies and techniques within the realm of open source programming environments to effectively execute software projects.

PSO 4: Acquire knowledge pertaining to diverse matters, encompassing the latest trends in Information Technology.

PSO 5: Possess knowledge and skills to collaborate and communicate with peers for performance enhancement in workplace.

Expected Graduate Attributes:

After the successful completion of BCA program, the students shall posses the following graduate attributes

- Proficiency in technical skills like Computer Programming, Scripting and Designing.
- Develop Problem solving and critical thinking abilities.
- Excellent communication skills via sign language and written Communication.
- Build keen interest in innovation and development of new technological advances.
- Exhibit skills in working with team
- Display professional ethics and social values.
- Parade a thirst for knowledge through lifelong learning.

Bharathidasan University
Centre for Differently Abled Persons
Regulations for the **BCA Programme**
For the candidates admitted from the academic year 2023-2024 onwards
CHOICE BASED CREDIT SYSTEM (CBCS)

1. Eligibility

This programme is specifically for Persons with Speech and Hearing Impairment with minimum 40% of the specified disability **(Disability certificate and UDID is mandatory).** The candidates shall be required to have passed (10 + 2 patterns) with Computer Science in Higher Secondary Examination as specified by the Government of Tamil Nadu Higher Education (G1) Department G.O. (D) No.147, Dated 05.05.2023. The eligibility criteria are subject to change as per University Norms.

2. Duration of the programme

The programme is for a period of three years and bridge course for 1 month. Each academic year shall comprise of two semester viz. Odd and Even semesters. There shall be not less than 90 working days which shall comprise 450 teaching clock hours for each semester (Exclusive of the days for the conduct of University end-semester examinations).

i) The BCA programme is for a period of three years. It has single entry and multiple exit points. Thus, the Students can opt to leave (if passed the examinations) in the following stages with appropriate Certificate/ Diploma/ Advanced Diploma / BCA Degree as indicated in Table 1:

Total Credits for Award	Normal Duration	Award
146	Six semesters	BCA (Bachelor of Computer Applications)
98	Four Semesters	Advanced Diploma in Computer Applications
48	Two Semesters	Diploma in Computer Applications
23	One Semester	Certificate in Computer Applications

i. **For the Degree (BCA):** The candidates shall have subsequently undergone the prescribed course of study for a period of not less than three academic years, passed the examinations prescribed and fulfilled such conditions as have been prescribed therefore.

ii. **For the Advanced Diploma:** The candidates shall have subsequently undergone the prescribed course of study for a period of not less than two academic years, passed the examinations prescribed and fulfilled such conditions as have been prescribed therefore.

iii. **For the Diploma:** The candidates shall have subsequently undergone the prescribed course of study for a period of not less than one academic year, passed the examinations prescribed and fulfilled such conditions as have been prescribed therefore.

iv. **For the Certificate:** The candidates shall have subsequently undergone the prescribed course of study for a period of not less than six months, passed the examinations prescribed and fulfilled such conditions as have been prescribed therefore

3. Medium

The medium of instruction shall be in Bilingual (Both Tamil & English).

4. Number of Intake

The maximum number of student's enrolment for the Programme will be 15. It may be increased based on the applications received and approval from the university.

5. For the Degree

The candidates shall have subsequently undergone the prescribed course of study in a Centre for Differently Abled Persons to this University for a period of not less than three academic years (six semesters), passed the examinations prescribed and fulfilled such conditions as have been prescribed thereof.

6. The CBCS System

The course shall be conducted through Choice Based Credit System (CBCS). It is an instructional package developed to suit the needs of students to keep pace with the developments in higher education and the quality assurance expected of it in the light of liberalization and globalization in higher education.

7. Courses in Programme

a) Language Course (LC):

1. Tamil
2. English

b) Course structure

Core course	14
Elective Course	8
Non Major Elective	2
Skill Enhancement Course	8

c) Mathematics

Mathematics as a subject is given in Semester I and II for the students to become eligible for higher studies. (As per the present AICTE norms the eligibility criteria for admission to MCA course is – "Graduation with Mathematics at 10+2 or at Graduation level").

8. Semesters

An academic year is divided into two Semesters. In each Semester, Courses are offered in 15 teaching weeks with 30 hours per week and the remaining weeks are to be utilized for conduct of examinations and evaluation purposes.

9. Credits

A total of 146 credits are given for this BCA Programme. Credits earned through SWAYAM / MOODLE courses will also be added to the total credits. One core or elective courser may be completed via SWAYAM / MOODLE platform based on the student's preference.

10. Course

Each Course is designed with lectures/tutorials/laboratory or Industrial visit/ field work/ seminar / practical training/Assignments/Term paper or Report writing etc., to meet effective teaching and learning requirements.

11. Examinations

There shall be examinations at the end of each semester, for odd semesters in October/November; for even semesters in April/May. A candidate who does not pass the examination in any course(s) shall be permitted to appear in such failed course(s) in the subsequent examinations to be held in October/November or April/May.

12. Condonation

Students must have 75% of attendance in each semester to appear for the examination. Students who have attendance between 65% and 74% shall apply for condonation in the prescribed form with the prescribed fee. Students who have attendance between 50 and 64 shall apply for condonation in prescribed form with the prescribed fee along with the Medical Certificate. Students who have attendance below 50 are not eligible to appear for the examination. They shall re-do the semester(s) after completion of the Programme.

13. Evaluation

The performance of a student in each Course is evaluated in terms of percentage of marks with a provision for conversion to grade points. Evaluation for each Course shall be done by a Continuous Internal Assessment (CIA) by the Course teacher concerned as well as by an end semester examination and will be consolidated at the end of the semester. The components for continuous internal assessment are:

Best 2 tests out of 3	10 Marks (Retest for genuine absentees)
Group Activity	3 Marks
Attendance	2 Marks
Discipline	5 Marks
Assignments	5 Marks
Total	**25 Marks**

Attendance shall not be taken as a component for continuous assessment, although the students should secure a minimum of 75% attendance in each semester. In addition to continuous evaluation component, the end semester examination, which will be a written-type examination of at least 3 hours duration, would also form an integral component of the evaluation. The ratio of marks allotted to continuous internal assessment and to end semester theory examination is 25:75. The evaluation of laboratory component, wherever applicable, will also be based on continuous internal assessment and on an end-semester practical examination with 25:75 ratios.

14. Passing Minimum

Continuous Internal Assessment (CIA)		***University Examination (UE)***
Theory	40% out of 25 marks	40% out of 75 marks
Practical	40% out of 40 marks	40% out of 60 marks

Failed candidates in the Internal Assessment are permitted to appear for their Internal Assessment in the subsequent semesters (2 chances will be given) by writing Tests and Assignments.

15. Conferment of the Bachelor's Degree

A candidate shall be eligible for the conferment of the Degree of Bachelor of Computer Applications only if he/she has earned the minimum marks and credits for the programme prescribed thereof.

16. Revision of Regulations and Curriculum

The University may from time to time revise, amend and change the Regulations and the Curriculum, if found necessary.

17. Classification of Final Results

Grading & Classification for the award of the Degree shall be as existing for the other UG. Degree Courses of Bharathidasan University

Note: The above regulations are subject to amendments from time to time.

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI

Centre for Differently Abled Persons

Bachelor of Computer Applications

முதல் பருவம் - தாள் - 1

தமிழ் இலக்கிய வரலாறு -1

Course Code: 23UCACL01 **Max. Marks : 100**

Credits : 3 **Internal Marks : 25**

External Marks : 75

பாட நோக்கம்

- முதலாமாண்டுப் பட்ட வகுப்பு மாணவர்களுக்குத் தமிழ் மொழி இலக்கியங்களை அறிமுகம் செய்தல்
- தமிழ் இலக்கியப் போக்குகளையும், இலக்கணங்களையும் மாணவர் அறியுமாறு செய்தல்
- தமிழ் இலக்கியம் சார்ந்த போட்டித் தேர்வுகளுக்கு ஏற்ப கற்பித்தல் நடைமுறைகளை மேற்கொள்ளுதல்

அலகு 1 சங்க இலக்கியம்

நற்றினை - முதல் பாடல் - நின்று சொல்லர்

குறுந்தொகை - மூன்றாம் பாடல் - நிலத்தினும் பெரிதே[1]

ஐங்குறுநூறு - நெல் பல பொலிக - பொன் பெரிது சிறக்க - முதல் பாடல் வேட்கைப் பத்து

கலித்தொகை 51 சுடர்தொடி இக்கேளாய் - குறிஞ்சிக்கலி

புறநானூறு 189 தெண்கடல் வளாகம் பொதுமையின்றி நாடா கொன்றோ - 187

அலகு 2 அற இலக்கியம்

திருக்குறள் - அறன் வலியுறுத்தல் அதிகாரம்

நான்மணிக்கடிகை - நிலத்துக்கு அணி யென்ப

பழமொழி நானூறு - தம் நடை நோக்கார்

இனியவை நாற்பது – 37- இளமையை மூப்பு என்று

அலகு 3 காப்பிய இலக்கியம்

சிலப்பதிகாரம் - வழக்குரைகாதை[6]

மணிமேகலை - பாத்திரம் பெற்ற காதை

பெரியபுராணம் - பூசாலர் நாயனார் புராணம்

கம்பராமாயணம் – குகப் படலம்

சீறாப்புராணம் - மானுக்குப் பிணை நின்ற படலம்

இயேசு காவியம் - ஊதாரிப்பிள்ளை

அலகு - 4

இலக்கணம்: பொருத்துதல் - புகழ்பெற்ற நூலாசிரியர் - தொடரும் தொடர்பும் அறிதல் : இத்தொடரால் குறிக்கப்பெறும் சான்றோர் : அடைமொழியால் குறிக்கப்பெறும் நூல். பிரித்தெழுக: எதிர்ச்சொல்லை எடுத்தெழுதுதல் - பிழை திருத்தம் - சந்திப் பிழையை நீக்குதல் - மரபுப் பிழைகள், வழுவுச் சொற்களை நீக்குதல் - பிறமொழிச் சொற்களை நீக்குதல் . ஆங்கிலச் சொல்லுக்கு நேரான தமிழ்ச் சொல்லை அறிதல். – ஒலி வேறுபாடறிந்து சரியான பொருளையறிதல். – ஒரெழுத்து ஒருமொழி உரிய பொருளைக் கண்டறிதல[6,7].

அலகு - 5

மொழித்திறன் போட்டி தேர்வு

1. பொருள் பொதிந்த சொற்றொடர் அமைத்தல்
2. ஓர் எழுத்து ஒரு மொழி

3. வேற்றுமை உருபுகள்
4. திணை பால் எண் இடம்
5. சொல்லாக்கம் மொழிபெயர்ப்பு.

Pedagogical method used:

[1]Blended Learning
[6]Flipped Learning
[7]Inquisitive Learning

References:

- மு. வரதராசன், தமிழ் இலக்கிய வரலாறு, சாகித்திய அகாடமி, புதுடெல்லி மது. சா. விமலா விமலானந்தன், தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை
- தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம்,மதுரை
- தமிழ் இலக்கிய வரலாறு – முனைவர். சிற்பி பாலசுப்பிரமணியம், முனைவர் சேதுபதி
- புதிய தமிழ் இலக்கிய வரலாறு - முனைவர் சிற்பி பாலசுப்பிரமணியம், நீல. பத்மநாதன்
- தமிழ் இலக்கிய வரலாறு- டாக்டர். அ. கா. பெருமாள்
- தமிழ் இலக்கிய வரலாறு - முனைவர் பா. ச. ஏசுதாசன்
- தமிழ் இலக்கிய வரலாறு - ஸ்ரீ குமார்
- வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு - பாக்கிய மேரி
- தமிழ் பயிற்று முறை, பேராசிரியர் ந. சுப்புரெட்டியார் - மணிவாசகர் பதிப்பகம், சிதம்பரம்

மாணவர் பெறும் திறன்

இப்பாடத்தைக் கற்பதால் பின்வரும் பயன்களை மாணவர் அடைவர்

CO1	K1	சங்க இலக்கியத்தில் காணப்பெறும் வாழ்வியல் சிந்தனைகளை அறிந்து கொள்வர்
CO2	K2 K3	அற இலக்கியம் மற்றும் தமிழ் காப்பியங்களின்வழி வாழ்வியல் சிந்தனையைப் பெறுவர்
CO3	K1 K3	மொழியறிவோடு சிந்தனைத்திறனைப் பெறுவர்
CO4	K2 K4	மொழிபெயர்ச்சிக்குத் தேவையான இலக்கணங்களைக் கற்பர்
CO5	K5	மொழித்திறன் போட்டி தேர்வுக்கான திறனை பெறுவர்

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓					✓				
CO2	✓	✓				✓	✓		✓	
CO3		✓	✓				✓	✓	✓	
CO4			✓				✓	✓	✓	
CO5				✓	✓			✓		✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-I Core Course - I
GENERAL ENGLISH AND INDIAN SIGN LANGUAGE-I

Course Code	: **23UCAGE01**	**Max. Marks**	: 100
Credits	: 3	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To teach the students the basic building blocks of English
- To make them to acquire signs for a basic functional vocabulary of 250+ words.
- To make them to learn 100-150 conversational sentences including statements, questions and instructions.
- To teach them the Basic communicative competence in Indian sign language.

Unit: 1 - BASIC ENGLISH and ISL
Indian Sign Language: Alphabets, Vocabulary, Sentences, Greetings. Written form- Alphabets, Vowels, Consonants, words, sight words, Basic Vocabulary, Word Formation, Simple sentence formation[1]

Unit II - SELF-AWARENESS (WHO) & POSITIVE THINKING (UNICEF)
Life Story: Chapter 1 from MalalaYousafzai, I am Malala, An Autobiography or The Story of My Experiments with Truth (Chapters 1, 2 & 3).

M.K.Gandhi; Poem Where the Mind is Without Fear – Gitanjali 35, Rabindranath Tagore Night of the scorpion by Nissim Ezekiel

Unit III - EMPATHY, CRITICAL & CREATIVE THINKING
Poem: Nine Gold Medals – David Roth; Alice Fell or poverty – William Wordsworth; Stopping by the Woods on a Snowy Evening – Robert Frost. Short Story: No Looking Back - Shivani Gupta; One little Finger- Malinin Chib; The Magic Brocade – A Tale of China

Unit IV
Part of Speech: Articles, Noun, Pronoun, Verb, Adverb, Adjective, Preposition [5,6].

Unit V
Paragraph and Essay Writing[7]: Descriptive, Expository, Persuasive, Narrative, Reading Comprehension

UNIT VI:
Need and importance of English language in our day-to-day life and in the contemporary World Basic etiquettes for typing a message in phone – requesting a teacher or administrator for help – Asking for permission- requesting for leave –Inviting for a meeting- Initiating a group discussion[6].

Pedagogical method used:

[1]Blended Learning
[5]Exploratory Learning
[6]Flipped Learning
[7]Inquisitive Learning

Materials for Study & Reference:

Text Books:

1. MalalaYousafzai. I am Malala, Little, Brown and Company, 2013
2. M.K. Gandhi. An Autobiography or The Story of My Experiments with Truth (Chapter – I), Rupa Publications, 2011.
3. Rabindranath Tagore. "Gitanjali 35" from Gitanjali (Song Offerings): A Collection of Prose Translations Made by the Author from the Original Bengali. MacMillan, 1913.
4. N.Krishnasamy. Modern English: A Book of Grammar, Usage and Composition Macmillan, 1975.
5. J C Nesfield. Manual of English Grammar and Composition. https://archive.org/details/in.ernet.dli.2015.44179
6. Malini Chib,One little finger:SAGE 2011: Autobiography of Malini Chib-a woman who defied all odds to emerge victorious in spite of a crippling disability and an indifferent society

Web Resources:

1. MalalaYousafzai. I am Malala (Chapter 1) https://archive.org/details/i-am-malala
2. M.K Gandhi. An Autobiography or The Story of My Experiments with Truth(Chapter-1)-Rupa Publication, 2011 https://www.indiastudychannel.com/resources/146521- Book-Review-An-Autobiography-or-The-story-of-my-experiments-with-Truth.aspx
3. Rabindranath Tagore. "Gitanjali 35" from Gitanjali (Song Offerings) https://www.poetryfoundation.org/poems/45668/gitanjali-35
4. https://books.google.co.in/books/about/One_Little_Finger.html?id=ruKRAQAACAAJ&redir_esc=y

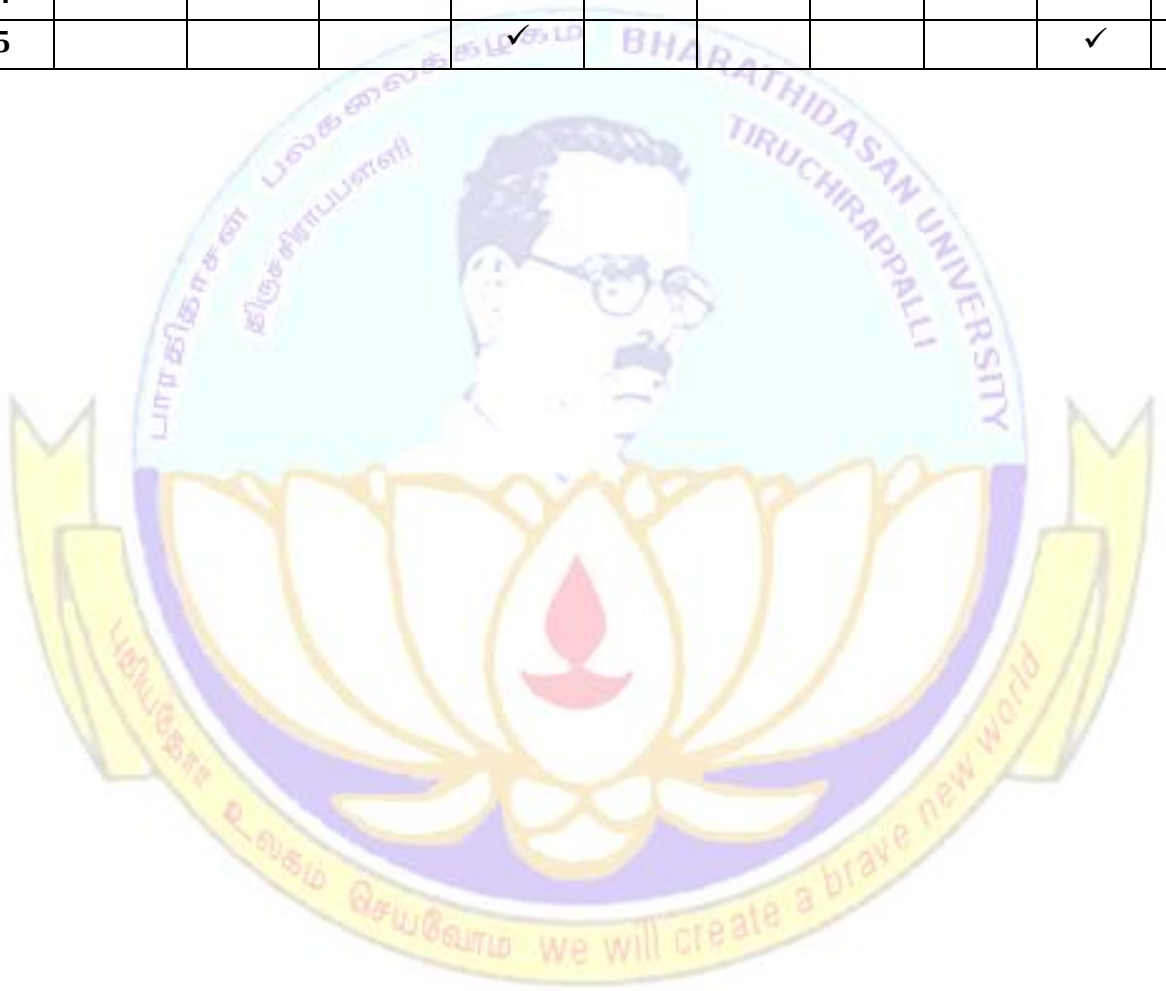
Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1 K2**	Acquire self-awareness and positive thinking required in various life situations
CO2	**K2 K3**	Acquire the attribute of empathy
CO3	**K3 K4**	Acquire creative and critical thinking abilities
CO4	**K2 K3**	Learn basic grammar
CO5	**K4 K5**	Development and integrate the use of four language skills i.e., listening, speaking, reading and writing.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓					✓				
CO2	✓	✓			✓	✓	✓		✓	
CO3		✓	✓				✓		✓	
CO4			✓	✓	✓		✓	✓		
CO5				✓					✓	✓



BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-I Core Course - I
PROGRAMMING IN C

Course Code	: **23UCACC01**	**Max. Marks**	: 100
Credits	: 5	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To learn the syntax of all the statements and to provide programming skills in C.
- To equip the knowledge on Decision Making and Branching Statements.
- To learn Array, pointer and file Management.

Unit 1:
Fundamental Character set - Identifier and keywords - Data Types - Constants - Variables - Declarations - Expressions - Statements - Operators - Library functions[10].

Unit-2:
Data input output functions - Simple C programs - Decision making, branching and looping. Break, continue and goto statements[4].

Unit 3:
Arrays: Declaring and Initializing, One Dimensional Arrays, Two Dimensional Arrays, Multi Dimensional Arrays - Passing arrays to functions. Functions: Function Definition, prototyping, types of functions, passing arguments to functions, Nested Functions, Recursive functions[3] - Storage Classes.

Unit-4:
Strings: Declaring and Initializing strings, Operations on strings, Arrays of strings, passing strings to functions. Structures - Declaring and Initializing, Nested structure, Array of Structure, Passing Structures to functions, Union[1].

Unit-5:
Pointers: Declaration - Passing pointers to Functions - Operation in Pointers - Pointer and Arrays - Arrays of Pointers - Structures and Pointers. Files - File modes, File functions, and File operations, Text and Binary files, Graphics in C[10].

Unit-6:
The importance of C Programming in getting employment opportunities: discussions

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[4]E-mind Map
[10]Participative Learning

Recommended Texts:

1. E. Balaguruswamy, 2007, Programming in ANSI C, TMH Publishing Company Ltd.

Reference Books:

1. Herbert Schildt, **"**C: The complete Reference", 4th Edition, McGraw Hill, 2003.
2. B.L.Juneja, "Programming in C", 1st Edition, Cengage Learning, 2012.

E-Books:

- http://www.freebookcentre.net/Language/Free-C-Programming-Books-Download-1.htm
- https://electronicsforu.com/resources/15-free-c-programming-ebooks

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1 K2 K3**	Understand the concepts of C programming language
CO2	**K1 K2 K3**	Describe the reason why different constructs are available for iteration, such as "for" loops, "do...while" loops
CO3	**K1 K2 K3 K4**	Providing by the user of a program or environment, in a context where the usual assumption is that functions are built in to the program or environment.
CO4	**K1 K2 K3 K4**	Apply the concepts of Arrays, Strings and Functions in C.
CO5	**K1 K2 K3 K4**	Explore the concepts of pointers, structures, unions and files in C

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓				✓				
CO2		✓	✓			✓	✓		✓	
CO3	✓	✓					✓	✓	✓	
CO4			✓		✓		✓	✓	✓	
CO5				✓	✓			✓	✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-I Core Practical - I
PROGRAMMING IN C LAB

Course Code : **23UCALC01**
Credits : 5
Max. Marks : 100
Internal Marks : 40
External Marks : 60

Objectives:

- To Impart Practical Training in C Programming Language
- To perform Procedures as per Laboratory Standards in the area of application of C Programming.
- To provide skill training in writing various C programs.

Exercises: [1,3,5,7]

1. Write a Program to find whether given number is Even or Odd.
2. Write a Program to find greatest of three numbers.
3. Write a Program to using switch statement to display Monday to Sunday.
4. Write a Program to display first Ten Natural Numbers and their sum.
5. Write a Program to find Multiplication of Two Matrices.
6. Write a Program to using Fibonacci using Recursion
7. Write a Program to reverse a string using Strings.
8. Write a Program to solve Factorial using functions.
9. Write a simple C program to find the sum of an integer array using pointers
10. Write a C program to copy the contents of one file into another

Pedagogical method used:
[1]Blended Learning
[3]Constructivist Learning
[5]Exploratory Learning
[7]Inquisitive Learning

E-Books:
http://www.skiet.org/downloads/cprogrammingquestion.pdf
https://bookboon.com/en/c-cpp-csharp-ebooks

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

CO1	**K1**	Identify the logic for a given problem
CO2	**K1 K2**	Recognize the syntax and construction of C Programming code
CO3	**K1 K2 K3**	Apply the steps involved in compiling, linking & debugging C code
CO4	**K1 K2**	Analyze the concepts of iteration or looping, branching, array etc.
CO5	**K1 K4 K5**	Create C programs using all the concepts that have been covered in the theory course

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓				
CO2		✓		✓		✓	✓		✓	
CO3		✓	✓				✓	✓	✓	
CO4			✓	✓			✓	✓	✓	
CO5				✓	✓			✓	✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-I: Elective Course - I
DISCRETE MATHEMATICS

Course Code	: **23UCAEC01A**	**Max. Marks**	: 100
Credits	: 4	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To know the applications of Matrices, Determinants and set theory.
- To enable the students to understand computer representations of Matrices.
- To enable the students to understand Mathematical Logic

UNIT I:
Matrices – Types of Matrices[1] – Operation on Matrices – Transpose of Matrices – Multiplication of Matrices

Unit II
Determinants of Order One, Two and Three – Properties of Determinants[2] - Cramer's Rule (Simple Problems only)

Unit III
Set theory: Introduction - Sets- Notations - descriptions of sets - Subsets - Venn diagram - Euler diagrams - Operations on Sets - Properties of set Operations - Verification of the basic laws by Venn diagrams - Principles of duality[1,5].

UNIT IV
Relations: Cartesian product of two sets - Relations - Representation of a relation – Operations on relations - Equivalence relations[4] - Functions: Functions and operators - one-to-one - onto functions.

UNIT V
Mathematical Logic: Logical statement of Proposition – Types of Propositions – The Propositional Calculus – The Negation of a Proposition – Disjunction – Conjunction – Tautologies and Contradictions – Logical Equivalence – The Algebra of Propositions – Conditional Propositions[11]

UNIT VI
The relationship of set theory and matrices in day-to-day applications in human life[11]

Pedagogical method used:
[1]Blended Learning
[2]Brain Storming
[4]E-mind Map
[5]Exploratory Learning
[11]Reflective Learning

Text Books:

1. Discrete Mathematics, Dr. N. Sridharan, N. Chandrasekaran, The National Publishing Company 2000.(For Unit- I(Pages1.1 – 1.24) &Unit- II (Pages 2.1 -2.28, Pages 3.1 – 3.10)
2. Discrete mathematics, Vatssa, B.S., Wishwar Prakashan , A Division of Wiley Eastern Ltd., 3rd Edition (1988), New Delhi - 110 002. (For Unit-3(Section 1.1 – 1.18))
3. Graphs theory with application to Engineering and Computer Science, Narsingh Deo, Prentice Hall of India, New Delhi (1993). (For Unit- 4 (Pages 1 -9, Pages 14 – 17, Pages 19-34) and Unit-5 (Pages(39 – 52 & 55- 75).

Reference Books:

1. Modern Algebra, Arumugan and A.T.Issac, New Gamma Publication (1992), New Gamma Publication (1992).
2. Discrete Mathematics, M.K.Venkataraman, The National Publishing Company, 2004

E-Books:

- https://www.ebooksdirectory.com/mathematics.php?gclid=Cj0KCQjwlv_XBRDrARIsAH-iRJRmoqA6DS73tU2Jkp9MiuTFRpZmTuPGcWQ04uJedMxpr7Ej8O-HSpgaApaOEALw_wcB
- https://www.win.tue.nl/~hzantema/ds.pdf

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1**	Identify the basic principles of Set Theory
CO2	**K1 K2**	Understand Matrices
CO3	**K2 K3**	Identify the basic principles of logics
CO4	**K2 K4**	Understand the basic knowledge of Relations

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓					✓	✓			
CO2	✓	✓				✓	✓	✓		
CO3			✓	✓					✓	
CO4			✓		✓		✓			✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-I Skill Enhancement Course - I
FUNDAMENTALS OF INFORMATION TECHNOLOGY LAB

Course Code	: **23UCASEC01**	**Max. Marks**	: 100
Credits	: 2	**Internal Marks**	: 40
		External Marks	: 60

Objectives:

- To enrich the students with the practical knowledge in MS Word
- To make them to get the practical knowledge in MS PowerPoint
- To make the students to acquire the practical knowledge of working in MS Excel
- To enrich them with the practical knowledge of working in MS Powerpoint

Exexsises[**3**, 5, 7]

WORD PROCESSING

1. Prepare a Student Resume in MS Word.
2. Prepare a leave letter in MS Word.
3. Create a News Paper format document in MS Word.
4. Prepare a calendar in MS Word.
5. Business Letter using Mail Merge Concept.

SPREAD SHEET

1. Basic operations in MS-Excel
2. Entering data
3. Editing data
4. Formatting data
5. Prepare a Mark List for n students.

MS-POWER POINT

1. Changing slide layout
2. Working with fonts and bullets
3. Inserting Clipart
4. Applying Transition and animation effects

Pedagogical method used:

[3]Constructivist Learning
[5]Exploratory Learning
[7]Inquisitive Learning

Materials for Study & Reference:

E-Books:

http://www.msuniv.ac.in/CITE/21.Computer%20Fundamentals%20and%20Office%20Automation-Lab%20Exercise%20sand%20Solutions.pdf
https://prabuforeducation.wordpress.com/open-office/lab-record/

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

CO1	**K1**	To perform documentation
CO2	**K1**	To use drawing and graphics tool
CO3	**K2**	To perform mathematical operations
CO4	**K2**	To create charts and change its characteristics
CO5	**K3**	To know more about the powerpoint presentation skills

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1		✓	✓			✓	✓			
CO2	✓	✓						✓		
CO3			✓	✓		✓	✓			
CO4			✓		✓		✓	✓	✓	
CO5				✓		✓	✓		✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester - I
VALUE EDUCATION

Course Code : 23UCAVE **Max.Marks :100**
Credits : 2 **Internal Marks : 25**
External Marks : 75

Course Objectives:

- Understand the concept of peace and value education.
- Understand the dynamics of transformation of violence into peace.
- Realise the significance of Values in Self-development.
- Familiarise the nature of conflicts and their resolutions.
- Global culture of peace and values.
- Adopt peace and value education in the curriculum.

Unit I - Philosophy of Life and Social Values[2]

Human Life on Earth (Kural 629) Purpose of Life (Kural 46) Meaning and Philosophy of Life (Kural 131, 226) Family (Kural 45), Peace in Family(Kural 1025) Society (Kural 446), The Law of Life (Kural 952), Brotherhood (Kural 807) Five responsibilities / duties of Man (a) to himself (b) to his family (c) to his environment (d) to hissociety, (e) to the Universe in his lives (Kural 43, 981).

Unit II - Human Rights and Organisations[5]

Definitions, Nature of Human Rights. Universal Declaration of Human Rights, International covenent on Civil and Political Rights - International covenent of Economic, Social and Cultural Rights. Amnesty International Red Cross.

Unit III - Human Rights : Contemporary Challenges[8,10]

Child labour - Womens Right - Bonded labour - Problems of refugees – Capital punishment. National and State Human Rights Commissions

Unit IV - Yoga and Health[11]

Definition, Meaning, Scope of Yoga - Aims and objectives of Yoga – Yoga Education with modern context - Different traditions and schools of Yoga - Yoga practices: Asanas, Pranayama and Meditation.

Unit V - Role of State Public Service Commission[12]

Constitutional provisions and formation - Powers and Functions - Methods of recruitment - Rules and notification, syllabi for different exams- written and oral - placement

Pedagogical method used:

[2]Brain Storming
[5]Exploratory Learning
[8]JIGSAW
[10]Participative Learning
[11]Reflective Learning
[12]Scenario Analysis Based Learning

Materials for Study & Reference:

Reference Books:

1. Thirukkural with English Translation of Rev. Dr. G.U. Pope, Uma Publication, 156, Serfoji Nagar, Medical College Road, Thanjavur 613 004
2. Leah Levin, Human Rights, NBT, 1998
3. V.R. Krishna Iyer, Dialetics and Dynamics of Human Rights in India, Tagore Law Lectures.
4. Yogic Thearpy - Swami Kuvalayananda and Dr.S.L.Vinekar, Government of India, Ministry of Health, New Delhi.
5. SOUND HEALTH THROUGH YOGA - Dr.K.Chandrasekaran, Prem Kalyan Publications, Sedaptti, 1999.

E-Books:

- https://www.researchgate.net/publication/293755836_VALUE_EDUCATION_NEED_OF_THE_HOUR
- https://www.ugc.ac.in/oldpdf/xplanpdf/humanrights.pdf

Course Outcomes:

On completion of the course the students will be able to:

CO1	K1	Develop as an all round and well-balanced personality
CO2	K1	Know our nations democratic policies and principles
CO3	K2	Understand social responsibility and Culture
CO4	K2	Contribute for creating Intellectually competitive nation
CO5	K3	Understand Human Rights and the value of constitutional protection

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓					✓	✓			
CO2	✓	✓					✓	✓		
CO3		✓	✓			✓	✓			
CO4				✓	✓			✓		
CO5				✓		✓	✓		✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
இரண்டாம் பருவம் - தாள் - 2
தமிழ் இலக்கிய வரலாறு -2

Course Code	: **23UCACL02**	**Max. Marks**	: 100
Credits	: 3	**Internal Marks**	: 25
		External Marks	: 75

பாட நோக்கம்:

- முதலாமாண்டுப் பட்ட வகுப்பு மாணவர்களுக்குத் தமிழ் மொழி இலக்கியங்களை அறிமுகம் செய்தல்
- தமிழ் இலக்கியப் போக்குகளையும், இலக்கணங்களையும் மாணவர் அறியுமாறு செய்தல்
- தமிழ் இலக்கியம் சார்ந்த போட்டித் தேர்வுகளுக்கு ஏற்ப கற்பித்தல் நடைமுறைகளை மேற்கொள்ளுதல்

அலகு 1 தமிழ் இலக்கிய வரலாறு அறிமுகம்

சிற்றிலக்கியம்: குறவஞ்சி, கலம்பகம், உலா ,பரணி, பல்லு, பிள்ளைத்தமிழ் தூது அந்தாதி

தனிப்பாடல் அறிமுகம் [1]

இக்கால இலக்கியம்: கவிதை, சிறுகதை, நாடகம், உரைநடை, திராவிட, இயக்கம் வளர்த்த தமிழ்.

அலகு 2 சிற்றிலக்கியமும், தனிப்பாடலும்

சிற்றிலக்கியம்:

- கலிங்கத்துப்பரணி - விருந்தினரும் வறியவரு நெருங்கி யுண்ணரும் முதல் கேட்பாரைக் காண்மின் காண்மின் - வரை
- திருக்குற்றாலக் குறவஞ்சி - வானரங்கள் கனிகொடுத்து[6]
- முக்கூடற் பள்ளு - ஆற்று வெள்ளம் நாளை வரத்
- அபிராமி அந்தாதி - கலையாத கல்வியும் குறையாத வயதும்
- திருவரங்கக் கலம்பகம் - மறம் பிள்ளைப் பெருமாள் ஐயங்கார் பேசவந்த தூத செல்லரித்த ஓலை செல்லுமோ
- தமிழ்விடு தூது முதல் 10 கன்னிகள்

அலகு 3 இக்கால இலக்கியம்

- பாரதியார் பாரத சமுதாயம் வாழ்கவே
- பாரதிதாசன் - சிறுத்தையே வெளியில் வா[1]
- நாமக்கல் கவிஞர் - கத்தியின்றி
- தமிழ் ஒளி - மீன்கள் (அந்திநிலா பார்க்க வா)
- ஈரோடு தமிழன்பன் - எட்டாவது சீர்

சிறுகதைகள்

- புதுமைப்பித்தன் - கடிதம்[6]
- ஜெயகாந்தன் - வாய் சொற்கள் (மாலை மயக்கம் தொகுப்பு)
- ஆர். சூடாமணி - அந்நியர்கள்

அலகு 4 இக்கால இலக்கியம் – 2

- தந்தை பெரியார் - திருக்குறள் (மாநாட்டு) உரை[10]
- பேரறிஞர் அண்ணா - இரண்டாம் உலகத் தமிழ் மாநாட்டு உரை
- கலைஞர் மு. கருணாநிதி - தொல்காப்பிய பூங்கா - எழுத்து முதல் நூற்பா கட்டுரை

நாடகம் திரைத்தமிழ்

- வேலைக்காரி - திரைப்படம்

- ராஜா ராணி - சாக்ரடீஸ் ஓரங்க நாடகம்
- இதழியல் தமிழ் : முரசொலி கடிதம்
- செம்மொழி வரலாற்றில் சில செப்பேடுகள்

அலகு – 5
மொழித்திறன் போட்டி தேர்வு திறன்

1. தொடர் வகைகள்
2. மரபுத்தொடர் பழமொழிகள்
3. பிற மொழிச் சொற்களை களைதல்
4. வழுச்சொற்களை நீக்குதல்[11]
5. இலக்கண குறிப்பு அறிதல்.

Pedagogical method used:

[1]Blended Learning
[6]Flipped Learning
[10]Participative Learning
[11]Reflective Learning

பார்வை நூல்கள்

- மு. வரதராசன், தமிழ் இலக்கிய வரலாறு, சாகித்திய அகாடமி, புதுடெல்லி மது. சா. விமலா விமலானந்தன், தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை
- தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை
- தமிழ் இலக்கிய வரலாறு – முனைவர். சிற்பி பாலசுப்பிரமணியம், முனைவர் சேதுபதி
- புதிய தமிழ் இலக்கிய வரலாறு - முனைவர் சிற்பி பாலசுப்பிரமணியம், நீல. த்மநாதன்
- தமிழ் இலக்கிய வரலாறு- டாக்டர். அ. கா. பெருமாள்
- தமிழ் இலக்கிய வரலாறு - முனைவர் பா. ச. ஏசுதாசன்
- தமிழ் இலக்கிய வரலாறு - ஸ்ரீ குமார்
- வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு - பாக்கிய மேரி
- தமிழ் பயிற்று முறை, பேராசிரியர் ந. சுப்புரெட்டியார் - மணிவாசகர் பதிப்பகம், சிதம்பரம்

மாணவர் பெறும் திறன்

இப்பாடத்தைக் கற்பதால் பின்வரும் பயன்களை மாணவர் அடைவர்

CO1	**K1**	புதுக்கவிதை வரலாற்றினை அறிந்து கொள்வர்.
CO2	**K2** **K3**	திராவிட இயக்க இலக்கியங்களைக் கற்பதன் மூலம் மொழி உணர்வு, இன உணர்வு, சமத்துவம் சார்ந்த சிந்தனைகளைப் பெறுவர்
CO3	**K1** **K3**	தமிழ்மொழியைப் பிழையின்றி எழுதவும், புதிய கலைச் சொற்களை உருவாக்கவும் அறிந்து கொள்வர்
CO4	**K3** **K4**	போட்டித் தேர்வுகளில் வெற்றி பெறுவதற்குத் தமிழ்ப் பாடத்தினைப் பயன் கொள்ளும் வகையில் பயிற்சி பெறுவர்.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓				
CO2		✓	✓			✓	✓		✓	
CO3			✓		✓		✓	✓	✓	
CO4				✓	✓		✓	✓		✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-II: English Language Course-II
GENERAL ENGLISH -II

Course Code : **23UCAGE02** **Max. Marks** : 100
Credits : 3 **Internal Marks** : 25
External Marks **:** 75

Course Objectives:

- To make students realize the importance of resilience
- To enable them to become good decision makers
- To enable them to imbibe problem-solving skills
- To enable them to use tenses appropriately
- To help them use English effectively at the work place**.**

Unit I - RESILIENCE
Poem: Don't Quit – Edgar A. Guest, Still Here – Langston Hughes,
Short Story: Engine Trouble – R.K. Narayan, Rip Van Winkle – Washington Irving [1,6].

Unit II - DECISION MAKING
Short Story: The Scribe – Kristin Hunter, The Lady or the Tiger - Frank Stockton
Poem : The Road not Taken – Robert Frost, Snake – D. H Lawrence.

Unit III - PROBLEM SOLVING
Prose life Story: How I taught My Grandmother to Read – Sudha Murthy,
Autobiography: How frog Went to Heaven – A Tale of Angolo, Wings of Fire (Chapters 1,2,3) by A.P.J Abdul Kalam.

Unit IV:
Tenses: Present, Past, Future, Concord [10]

Unit V
English in the Workplace: E-mail – Invitation, Enquiry, Seeking Clarification, Circular, Memo, Minutes of the Meeting.

UNIT VI:
Class discussions: Importance of modern English grammar in writing and speech at the current affairs[11].

Pedagogical method used:
[1]Blended Learning
[6]Flipped Learning
[10]Participative Learning
[11]Reflective Learning

Materials for Study & Reference:
Text Books:

1. Martin Hewings. Advanced English Grammar. Cambridge University Press, 2000
2. SP Bakshi, Richa Sharma. Descriptive English. Arihant Publications (India) Ltd., 2019.
3. Phil Chambers. Brilliant Speed Reading: Whatever you need to read, however. Pearson, 2013.
4. Communication Skills : Practical Approach Ed.ShaikhMoula, Ramendra Kumar. Stories of Resilience, Blue Rose Publications, 2020

Web Resources:

1. Langston Hughes. Still Here https://poetryace.com/im-still-here
2. R. K. Narayan. Engine Trouble http://www.sbioaschooltrichy.org/work/Work/images/new/8e.pdf
3. Washington Irving. Rip Van Winkle https://www.gutenberg.org/files/75976/75976-h/75976-h.htm
4. Frank Stockton. The Lady or the Tiger https://www.gutenberg.org/ebooks/396

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

CO1	**K1 K2**	Realize the importance of resilience
CO2	**K3**	Become good decision-makers
CO3	**K4**	Imbibe problem-solving skills
CO4	**K2 K3**	Use tenses appropriately
CO5	**K4 K5**	Use English effectively at the work place.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓					✓				
CO2		✓				✓		✓	✓	
CO3		✓	✓						✓	
CO4	✓			✓			✓	✓		
CO5			✓		✓				✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-II: Core Course- II
PYTHON PROGRAMMING

Course Code	: **23UCACC02**	**Max. Marks**	:100
Credits	: 5	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To make students understand the concepts of Python programming.
- To apply the OOPs concept in Python programming.
- To impart knowledge on function and files concepts.
- To make the students learn best practices in Python programming.

UNIT I:

Overview of Programming & Introduction to Python: Structure of a Python Program[1], Elements of Python. Python Interpreter, Using Python as calculator, Python shell, Indentation, Atoms, Built-in DataTypes, Type conversions.

UNIT II:

Identifiers and keywords, Literals, Comments, Operators, Python membership & identity operators[7], Operator precedence, Python Arrays: Defining and Processing Arrays–Array methods

UNIT III:

Creating Python Programs: Input and Output Statements[4], String special operations, String formatting operator, Single quotes, Double quotes, Triple quotes, Control Statements**,** Mathematical functions and constants

UNIT IV:

Functions – Function Definition – Function Call – Variable Scope and its Lifetime-Return Statement. Function Arguments: Required Arguments, Keyword Arguments, Default Arguments, Recursion[3]. Files and Directories - Creating files Operations on files, File object attributes, file positions, Listing Files in a Directory

UNIT V:

Python tuples and sets, Python Dictionary - Classes, Object-oriented Programming and Exception: Abstract Data Types and Classes, Inheritance, Encapsulation and Information hiding, handling exceptions[7]

UNIT VI

The importance of python programming in getting employment opportunities in big data area: discussions

Pedagogical method used:

[1]Blended Learning
[5]Exploratory Learning
[6]Flipped Learning
[7]Inquisitive Learning

Materials for Study & Reference:

Text Books:

1. John V Guttag. "Introduction to Computation and Programming Using Python", Prentice Hall of India
2. Nischay Kumar, "Python Programming Fundamentals – A Beginner's Handbook, Educreation Publishing, 2018

Reference Books:

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. Allen Downey, Jeffrey Elkner, Chris Meyers ,How to think like a computer scientist :Learning with Python,Freelyavailableonline.2012

E-Books:

- http://www.e-booksdirectory.com/listing.php?category=265&gclid=cj0kcqjw0pt xbrcgarisaknyfg3v-lfpe6uqg7vdxio7po8v0t8re3atcryufq3f_j_td5dbtvqajlaaanzqealw_wcb
- https://medium.mybridge.co/19-free-ebooks-to-learn-programming-with-python-8f6f0ad4a7f8

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1 K2**	Demonstrate the concepts of control structures in Python
CO2	**K1 K3**	Understand arrays and array methods in Python
CO3	**K3 K4**	Provides complete information about input, output statements and strings
CO4	**K3 K4**	Implement the concept of functions and file handling.
CO5	**K5**	Create and manipulate lists, tuples and dictionaries

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓		✓		
CO2	✓		✓			✓	✓		✓	
CO3			✓	✓			✓	✓	✓	
CO4			✓	✓	✓		✓		✓	
CO5				✓	✓	✓		✓	✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-II: Core Practical - II
PYTHON PROGRAMMING LAB

Course Code	: **23UCALC02**	**Max. Marks**	: 100
Credits	: 5	**Internal Marks**	: 40
		External Marks	: 60

Course Objectives:

- Be able to design and program Python applications.
- Be able to create loops and decision statements in Python.
- Be able to work with functions and pass arguments.
- Be able to build Python modules for reusability.
- Be able to read and write files in Python.

LAB EXERCISES[1,3,5]:

1. Write a Program to calculate area of circle and square using input functions.
2. Write a Program to find biggest number among three numbers.
3. Write a Program to find leap or non leap year using nested if functions
4. Write a Program to using switch statement to display Monday to Sunday.
5. Write a Program to display the Fibonacci series upto N numbers.
6. Write a Program using string functions
7. Write a Program using class, method & object
8. Write a Program using Exception handling
9. Write a Program Using set
10. Write a Program Using List

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[5]Exploratory Learning

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

CO1	**K2**	Develop the simple program for input method in Python
CO2	**K2 K3**	Perform various programs to demonstrate the concepts of control structures
CO3	**K4**	Create simple Python programs using string functions
CO4	**K3 K4**	Implement Python programs using OOPs and apply the concept of exception handling
CO5	**K4 K5**	Implement methods to create and manipulate list and set in Python

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓		✓			✓		✓		
CO2		✓	✓			✓	✓	✓	✓	
CO3			✓	✓		✓	✓	✓		
CO4			✓	✓	✓	✓	✓		✓	
CO5				✓	✓	✓		✓		✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI

Centre for Differently Abled Persons

Bachelor of Computer Applications

Semester-II: Allied Course – II

STATISTICAL METHODS AND ITS APPLICATION

Course Code	: **23UCAEC02A**	**Max. Marks**	: 100
Credits	: 3	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To introduce the students the fundamental concepts of Statistical methods.
- To enrich them with the Statistical methods such as Measures of Central Tendencies, Measures of Dispersion, Correlation and Regression.
- To make the students to acquire the knowledge on Time Series and Index Numbers.

UNIT I

Statistics: Introduction -Statistical methods- Limitations of Statistics-Misuses - Measures of Averages: Mean- Weighted Arithmetic Mean, Combined Mean, Geometric Mean, Harmonic Mean, Median, Quartile and Mode[1].

UNIT II

Measures of Dispersion: Range-Quartile Deviation-Mean Deviation- Relative Measure Standard Deviation[3]- Relative Measure

UNIT III

Correlation[6]: Numerical Value of the Correlation Coefficient- Rank Correlation- Regression

UNIT IV

Time Series: Measurement of Trend: Graphic Method- Semi Average Method- Moving Average Method[7]. Measures of Seasonal variation: Method of Averages-Moving Average Method- Ratio to Moving Average- ratio to trend.

UNIT V

Index Numbers: Simple Aggregate Index[12]- Weighted Aggregate Index- Laspeyre's Index Passche's Index-Fisher's Ideal Price Index.

UNIT VI

Importance of statistics with respect to Central Tendencies in our life and business: discussions[12]

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[6]Flipped Learning
[7]Inquisitive Learning
[12]Scenario Analysis Based Learning

Materials for Study & Reference:

Text Book

1. P.R. Vital, Business Mathematics and Statistics, Margham Publications, Chennai, Reprint 2010

Reference Book(s):

1. S.P. Gupta, Statistical Methods, Sultan Chand and Sons Publishers, New Delhi, 2004
2. V.K.Kapoor, Fundamentals of Applied Statistics, Sultan Chand and Sons Publishers, New Delhi, 2007

Web Resources:

- https://nptel.ac.in/courses/111/104/111104120/
  Prof Shalabh, Department of Mathematics, IIT Kanpur
  Lecture 14 Arithmetic mean
  Lecture 15 Median
  Lecture 16 Quartiles
  Lecture 17 Mode and Geometric mean
  Lecture 20 Mean and standard deviation
- https://www.youtube.com/watch?v=zlZaOnBbpUg
  (1 lesson by Prof. Arunkanda, Department of Mechanical Engineering, IIT ,Delhi)
  Lecture 35 - Analysis of Time Series
- https://www.youtube.com/watch?v=JT9o8b43Gk0
  Index numbers

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1**	Recognize the concept of statistics.
CO2	**K1K2**	Understand the various statistical methods
CO3	**K2 K3**	Categorize the concept of population and sample-quantitative - qualitative data
CO4	**K2K4**	Analyze parametric and non-parametric data
CO5	**K2K3**	Understand Time Series

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓					✓	✓			
CO2		✓				✓	✓	✓		
CO3		✓	✓				✓		✓	
CO4		✓		✓			✓			✓
CO5				✓	✓		✓		✓	

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-II: Skill Enhancement Course - II
ADVANCED EXCEL LAB

Course Code : **23UCASEC02** **Max. Marks** : 100
Credits : 2 **Internal Marks** : 40
External Marks : 60

Course Objectives:

- To make the students to acquire the practical knowledge of working in MS-Excel

Exercises [1,3,5,6] :

1. Applying Mathematical and Text Functions
2. Sorting and Filtering
3. Apply Macro and conditional formatting
4. Use Logical Functions
5. Apply Data Validation
6. Goal Seek and Consolidating data from multiple sheets
7. Use Lookup Functions
8. Use Pivot Tables
9. Prepare Charts and Slicers
10. Importing data from Notepad

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[5]Exploratory Learning
[6]Flipped Learning

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

CO1	**K1 K2**	To perform Mathematical and Text functions
CO2	**K3**	To list out the data's by using sort and filter
CO3	**K4**	To perform Data validation and Lookup functions
CO4	**K4**	To create charts and change its characteristics
CO5	**K5**	To import data from other packages

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓	✓			✓
CO2		✓	✓			✓		✓	✓	✓
CO3			✓	✓		✓	✓			✓
CO4				✓			✓	✓	✓	
CO5				✓	✓	✓		✓	✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-II: Skill Enhancement Course - III
COMPUTER GRAPHICS LAB

Course Code	: **23UCASEC03**	**Max. Marks**	: 100
Credits	: 2	**Internal Marks**	: 40
		External Marks	: 60

Course Objectives:

- Gain proficiency in using gradients, patterns, and effects to enhance the artwork and graphics.
- Apply the skills to real-world projects and create professional-quality designs for print, web, and multimedia.
- Gain proficiency in using filters, effects, and brushes to enhance the images and artwork.
- Discover best practices for organizing the workflow and managing the projects efficiently.

LAB EXERCISES [1,3,5,6]:

1. Create a greeting card (Good Morning) by using brushes and shapes
2. Creation of a single image from selected portions of many images
3. Design an invitation for birthday with multi-layers of images and texts
4. Design a banner for Teachers Day Celebration
5. Create a logo in Corel Draw using Weld and Trim techniques.
6. Design a text “CDAP” using 3D effect and apply a shadow.
7. Create a Cartoon character and decorate the character with fill color
8. Create a logo, visiting card and letter head for a jewelry shop

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[5]Exploratory Learning
[6]Flipped Learning

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

CO1	**K1 K2**	Understanding about system essentials and File format essentials.
CO2	**K2 K4**	Provides complete information about Toolbox, Palettes and essentials about Selecting tools.
CO3	**K3 K5**	Improves the ability to edit images by knowing about drawing tools and Editing tools.
CO4	**K3 K4**	Exploring about color essentials and different manipulation layers.
CO5	**K5**	Create and edit an image using recognized tools

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓					✓	✓	✓	✓
CO2		✓		✓		✓			✓	✓
CO3			✓		✓		✓	✓		✓
CO4			✓	✓		✓			✓	
CO5				✓	✓		✓		✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester - II
ENVIRONMENTAL STUDIES

Course Code: 23UCAES01 **Max. Marks: 100**
Credits: 2 **Internal Marks: 25**
External Marks: 75

Course Objectives:

- To enable the students to understand the importance of natural resources and its associated problems.
- To make the students to understand the eco systems, bio-diversity and its conservation.
- To create awareness among the students about the hazards of Environmental Pollution.

UNIT I

The Multidisciplinary nature of environmental studies Definition, scope and importance.
Need for public awareness

UNIT II

Natural Resources[1]: Renewable and non-renewable resources: Natural resources and associated problems.

1. Forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
2. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems.
3. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
4. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
5. Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.
6. Land resources: Land as resources, land degradation, man induced Landslides, soil erosion and desertification.
7. Role of an individual in conservation of natural resources.
8. Equitable use of resources for sustainable lifestyles.

UNIT III Ecosystems[1]0

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession.
- Food chains, food webs and ecological pyramids

Introduction, types, characteristic features, structure and function of the following ecosystem:

- Forest ecosystem
- Grassland ecosystem
- Desert ecosystem
- Aquatic ecosystems, (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT IV Biodiversity and its conservation

- Introduction – Definition: Genetic, species and ecosystem diversity
- Bio-geographical classification of India
- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values
- Biodiversity at global, National and local levels
- India as a mega-diversity nation[4]
- Hot-spots of biodiversity
- 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 V Environmental Pollution[8]

Definition Causes, effects and control measures of: Air Pollution- Water Pollution-.Soil Pollution -. Marine Pollution- Noise pollution- Thermal Pollution- Nuclear hazards

- Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Pollution case studies
- Disaster management: floods, earthquake, cyclone and landslides

Social Issue:

- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and Control of Pollution) Act.
- Wildlife Protection Act.
- Forest Conservation Act.

UNIT VI

The current status of environmental cleanliness and sanitation in and around our house and in the society

Pedagogical method used:

[1]Blended Learning
[4]E-mind Map
[8]JIGSAW
[10]Participative Learning

Materials for Study & Reference:

References:

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.
2. Brunner R.C. 1989, Hazardous Waste Incineration, McGraw Hill Inc 480 p
3. Clark R.S. Marine Pollution, Clanderson Press Oxford (TB)
4. Cunningham, W.P.Cooper, T.H.Gorhani E & Hepworth, M.T. 2001.
5. De A.K. Environmental Chemistry, Wiley Eastern Ltd
6. Down to Earth, Centre for Science and Environment (R)
7. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford University, Press 473p.

E-Books:

- https://www.kopykitab.com/Environmental-Studies-ebook-By-Dr-J-P-Sharma
- https://www.pdfdrive.net/environmental-science-books.html

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1**	Understand the fundamental idea about understanding the functions of natural system
CO2	**K1**	Identify Renewable and non-renewable resources
CO3	**K2K3**	Analyze Natural resources and its associated problems like pollution etc.,
CO4	**K3K4**	Understand the concepts, Structure and function of an ecosystem
CO5	**K5**	Analyze Environmental Pollution

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓					✓	✓			
CO2	✓	✓						✓		
CO3		✓	✓			✓	✓			
CO4			✓	✓				✓		✓
CO5					✓	✓	✓		✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI

Centre for Differently Abled Persons

Bachelor of Computer Applications

மூன்றாம் பருவம் - தாள் - 3

தமிழக வரலாறும் பண்பாடும்

Course Code	: **23UCACL03**	**Max. Marks**	: 100
Credits	: 3	**Internal Marks**	: 25
		External Marks	: 75

பாட நோக்கம்.

- தமிழக வரலாற்றை அறிந்து கொள்ளுதல்
- தமிழரின் வாழ்வியல் தொன்மையை அறிதல்
- தமிழரின் பண்பாட்டினை அறிந்துகொள்ளல்
- தமிழர்மேல் நிகழ்ந்த பிற பண்பாட்டுத் தாக்கங்களை அறிதல்
- தமிழ் இலக்கியம் சார்ந்த போட்டித் தேர்வுகளுக்கு ஏற்ப கற்பித்தல் நடைமுறைகளை மேற்கொள்ளுதல்

அலகு 1 பழங்கால வரலாறும் சங்க கால வரலாறும்

- தொல் தமிழர், பழைய கற்காலம்
- புதிய கற்காலம்
- உலோகக் கற்காலம்
- அகழ்வாராய்ச்சியில் தமிழும் தமிழரும் (கீழடி வரை)
- திணை வாழ்வியல் (கனவு வாழ்க்கை, கற்பு வாழ்க்கை, உணவு, அணிகலன்கள், வாணிகம், விளையாட்டுக்கள்)[1]கல்வியும் கலைகளும்
- தமிழ் வளர்த்த சங்கம்
- சங்க கால ஆட்சி முறை
- அயல்நாட்டு தொடர்புகள்

அலகு 2 ஆட்சியர் வரலாறு

- மூவேந்தர் வரலாறு
- பல்லவர் வரலாறு
- நாயக்கர் ஆட்சி
- முகம்மதியர் ஆட்சி[6]
- மராட்டியர் ஆட்சி

அலகு 3 ஐரோப்பியர் கால வரலாறு

- போர்த்துகீசியர்
- டச்சுக்காரர்கள்
- டேனிஸ்காரர்கள்
- பிரெஞ்சுகாரர்கள்
- ஆங்கிலேயர்கள்[10]
- பாளையக்காரர்கள்
- இந்திய விடுதலை போராட்டத்தில் தமிழ்நாடு

அலகு 4 விடுதலைக்குப் பின் தமிழ்நாட்டு வரலாறு

- மொழிப் போராட்டம்
- சமூக மறுமலர்ச்சி[11]
- தொழில்நுட்ப வளர்ச்சி

அலகு 5 மொழி பயிற்சி

- நிறுத்தக் குறிகள்
- கலைச்சொற்கள்
- மொழிபெயர்ப்பு

பயிற்சி: ஆங்கில கலைச்சொற்களைக் கொடுத்து அவற்றை தமிழில் மொழிபெயர்க்கச் செய்தல்

Pedagogical method used:

[1]Blended Learning
[6]Flipped Learning
[10]Participative Learning
[11]Reflective Learning

Text books

1. தமிழக வரலாறும் பண்பாடும் –கே கே பிள்ளை, உலக தமிழ் ஆராய்ச்சி நிறுவனம், சென்னை
2. தமிழர் நாகரிகமும் பண்பாடும்- அ. தட்சிணாமூர்த்தி, யாழ் வெளியீடு, சென்னை
3. தமிழக வரலாறும் பண்பாடும் – வே. தி. செல்லம், மணிவாசகர் பதிப்பகம் சென்னை
4. ஆதிச்சநல்லூர் முதல் கீழடி வரை - நுவேதா லூயிஸ், கிழக்குப் பதிப்பகம், சென்னை
5. பண்பாட்டு மானிடவியல் - பக்தவச்சல பாரதி, அடையாளம் பதிப்பகம், திருச்சி
6. தமிழர் மேல் நிகழ்ந்த பண்பாட்டுப் படையெடுப்புகள், சு. ப. அறவாணன், தமிழ்த்தோட்டம், சென்னை.

பார்வை நூல்கள்

1. தமிழக சமுதாய பண்பாட்டு கலை வரலாறு –கு. சேதுராமன், என்.சி.பி.எச், சென்னை.
2. தமிழர் கலையும் பண்பாடும் – அ. கா. பெருமாள், என்.சி.பி.எச், சென்னை.
3. ஒரு பண்பாட்டின் பயணம்: சிந்து முதல் வைகை வரை – ஆர். பாலகிருஷ்ணன், ரோஜா முத்தையா ஆராய்ச்சி நூலகம், சென்னை
4. தமிழும் பிற பண்பாடும் – தெ. பொ. மீனாட்சி சுந்தரனார், நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை.
5. தமிழக வரலாறும் பண்பாடும் - நீலகண்ட சாஸ்திரி, ஸ்ரீசெண்பகா பதிப்பகம், சென்னை
6. தமிழர் வரலாறும் தமிழர் பண்பாடும் – மா. இராசமாணிக்கனார்.
7. தமிழர் நாகரிக வரலாறு- க. ந. திருநாவுக்கரசு, தொல்காப்பியர் நூலகம், சென்னை.

மாணவர் பெறும் திறன்

இப்பாடத்தைக் கற்பதால் பின்வரும் பயன்களை மாணவர் அடைவர்

CO1	**K1**	தமிழக வரலாற்றை அறிந்துகொள்வர்
CO2	**K2 K3**	தமிழரின் வாழ்வியல் தொன்மையை அறிவர்
CO3	**K1 K3**	தமிழரின் பண்பாட்டுக் கூறுகளை அறிந்துகொள்வர்
CO4	**K3 K4**	பிற பண்பாட்டுத் தாக்கம் மற்றும் அணுகுமுறைகளை அறிவர்
CO5	**K3 K4**	மொழிபெயர்ச்சிக்குத் தேவையான இலக்கணங்களைக் கற்பர்

Mapping with Program Outcomes

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓				
CO2		✓	✓			✓	✓		✓	
CO3			✓				✓	✓	✓	
CO4				✓	✓		✓	✓		✓
CO5			✓	✓			✓		✓	✓

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BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
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Bachelor of Computer Applications
Semester-III: English Language Course-III
GENERAL ENGLISH - III

Course Code	: **23UCAGE03**	**Max. Marks**	:100
Credits	: 3	**Internal Marks**	: 25
		External Marks	: 75

Objectives:
On completion of the course, the students should be able to

- To make them active listeners
- To enhance the interpersonal relationship skills
- To embolden them to cope with stress
- To master grammar skills
- To help them to use English effectively in a business environment

Unit I - ACTIVE LISTENING
Short Story: In a Grove – Akutagawa Ryunosuke, Translated from Japanese by Takashi Kojima, The Gift of the Magi – O' Henry, Prose: Listening – Robin Sharma, Nobel Prize Acceptance Speech – Wangari Maathai [1,5]

UNIT II - INTERPERSONAL RELATIONSHIPS
Prose: Telephone Conversation – Wole Soyinka, Of Friendship – Francis Bacon,
Song on (Motivational/ Narrative): Ulysses – Alfred Lord Tennyson, And Still I Rise – Maya Angelou

Unit III - COPING WITH STRESS
Poem: Leisure – W.H. Davies, Anxiety Monster – Rhona Mc Ferran, Readers Theatre: The Forty Fortunes: A Tale of Iran, Where there is a Will – Mahesh Dattani

Unit IV - GRAMMAR
Phrasal Verbs & Idioms, Modals and Auxiliaries, Verb Phrases – Gerund, Participle, Infinitive [6, 10]

Unit V - WRITING SKILL
Composition/ Writing Skills: Official Correspondence – Leave Letter , Letter of Application, Permission Letter, Drafting Invitations, Brochures for Program and Events.

UNIT VI - Present Contours
Present status of English writing and presentation skills of the students: Group discussions-seminar – presentation skills [11, 12]

Pedagogical method used:
[1]Blended Learning
[5]Exploratory Learning
[6]Flipped Learning
[10]Participative Learning
[11]Reflective Learning
[12]Scenario Analysis Based Learning

Materials for Study & Reference:

Text Books:

1. Wangari Maathai – Nobel Lecture. Nobel Prize Outreach AB 2023. Jul 2023.
2. Mahesh Dattani, Where there is a Will. Penguin, 2013.
3. Martin Hewings, Advanced English Grammar, Cambridge University Press, 2000
4. Essential English Grammar by Raymond Murphy

Web Resources:

1. Wangari Maathai – Nobel Lecture. Nobel Prize Outreach AB 2023. Mon. 17 Jul 2023. https://www.nobelprize.org/prizes/peace/2004/maathai/lecture/
2. Telephone Conversation - Wole Soyinka https://www.k-state.edu/english/westmank/spring_00/SOYINKA.html
3. Anxiety Monster- RhonaMcFerran- www.poetrysoup.com

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1**	Listen actively
CO2	**K2 K3**	Develop interpersonal relationship skills
CO3	**K3 K4**	Acquire self-confidence to cope with stress
CO4	**K2 K3**	Master grammar skills
CO5	**K4 K5**	Carry out business communication effectively

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓					✓				
CO2	✓	✓	✓				✓	✓		
CO3			✓	✓				✓	✓	
CO4	✓	✓	✓				✓	✓		
CO5				✓	✓				✓	✓

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Bachelor of Computer Applications
Semester-III: Core Course- III
DATA STRUCTURES AND ALGORITHMS

Course Code	: **23UCACC03**	**Max. Marks**	:100
Credits	: 5	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To understand the concepts of ADTs
- To learn linear data structures - lists, stacks, queues
- To learn Tree structures and application of trees
- To learn graph structures and application of graphs
- To understand various sorting and searching

UNIT I

Abstract Data Types (ADTs) - List ADT-array-based implementation - linked list implementation singly linked lists[3] - circular linked lists – doubly – linked lists – applications of lists – Polynomial Manipulation – All operations – Insertion – Deletion – Merge - Traversal[1]

UNIT II

Stack ADT[1] – Operations – Applications – Evaluating arithmetic expressions - Conversion of infix to postfix expression – Queue ADT – Operations – Circular Queue – Priority Queue – deQueue - applications of queues

UNIT III

Tree ADT - tree traversals – Binary Tree ADT[7] – expression trees - applications of trees - binary search tree ADT - Threaded Binary Trees - AVL Trees - B-Tree - B+Tree – Heap – Applications of heap

UNIT IV

Definition – Representation of Graph[10] – Types of graph – Breadth first traversal – Depth first traversal - Topological sort - Bi - connectivity – Cut vertex – Euler circuits – Applications of graphs [9]

UNIT V

Searching - Linear search - Binary search – Sorting - Bubble sort – Selection sort – Insertion sort – Shell sort – Radix sort – Hashing[9] – Hash functions – Separate chaining – Open Addressing – Rehashing Extendible Hashing

UNIT VI

The importance of Data Structures and Algorithms : Seminar & Discussion[10]

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[7]Inquisitive Learning
[9]Mobile Learning
[10]Participative Learning

Text Books

1. Seymour Lipschutz, "Data Structures", Tata McGraw Hill Publishing Company Limited, New Delhi, 2014.

Reference Book

1. Jean Paul Tremblay and Paul G. Sorenson, *An Introduction To Data Structures with Applications*, Tata McGraw-Hill, Second Edition
2. Ellis Horowitz, SartajSahni and Dinesh Mehta, "Fundamentals of Data Structures in C++", UniversityPress (India) Pvt. Ltd., Hyderabad, 2007

E-Books:

- https://dcetit.wordpress.com/2013/03/09/ebook-ds-fundamentals-of-data-structures-ellis-horowitz-sartaj-sahni
- http://freecomputerbooks.com/Fundamental-Data-Structures-Wikibook.html

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1 K2**	Understanding the basic concepts of Data Structures and Stacks.
CO2	**K1 K4 K5**	Exploring the different concepts of queues and linked lists.
CO3	**K2 K3**	To understand the trees concept and types of trees.
CO4	**K3 K4**	To solve the problems using algorithms in Graphs.
CO5	**K5**	To know the Sorting and Searching Techniques.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓	✓	✓		
CO2	✓	✓	✓				✓	✓		
CO3		✓	✓			✓		✓	✓	
CO4			✓	✓			✓		✓	
CO5				✓	✓				✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-III: Core Practical - III
DATA STRUCTURES AND ALGORITHMS LAB

Course Code : **23UCALC03**
Credits : 5

Max. Marks :100
Internal Marks : 40
External Marks : 60

Course Objectives:

- To understand the concepts of ADTs
- To learn linear data structures - lists, stacks, queues
- To learn Tree structures and application of trees
- To learn graph structures and application of graphs
- To understand various sorting and searching

LAB EXERCISES [1,3,5,6]:

1. Write a program to implement the stack using array.
2. Write a program to implement the queue.
3. Write a program to implement the doubly linked list.
4. Write a program that reads an infix expression, converts the expression to postfix form.
5. Write a program for implementing the bubble sort.
6. Write a program for implementing the binary search.
7. Write a program to add two polynomial expressions.
8. Write a program to perform the AVL-tree operations.
9. Write a program for the implementation of BFS for a given graph.
10. Write a program for implementing the insertion sort.

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[5]Exploratory Learning
[6]Flipped Learning

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

CO1	**K1**	Implement the linear data structures such as stacks and queues using array.
CO2	**K2K4**	Implementing linked list and evaluation of the given expression.
CO3	**K2 K3**	Implement various kinds of sorting and searching.
CO4	**K4 K5**	Understand and implements non-linear data structures such as trees, graphs.
CO5	**K3**	Understanding and implementing addition of two polynomial expressions.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓		✓			✓	✓	✓		
CO2		✓		✓				✓	✓	
CO3	✓		✓			✓		✓	✓	
CO4				✓	✓	✓	✓			✓
CO5			✓			✓		✓	✓	

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
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Bachelor of Computer Applications
Semester-III Elective Course - III
FINANCIAL ACCOUNTING

Course Code : 23UCAEC03A **Max. Marks : 100**
Credits : 3 **Internal Marks : 25**
External Marks : 75

Course Objectives:

- To introduce the basic concepts of accounting.
- To provide better knowledge on purchase book, Subsidiary books, cash book, Sales Book, etc.
- To enrich the knowledge on depreciation, bill transactions, etc.

UNIT I
Introduction - Accounting Concepts and conventions[1] – Journal – Ledger - Trail Balance.

UNIT II
Subsidiary books – purchase Book - Purchase return Book – Sales Book - Sales return Book - Cash Book.

UNIT III
Final Accounts of a sole trader – Adjustments – Outstanding and prepaid expenses, income received in advance and accrued income[3]- Provision on Debtors and Creditors - Interest on Capital and Drawings - Depreciation.

UNIT IV
Depreciation – Meaning – Methods - Straight line method - Diminishing balance method only

UNIT V
Bills of Exchange – Bill Transaction, Discounting, Endorsement[5] – Sending Bill for Collection, Noting of a Bill, Renewal of a Bill – Insolvency of Acceptor - GST

UNIT VI
Application of accountancy in our day-to-life: discussions[12]

Pedagogical method used:
[1]Blended Learning
[3]Constructivist Learning
[5]Exploratory Learning
[12]Scenario Analysis Based Learning

Materials for Study & Reference:
Text Books:

1. M. C. Shukla, T.s Grewal, S. C. Gupta , "Advanced Accountancy (vol-1)" , Chand & Co. LTD, New Delhi, 2016.

References:

1. S.P.Jain and B.L Narang , Advanced Accountancy , Kalyani Publishing, New Delhi,2012.
2. R.L.Gupta and M.Radhaswamy,Advanced Accountancy, S.Chand Publication, New Delhi Hall, 2012.

E-Books:

- https://www.pinterest.com/pin/761741724443071437/
- http://www.free-management-ebooks.com/dldebk/dlfi-principles.htm

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1**	Classify the journal entries
CO2	**K3**	Calculate the Trail Balance
CO3	**K2K3**	Understand the concept of Subsidiary Books, Final Accounts, Branch Accounts
CO4	**K4K5**	Prepare the Balance sheet
CO5	**K6**	Evaluate depreciation, Calculate bills of exchange

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓					✓	✓			
CO2	✓		✓					✓		
CO3		✓	✓		✓	✓	✓			
CO4			✓	✓				✓	✓	
CO5				✓	✓		✓			✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-III: Skill Enhancement Course - IV
ANIMATION LAB

Course Code	: **23UCASEC04**	**Max. Marks**	:100
Credits	: 2	**Internal Marks**	: 40
		External Marks	: 60

Course Objectives:

- Develop the skills needed to create 2D animations from concept to completion.
- Master the principles of animation and apply them effectively to bring characters and objects to life.

LAB EXERCISES [1,3,5,6]:

1. Frame by Frame Animation:
    a. Moving a Ball across the stage
    b. Blinking of Stars
    c. Changing the color of Text
2. Motion Tween:
    a. Animate a Moon with Growing & Shrinking Effect
    b. Display your Name from different direction – Character by Character
3. Creation of slide show for department function
4. Shape Tween - Convert "CDAP" into an Image (Text to Shape)
5. Bouncing a Ball in the Staircase using Guide Layer
6. Creating a text animation effect with the help of tween and Masking
7. Creation of a moral story
8. Create a cartoon animation using objects and images

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[5]Exploratory Learning
[6]Flipped Learning

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

CO1	**K1 K2**	Understanding about system essentials and File format essentials.
CO2	**K 2K4**	Provides complete information about Toolbox and Palette. Essentials of creating simple animation.
CO3	**K3 K5**	Improves the ability of animation by using tweens.
CO4	**K3 K4**	Exploring about Masking and guide layer.
CO5	**K5**	Create a moral story by using symbols.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓					✓	✓	✓	
CO2		✓	✓			✓			✓	
CO3			✓		✓		✓	✓		✓
CO4				✓	✓	✓			✓	
CO5			✓	✓			✓	✓		✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-III: Skill Enhancement Course - V
OPEN SOURCE SOFTWARE TECHNOLOGIES

Course Code	: **23UCASEC05**	**Max. Marks**	:100
Credits	: 2	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- Able to Acquire the basic concepts of open source, open source software's and understand about Linux.
- Acquire knowledge about Linux and Unix commands.
- To identify the significance and application of Apache server.
- Understand about Database Access with PHP–MySQL.

UNIT -I
Open Source – open source vs. commercial software[1] – What is Linux - Free Software – Where I can use Linux - Linux kernel – Linux distributions.

UNIT -II
Introduction Linux Essential Commands –File System concept –Standard Files –The Linux Security Model – Introduction to Unix – Unix Components Unix Files–File Attributes and Permission – Standard I/O – Redirection – Pipes and Filters[3] – Grep and Stream Editor.

UNIT -III
Introduction - Apache Explained – Starting, Stopping and Restarting Apache – Modifying the Default configuration – Securing Apache[3] – Set user and Group.

UNIT-IV
MySQL: Introduction to MySQL – The show databases and table – The USE command – Create Database and Tables – Describe Table[5] – Select, Insert, Update and Delete statement database.

UNIT -V
I**ntroduction** – PHP Form processing[7] – Database Access with PHP–MySQL, MySQL Functions – Inserting Records – Selecting Records – Deleting Records – Update Records.

UNIT -VI
Discuss the importance of open source software: Seminar & Discussions

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[4]E-mind Map
[5]Exploratory Learning
[7]Inquisitive Learning

Materials for Study & Reference:

Text Books*:*

1. LINUX, Apache, MySQL, Perl and PHP, Dorling Kindersley (India) Pvt. Ltd, 2008

References:

1. Eric Rosebrock, EricFilson, Setting up LAMP: Getting Linux, Apache, MySQL and PHP and working together, John Wiley and Sons, 2004.
2. Anthony Butcher, Teach Yourself MySQL in 21 days, 2nd Edition, Sams Publication.
3. Rich Bower, Daniel Lopez Ridreejo, Alian Liska, Apache Administrator's Handbook, Sams Publication.

E-Books:

- Introduction to Open-Source and its benefits – Geeks for Geeks
- https://www.bing.com/

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1**	Understand the concept of Open Source, Linux and Linux Kernel.
CO2	**K2 K3**	Implementing Linux security model and learn Unix environment.
CO3	**K4**	To gain the knowledge of Apache server and its default configuration.
CO4	**K3 K5**	Understanding how to create MySQL table and how to manipulate.
CO5	**K4 K5**	Learn about PHP and Database Access with PHP–MySQL.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓	✓	✓		
CO2		✓	✓			✓		✓	✓	
CO3			✓	✓		✓		✓	✓	
CO4			✓		✓	✓	✓			✓
CO5				✓	✓	✓	✓	✓	✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-III Non Major Elective - I
YOGA PRACTICES

Course Code : **23UCANMEC01** **Max. Marks** : 100
Credits : 2 **Internal Marks** : 40
External Marks : 60

Course Objectives:
To enable the students to:

- Understand the principle and practice of different type of Physical Exercises
- Demonstrate selected Asana and perform its procedure.
- Understand its benefits, limitation and subtle points of each practice

Exercise[1,3,5]

Based on the type of disability, the students will be made to practice and perform the selected Physical Exercises, Asanas.

Pedagogical method used:
[1]Blended Learning
[3]Constructivist Learning
[5]Exploratory Learning

Materials for Study and References:
Text Books:

1. Swami Dhirendra Bhrahmachari: Yogasana Vijnana, Dhirendra Yoga Publications, New Delhi.
2. Swami Kuvalyananda: Asana Kaivalyadhama, Lonavla
3. Simplified Physical Exercises – Thathuvagnani Vethathiri Maharishi

References:

1. Basavaraddi, I.V. & others: Yogasana: A Comprehensive description about Yogasana, MDNIY, New Delhi, 2011.

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

CO1	**K1**	Develop concentration and focus
CO2	**K2 K3**	Focus their mind and manage stress
CO3	**K4**	Improves their loco motor skills and psycho-motor coordination
CO4	**K3 K5**	Improving self-confidence, self-sufficiency and sociability
CO5	**K4 K5**	Improve interpersonal and intrapersonal relationships

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓	✓	✓		
CO2		✓	✓			✓		✓		
CO3			✓	✓		✓		✓		
CO4					✓	✓	✓			✓
CO5				✓	✓	✓	✓	✓	✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
நான்காம் பருவம் - தாள் - 4
தமிழும் அறிவியலும்

Course Code : **23UCACL04** **Max. Marks** : 100
Credits : 3 **Internal Marks** : 25
External Marks : 75

பாட நோக்கம்

1. தாய்மொழி வழியாக அறிவியல் பற்றிய சிந்தனைகளை வளர்த்தல்
2. அறிவியல் கலைச் சொல்லாக்கம் பற்றிப் பயிற்றுவித்தல்
3. மாணவர்களுக்கு அறிவியல் பார்வையை ஏற்படுத்துதல்
4. தமிழில் அறிவியல் படைப்பிலக்கியங்களை உருவாக்கத் தூண்டுதல்
5. தமிழ் இலக்கியம் சார்ந்த போட்டித் தேர்வுகளுக்கு ஏற்ப கற்பித்தல் நடைமுறைகளை மேற்கொள்ளுதல்

அலகு 1 - தமிழரின் அறிவியல் சிந்தனைகள்

- அறிவியலும் மனித வாழ்வும்
- ஐந்திணைப் பகுப்பும் சூழலியலும்[1]
- தொழில்நுட்ப மேலாண்மை
- நீர் நீல மேலாண்மை

அலகு 2 - பழந்தமிழ் இலக்கியங்களில் அறிவியல் சிந்தனைகள்

- நிலவியல்
- உலோகவியல்
- வானவியல் [5,6]
- உயிரியல்
- உளவியல்

அலகு 3 - இடைக்கால இலக்கியங்களில் அறிவியல் சிந்தனைகள்

- காப்பியங்களில் அறிவியல்
- சிற்றிலக்கியங்களில் அறிவியல்
- உரைநூல்களில் அறிவியல[10]

அலகு 4 - இணையத் தமிழ்

- இணையத் தமிழ் பயன்பாடு - அறிமுகம்
- இணையத்தமிழ் கல்விக்கழகம்[6]
- இணைய நூலகம்
- செயற்கை நுண்ணறிவியல்[10]
- தமிழ்நாட்டு அறிவியல் ஆளுமைகள்

அலகு 5 - கடிதம் எழுதுதலும் கட்டுரை எழுதுதலும்

- உறவு முறைக் கடிதப் பயிற்சி
- அலுவலகக் கடித பயிற்சி
- விண்ணப்ப படிவம் எழுதும் பயிற்சி
- தன் விவரப் படிவம் எழுதும் பயிற்சி[10]
- கருத்து விளக்கக் கட்டுரைகள் எழுதும் பயிற்சி
- பத்திரிகைகளுக்குக் கட்டுரை எழுதும் பயிற்சி .

Pedagogical method used:

[1]Blended Learning
[5]Exploratory Learning
[6]Flipped Learning
[10]Participative Learning

Text Books

1. அறிவியல் தமிழ் இன்றைய நிலை, - ராதா செல்லப்பன், உலக தமிழ் ஆராய்ச்சி நிறுவனம், சென்னை
2. மணவை முஸ்தபா, தமிழில் அறிவியல் படைப்பிலக்கியம், மணவை பப்ளிகே'ன், சென்னை
3. கலைச் சொல்லாக்கம் - மங்கை, ரங்கராசபுரம், சென்னை

பார்வை நூல்கள்

1. தமிழர் வேளாண் மரபுகள். இல. செ. கந்தசாமி
2. சங்க இலக்கியத்தில் வேளாண் சமுதாயம் - பெ மாதையன், நியூ செஞ்சுரி புக் ஹவுஸ்
3. தமிழில் அறிவியல் இதழ்கள் - சாமுவேல் ரா. பார்வேந்தன், ∴பி'கிறீன் பதிப்பகம் கோவை
4. அறிவியல் தமிழ் - பதிப்பாசிரியர் இராதா செல்லப்பன், பாரதிதாசன் பல்கலைக்கழகம், திருச்சிராப்பள்ளி
5. இணையத் தமிழ் வரலாறு- மு பொன்னவைக்கோ, பாரதிதாசன் பல்கலைக்கழகம்
6. இளைய தமிழ் -சந்திரிகா சுப்பிரமணியன், சந்திரோதயம் பதிப்பகம்.
7. இணையமும் இனிய தமிழும் – துரை. மணியரசன், இசை பதிப்பகம்
8. கணினி தமிழ் – இல. சுந்தரம், விகடன் பிரசுரம்
9. மாண்புமிகு மண், பாமயன், வம்சி புக்ஸ்
10. தமிழ் இலக்கியத்தில் அறிவியல் சிந்தனைகள் - வானதி பதிப்பகம்.

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மாணவர் பெறும் திறன்

இப்பாடத்தைக் கற்பதால் பின்வரும் பயன்களை மாணவர் அடைவர்

CO1	**K1**	தாய்மொழி வழியாக அறிவியல் பற்றிச் சிந்திக்கும் திறன் பெற்றிருப்பார்
CO2	**K2 K3**	அறிவியல் கலைச்சொல்லாக்கம் பற்றிய விதிகள், நுணுக்கங்களைத் தெரிந்திருப்பர்
CO3	**K1 K3**	அறிவியல் தமிழ் வளர்ச்சியில் மொழிபெயர்ப்பின் பங்கு குறித்து அறிந்திருப்பர்
CO4	**K4**	மொழியறிவோடு சிந்தனைத் திறனைப் பெறுவர்

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓				
CO2		✓	✓			✓	✓		✓	
CO3	✓	✓					✓	✓	✓	
CO4				✓	✓				✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-IV: English Language Course -IV
GENERAL ENGLISH - IV

Course Code : **23UCAGE04** **Max.Marks** :100
Credits : 3 **Internal Marks** : 25
External Marks : 75

Objectives:

- To help learners imbibe goal-setting attitude.
- To enable them to understand the value of integrity.
- To help them deal with emotions.
- To teach the learners to frame sentences using tenses.
- To enhance reporting skills.

Unit I - GOAL SETTING (UNICEF)
Life Story: From Chinese Cinderella – Adeline Yen Mah, Why I Write - George Orwell,
Short Essay: On Personal Mastery – Robin Sharma, On the Love of Life – William Hazlitt

Unit II - INTEGRITY
Short Story: The Taxi Driver – K.S. Duggal, Kabuliwala - Rabindranath Tagore, A Retrieved Reformation – O Henry,
Extract from a play: The Quality of Mercy (Trial Scene from the Merchant of Venice - Shakespeare) [1,3]

Unit III- COPING WITH EMOTIONS
Poem: Pride – Dahlia Ravikovitch, Phenomenal Woman – Maya Angelou,
Reader's Theatre: The Giant's Wife A Tall Tale of Ireland – William Carleton, The Princess and the God : A Tale of Ancient India[6]

Unit IV - LANGUAGE COMPETENCY SENTENCES
Simple Sentences, Compound Sentences, Complex Sentences, Direct and Indirect Speech

Unit V - WRITING SKILLS
Report Writing, Narrative Report, Newspaper Report, Drafting Speeches: Welcome Address, Vote of Thanks .

UNIT VI
Application of English language in business communication in the modern world - seminar[8]

Pedagogical method used:
[1]Blended Learning
[3]Constructivist Learning
[6]Flipped Learning
[8]JIGSAW

Materials for Study & Reference:
Text Books:

1. Oxford Practice Grammar , John Eastwood, Oxford University Press
2. Cambridge Grammar of English , Ronald Carter and Michael McCarthy
3. George Orwell Essays, Penguin Classics

Web Resources:

1. http:/www.gradesaver.com/George-orwell-essays/study/summary

2. O' Henry. A Retrieved Reformation.
   https://americanenglish.state.gov/files/ae/resource_files/a-retrieved-reformation.pdf

3. Maya Angelou. Phenomenal Woman.
   https://www.poetryfoundation.org/poems/48985/phenomenal-woman

4. https://www'.oxfordscho1ar1yeditions.coin/disp1ay/10.1093/actrade/9780199235742.book.1/actrade-9780199235742-div1-106- William Hazilitt

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1**	Determine their goals
CO2	**K2 K3**	Identify the value of integrity.
CO3	**K4**	Deal with emotions
CO4	**K3 K4**	Frame grammatically correct sentences
CO5	**K4 K5**	Write cohesive reports.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓		✓		
CO2		✓		✓			✓	✓		
CO3			✓	✓				✓	✓	
CO4				✓	✓			✓	✓	
CO5				✓	✓				✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI

Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-IV: Core Course - IV
PROGRAMMING IN JAVA

Course Code	: **23UCACC04**	**Max. Marks**	:100
Credits	: 5	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To make the students to learn Object-Oriented programming concepts and techniques
- To provide them an exposure in basic concepts of JAVA
- To help them to understand the syntax & methodology of programming in JAVA
- To orient them to study the method of application development using Applets

UNIT I

Introduction: Introduction to Java[1] – Java and Internet – Byte codes – Features of Java – Java Development Environment (JDK) – Java Character set – Operators – Control statements - Java Tokens – Java Statements – Simple programs – Arrays and Vectors – Strings and String-Buffers.

UNIT II

Classes, Interfaces and Packages:[6] Classes – Objects – Constructor - Static block – Static Data –Static Method – String and StringBuffer Classes - Wrapper Classes – Packages and Interfaces.

UNIT III

Inheritance[7]: Inheritance Extending classes – Abstract and Final classes – Interfaces and Inheritance

UNIT IV

Exception Handling: Try Catch blocks[3] – Use of Throw, Throws and Finally – Programmer Defined Exceptions. Multi threaded Programming: Thread Class – Runnable interface – Synchronization – Using synchronized methods – Using synchronized statement - Interthread Communication – Deadlock

UNIT V

Applets and Graphics: Fundamentals of Applets – Java Applets – Applet Life-cycle – Working with Applets – The HTML APPLET Tag. AWT and Event Handling: AWT components and AWT Controls - Events – Event sources – Event Listeners – Handling Mouse and Keyboard Events - Adapter classes[6].

UNIT VI

The importance of JAVA programming for software development: discussions[11]

Pedagogical method used:

[1]Blended Learning
[2]Brain Storming
[3]Constructivist Learning
[6]Flipped Learning
[7]Inquisitive Learning
[11]Reflective Learning

Materials for Study & Reference:

Text Books:

1. Programming with Java, 4th Edition, E. Balagurusamy, Tata McGraw Hill Pub. Ltd., New Delhi, 2009.
2. C. Muthu, "Programming with Java", Vijay Nicole Imprints Pvt. Ltd., Chennai, 2004. ISBN 981-254-265-5

References:

1. Patrick Naughton and Herbert Schildt, " JAVA - The Complete Reference", Ninth Edition, Tata-McGraw-Hill, New Delhi, 2002. (**Unit** I- IV) ISBN: 9780071808569

E-Books:

- https://www.pdfdrive.net/java-books.html
- https://www.eversql.com/best-free-books-for-java-programming-2017

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1 K2**	Understanding Simple Java Programming and basic needs
CO2	**K1 K3**	Identify Classes, Objects, Constructors and Arrays in Java Programming
CO3	**K2 K3**	Achieve code reusability and extensibility by means of Inheritance and Polymorphism.
CO4	**K4 K5**	Understand the complexity of Exception Handling and Multi Threading.
CO5	**K5**	To know about the Applets and Graphics in Java.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓		✓		
CO2		✓	✓			✓	✓		✓	
CO3		✓	✓				✓	✓		
CO4			✓		✓			✓	✓	
CO5				✓	✓	✓		✓	✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI

Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-IV: Core Practical - IV
PROGRAMMING IN JAVA LAB

Course Code : **23UCALC04** **Max. Marks** :100
Credits : 5 **Internal Marks** : 40
External Marks : 60

Course Objectives:

- To provide practical training on Java program to validate user input.
- To train them to write programs based on the concept.
- Able to develop a programs on packages, exception handling, Thread, Applet.

LAB EXERCISES[1,3,5,6]:

1. Write a program for biggest of Three numbers using else…if
2. Write a java program for factorial using recursive function.
3. Write a java program to find the area of a rectangle using constructor.
4. Write a program to perform string operations using StringBuffer class:
   a. Length of a string b. Reverse a string
5. Write a java program to prepare a student details using inheritance.
6. Write a java program using package and interface.
7. Write a java program to create multiple threads using Thread class
8. Write a Java program to implement the concept of Exception Handling.
9. Write a java program to display text on applet window.
10. Write a java program to display basic shapes and fill them with a color

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[5]Exploratory Learning
[6]Flipped Learning

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1**	Learn the basic concepts & techniques of java.
CO2	**K1 K2**	Learn OOPs Concepts through Java Programs.
CO3	**K1 K2 K3**	Create windows and its components using Java Coding
CO4	**K3 K4**	Design various shapes in Java Environment.
CO5	**K4 K5**	Execute the Java files using Java coding

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓					✓	✓		✓	
CO2		✓				✓	✓	✓	✓	
CO3		✓	✓					✓		
CO4		✓	✓	✓		✓	✓	✓		✓
CO5				✓	✓		✓		✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-IV: Elective Course - IV
DATABASE MANAGEMENT SYSTEMS

Course Code	: **23UCA EC04A**	**Max. Marks**	:100
Credits	: 3	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To make the students to learn the basic database services in a dynamic and flexible environment.
- To help them to understand SQL program.
- To equip them with the knowledge on Normalization, Transaction Processing and Concurrency Control.

UNIT I:

Introduction to Database Systems[1]: Basic Concepts and Definitions - Data Dictionary - Database - Database System - Database Administrator - Database System Architecture - Data Independence – Mappings.

UNIT II:

Data Models - Entity-Relational Model - Relational database model – logical view of data-keys – Integrity rules – relational set operators – data dictionary - Normalization[3] - Normal Forms – BCNF.

UNIT III:

Introduction to SQL: Data Definition Commands – Data Manipulation Commands –SELECT Queries – Additional Data Definition Commands – Additional ELECT Query Keywords – Joining Database Tables

UNIT IV:

Advanced SQL: Relational SET Operators: UNION –UNIONALL–INTERSECT-MINUS. SQL Join Operators: Cross Join – Natural Join – Join USING Clause – JOIN ON Clause – Outer Join. **Sub Queries and Correlated Queries**: WHERE – IN – HAVING –ANY and ALL – FROM. SQL Functions: Date and Time Function – Numeric Function–String Function.

UNIT V:

PL/SQL: A Programming Language: History – Fundamentals – Block Structure – Comments – DataTypes – Other Data Types – Variable Declaration –Assignment operation –Arithmetic operators. **Control Structures and Embedded SQL**: Control Structures –Nested Blocks– SQL in PL/SQL – Data Manipulation – Transaction Control statements.

UNIT VI

The importance of DBMS applications: discussions

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[7]Inquisitive Learning
[8]JIGSAW

Materials for Study & Reference:

Text Books:

1. S.K. Singh, "Database Systems - Concepts, Design and Application", Pearson Education, 1st edition,2013.
2. G.K.Gupta, "Database Management System", Tata McGraw Hill Publications Company Limited, New Delhi, 2011.

References:

1. Jeffry D. Ullman, Jennifer Widom, "A First Course in Database Systems", Addison Wesley Longman pvt. Ltd., Delhi, 2001.
2. P.K. Yadav, "Database Management System", Tata McGraw Hill Publications Company Limited, New Delhi, 2013

E-Books:

https://examupdates.in/database-management-system/
http://www.ebooks-for-all.com/bookmarks/detail/Database-Management-Systems/onecat/0.html

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1 K2**	Understand the concepts of Database Concepts and Characteristics.
CO2	**K1 K3**	Learning Architecture & Design of Databases
CO3	**K2 K3**	Designing ER Model Diagram & Understanding RDBMS
CO4	**K2 K4**	Applying Normalization to databases using SQL Comments
CO5	**K4 K5**	Explore the concepts of PL/SQL Concepts

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓			✓	
CO2		✓	✓				✓			
CO3			✓	✓		✓		✓		✓
CO4				✓	✓				✓	
CO5				✓	✓		✓			✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-IV: Skill Enhancement Course - VI
WEB DESIGNING LAB

Course Code : **23UCASEC06** **Max. Marks** :100
Credits : 2 **Internal Marks** : 40
External Marks : 60

Course Objectives:

- Understand the basics of HTML and its components
- To study about the Graphics in HTML
- Understand the concepts of static web pages

LAB EXERCISES[1,3,5,6]:

1. A Program to illustrate Text Font tag and comment, h1….h6, text formatting and image.
2. A Program to illustrate Ordered List and Unordered List tags
3. A Program to illustrate CSS (cascading style sheet)
4. Design a simple webpage (To illustrate Embedded Multimedia)
5. Design a Exam Time Table using Table tag
6. Design a Login page using HTML Forms
7. Develop a HTML application form for admission to under graduate course
8. Create an Online Newspaper (Single Page)
9. Create and Show the Bio-Date for 3 Students based on their names using Frames
10. Create 4 pages website about the Family Members

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[5]E-mind Map
[6]Exploratory Learning

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

CO1	**K1**	Understand the formatting text
CO2	**K2**	Understand list in HTML and CSS
CO3	**K2K3**	To create a Webpage for news paper by using images and text
CO4	**K3K5**	Using table to create the time table
CO5	**K2K4**	Demonstrate webpage creation for bio-data using frames

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓		✓			✓	✓			
CO2		✓	✓			✓	✓	✓		
CO3			✓	✓		✓	✓		✓	✓
CO4				✓	✓		✓	✓	✓	
CO5			✓	✓				✓	✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-IV: Skill Enhancement Course: VII
QUANTITATIVE APTITUDE

Course Code	: **23UCASEC07**	**Max. Marks**	: 100
Credits	: 2	**Internal Marks**	: 25
		External Marks	**:** 75

Course Objectives:

- To enable the students to understand the important mathematical concepts.
- To make them understand the numerical concepts and quantitative aptitude
- To enable the students to acquire the knowledge of logical reasoning.
- To make them understand Number series, Alphabetic Series, Diagrammatic Series and Number Ranking
- To enrich their knowledge on Puzzle, Venn diagram and Verbal Reasoning

UNIT I

Theory of numbers, Review of fundamental operations, Decimal Fractions, exponentiation, Prime numbers, Factorisation, Arithmetic mean, Geometric mean[1] - LCM, HCF, Unit and dimension, complex numbers, separation into real and imaginary parts[5]

UNIT II

Average – Problems on Ages[11] – Ratio & Proportion – Percentages -Profit & Loss - Simple Interest – Compound Interest - Partnership

UNIT III

Time & Work - Problems on Trains[3] – Boats & Streams - Permutations & Combinations - Time and Distance[7] - Data Interpretation

UNIT IV

Number Series – Alphabetic Series – Diagrammatic Series[3] - Blood Relation[7] – Test of Direction Sense – Coding and Decoding

UNIT V

Number Ranking or Ordering[8] – Grouping Identical Figures[4] - Cubes and Dice - Embedded Figures - Venn diagram

UNIT VI

Mathematics is the basic instruments for promotions of knowledge, reasoning, logical development and individual development[11] - Seminar. Logical reasoning is necessary for the cognitive development[5] - discussions

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[4]E-mind Map
[5]Flipped Learning
[7]Inquisitive Learning
[8]JIGSAW
[11]Reflective Learning

Materials for Study & Reference:

Text Books:

1. Dr. R.S. AGGARWAL, Verbal and Non Verbal Reasoning (Revised Edition), S. Chand Publications, 2010

2. Dr. R.S. AGGARWAL, Verbal and Non Verbal Reasoning (Revised Edition), S. Chand Publications, 2010

E-Books:

- http://www.freebookcentre.net/SpecialCat/Free-Mathematics-Books-Download.html
- https://www.e-booksdirectory.com/mathematics.php? gclid=Cj0KCQjwlv_ XBRDrARIsAH-iRJRmoqA6DS73tU2Jkp9MiuTFRpZmTuPGcWQ04uJedMxpr 7Ej8O-HSpgaApaOEALw_wcB
- http://mbacatmaterial.blogspot.in/p/ebooks.html
- http://www.knowledgephilic.in/arun-sharma-logical-reasoning-full-e-book/

Course Outcomes:

On completion of the course the students will be able to:

➢

CO1	**K1**	Calculate arithmetic mean and Geometric mean
CO2	**K1 K2**	Understand the numerical concepts
CO3	**K2 K3**	Calculate profit and Loss, simple interest and compound interest
CO4	**K3 K4**	Understand time, work, permutations and combinations
CO5	**K5 K6**	Categorize logical questions related to arrangements

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓		✓			✓	✓			
CO2		✓				✓	✓	✓		
CO3		✓	✓				✓		✓	
CO4			✓	✓	✓		✓			✓
CO5				✓	✓			✓		✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-IV: Non-Major Elective Course - II
ADVANCED ACCOUNTING PACKAGE LAB

Course Code : 23UCANMEC02 **Max. Marks : 100**
Credits : 2 **Internal Marks : 40**
External Marks : 60

Objectives:

- To help the students to have practical experience in handling accounting packages
- To make them to understand the Configuration of Tally
- To equip them with the knowledge of trial balance and balance sheet.

Exercises: [1, 3, 5]

1. Architecture and customization of Tally
2. Configuration of Tally
3. Tally Screens and Menus
4. Creation of new company
5. Group Creation
6. Preparation of voucher entries
    a. Payment voucher
    b. Receipt voucher
    c. Sales voucher
    d. Purchase voucher
    e. Contra voucher
    f. Journal voucher
7. Ledger Creation
8. Preparation of Trail balance
9. Preparation of Profit and loss statement.
10. Preparation of Balance Sheet
11. Creation of inventory reports
    a. Stock groups
    b. Stock items
    c. Unit measurement
    d. single and multiple Godown
12. Order Processing
    a. Purchase order
    b. Sales order
    c. Receipt note
    d. Delivery note
    e. Rejection in
    f. Rejection out
    g. Debt note
    h. Credit note (invoice format)
13. Bank Reconciliation Statement
14. Interest Calculation
    a. Simple
    b. Compound interest
15. GST (Goods and Services Tax) Calculation

Pedagogical method used:

[1]Blended Learning

[3]Constructivist Learning

[5]Exploratory Learning

[7]Inquisitive Learning

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1**	Understand the Configuration of Tally
CO2	**K3**	Create a Company profile with Tally, Ledger and Voucher entry
CO3	**K2**	Calculate a Trail Balance, Balance sheet
CO4	**K4K5**	Prepare Profit and loss statement, GST and Bank Reconciliation Statement
CO5	**K3K5**	Create Inventory Reports and Evaluate Order Processing

Mapping with Program Outcomes

CO/ PO&PSO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓					✓	✓			
CO2		✓	✓					✓		
CO3		✓		✓		✓	✓			
CO4				✓	✓			✓	✓	
CO5					✓		✓			✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-V: Core Course - V
OPERATING SYSTEMS

Course Code	: **23UCACC05**	**Max.Marks**	:100
Credits	: 4	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To impart fundamental knowledge about operating systems to the students.
- To make them to understand functions of operating system.
- To equip the students with the knowledge on concepts of memory management.

UNIT I

Introduction - Operating Systems definition - Types of operating systems - Operating Systems structure - Operating Systems operations - Operating Systems services - System Calls[1,2] - Types of System calls-Operating System Design and Implementation –Virtual Machine.

UNIT II

Process Management - process scheduling- operations on processes- Scheduling criteria-scheduling algorithm – Thread scheduling[3] - Multi processor scheduling-Inter process communication

UNIT III

Process Synchronization- The critical section problem- Semaphores-Monitors-Deadlock – Methods of handling deadlocks[5] - Deadlock prevention, deadlock avoidance, deadlock detection and deadlock recovery.

UNIT IV

Real Memory organization and Management: Memory organization, Memory management, Memory hierarchy, Memory management strategies, contiguous vs non-contiguous memory allocation, single user contiguous memory allocation, fixed partition multi programming, variable partition multi programming, Memory swapping[7].

UNIT V

Virtual Memory organization: virtual memory basic concepts, paging basic concepts, segmentation. Virtual Memory Management: Demand Paging, Page replacement strategies
File Management - Disk Scheduling[6].

UNIT VI

Discuss the importance of Operating Systems: Seminar & Discussion

Pedagogical method used:

[1]Blended Learning
[2]Brain Storming
[3]Constructivist Learning
[5]Exploratory Learning
[6]Flipped Learning
[7]Inquisitive Learning

TEXT BOOK(S):

1. Silberschatz, Galvin, Gagne - Operating System Concepts - John Willey & Sons – 2009 (8th Edition).

REFERENCE(S):

1. William Stallings - Operating Systems, Internals and Design Principles- PHI Publications New Delhi -7th Edition .
2. Andrew Tanenbaum - Modern Operating Systems - Prentice Hall – 2009 (3rd edition).

E-Books:

- http://www.allitebooks.in/operating-system-concepts/
- https://www.getfreeebooks.com/category/operating-systems/
- https://sites.google.com/site/uopops/ebooks

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1 K2**	To improve the knowledge in Operating Systems and their process concepts.
CO2	**K1 K2**	Provides complete information about Thread concepts and execution Procedures and problems.
CO3	**K3 K4 K5**	Explains about deadlock Concepts and gives a clear cut idea on different Process scheduling.
CO4	**K1 K4**	Exploring about memory management concepts and virtual memory.
CO5	**K2 K4**	Understanding about File and Database Systems.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓	✓		✓	
CO2	✓	✓				✓	✓	✓	✓	
CO3				✓	✓		✓	✓		✓
CO4			✓	✓		✓			✓	
CO5				✓			✓	✓		✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-V: Core Course: VI
SOFTWARE ENGINEERING

Course Code	: **23UCACC06**	**Max. Marks**	:100
Credits	: 4	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- Gain basic knowledge of analysis and design of systems
- Ability to apply software engineering principles and techniques
- Ability to design an effective model of the system
- Perform Testing at various levels and produce an efficient system.

UNIT-I:

Introduction: The software engineering discipline, programs vs. software products, Software Life Cycle Models: Why use a life cycle model, Classical waterfall model, iterative waterfall model, prototyping model, evolutionary model, spiral model, comparison of different life cycle models..

UNIT-II:

Requirements Analysis and Specification: Requirements gathering and analysis, Software requirements specification (SRS) Software Design: Good software design, cohesion and coupling, neat arrangement, software design approaches, object-oriented vs function-oriented design [3,4].

UNIT-III:

Software Design: Fundamental Design Concepts – Modules and Modularization Criteria – Design Notations – Design Techniques – Detailed Design Considerations – Real Time and Distributed Systems – Test Plans – Milestones, Walkthroughs and Inspections – Design Guidelines[5].

UNIT-IV:

Coding and Testing: Coding; code review; testing; testing in the large vs testing in the small; unit testing; black-box testing; white-box testing; debugging; program analysis tools; integration testing; system testing; some general issues associated with testing[7]. Software Reliability and Quality Management

UNIT-V:

Computer Aided Software Engineering: CASE and its scope; CASE environment; CASE support in software life cycle; Software Maintenance: Characteristic of software maintenance; software reverse engineering; software maintenance process models; estimation of maintenance cost;

UNIT VI:

Current status of software engineering in business environment: discussions[8]

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[4]E-mind Map
[5]Exploratory Learning
[7]Inquisitive Learning
[8]JIGSAW

Materials for Study & Reference:

Text Books:

1. Rajib Mall, Fundamentals of Software Engineering, Fifth Edition, Prentice – Hall of India, 2018

Reference Books:

1. Sommervile, 2001, software Engineering, 6th Edition , Addition Wesley Boston.
2. R.S.Pressman, 2010, Software Engineering A Practitioner's approach, 7th Edition, Tata Mcgraw –Hill, New Delhi.

E-Books:

- http://www.e-booksdirectory.com/listing.php?category=25

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1 K2**	Understanding the basic concepts of Software Engineering and various process models.
CO2	**K1 K2 K3**	Able to understand about the principles in software engineering and requirements.
CO3	**K1 K3 K4**	Understanding clearly about the software design and design guidelines
CO4	**K3 K4**	Understanding the concept of testing and quality management.
CO5	**K3 K4 K5**	To easy recognize of CASE and find the way for maintain the software.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓	✓			
CO2		✓	✓				✓		✓	
CO3			✓	✓		✓		✓	✓	
CO4				✓		✓			✓	✓
CO5			✓		✓	✓		✓	✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-V: Core Practical - V
ASP.NET PROGRAMMING LAB

Course Code : **23UCALC05** **Max. Marks** : 100
Credits : 4 **Internal Marks** : 40
External Marks : 60

Course Objectives:

- To develop ASP.NET Web application using standard controls.
- To create rich data base applications using ADO.NET.
- To implement file handling operations.
- To implement XML classes.
- To utilize ASP.NET security features for authenticating the website

LAB EXERCISES [1,3,5,6]:

1. Create an exposure of Web applications and tools
2. Implement the Html Controls
3. Implement the Server Controls
4. Web application using Web controls.
5. Web Page design using List & Rich controls.
6. Validate user input using Validation controls.
7. Web application using Data Controls.
8. Database application - form insert, update and delete operations Data Controls

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[5]Exploratory Learning
[6]Flipped Learning

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

CO1	**K1 K2**	Perform a simple application program
CO2	**K2 K4**	Implement HTML and Sever controls
CO3	**K3**	Develop an application using Web controls
CO4	**K4 K5**	Develop an application using Validation and Data Controls
CO5	**K3 K4 K5**	To understand and developing an application using ADO.NET

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓		✓		
CO2		✓		✓			✓			
CO3			✓			✓				
CO4				✓	✓	✓		✓	✓	✓
CO5			✓		✓		✓	✓	✓	

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-V: Elective Course - V
HUMAN COMPUTER INTERACTION

Course Code	: **23UCAEC05A**	**Max. Marks**	:100
Credits	: 3	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To learn about the foundations of Human Computer Interaction.
- To learn the design and software process technologies.
- To learn HCI models and theories.
- To learn Mobile Ecosystem.
- To learn the various types of Web Interface Design.

UNIT I

Foundations of HCI: The Human: I/O channels – Memory – Reasoning and problem solving; The Computer: Devices – Memory[1] – processing and networks; Interaction: Models – frame works – Ergonomics – styles – elements – interactivity - Paradigms.

UNIT II

Design & Software process: Interactive Design[5]: Basics – process – scenarios - Navigation: screen design Iteration and prototyping. HCI in software process: Software life cycle – usability engineering – Prototyping in practice – design rationale. Design rules: principles, standards, guidelines, rules. Evaluation Techniques – Universal Design.

UNIT III

Models and theories: HCI Models[7]: Cognitive models – Socio - Organizational issues and stake holder requirements – Communication and collaboration models - Hypertext, Multimedia and WWW.

UNIT IV

Mobile HCI: Mobile Ecosystem[2]: Platforms, Application frameworks – Types of Mobile Applications: Widgets, Applications, Games – Mobile Information Architecture, Mobile2.0 Mobile Design: Elements of Mobile Design, Tools.

UNIT V

Web Interface Design[7]: Designing Web Interfaces – Drag & Drop, Direct Selection, Contextual Tools, Overlays, Inlays and Virtual Pages, Process Flow.

UNIT VI

Discuss the importance of HCI models and theories: Seminar & Discussion

Pedagogical method used:

[1]Blended Learning
[2]Brain Storming
[5]Exploratory Learning
[6]Flipped Learning
[7]Inquisitive Learning

Text Books:

1. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, Human-Computer Interaction , III Edition, Pearson Education, 2004.

References:

1. Shneiderman, Designing the User Interface: Strategies for Effective Human-Computer Interaction, V Edition, Pearson Education.

E-Books:

- https://www.interaction-design.org/literature/topics/human-computer-interaction
- https://link.springer.com/10.1007/978-0-387-39925-9_192

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1 K2**	Understand the design and software process technologies.
CO2	**K2 K4**	Understand HCI models and theories.
CO3	**K3**	Understand Mobile Ecosystem, types of Mobile Applications, mobile Architecture and design.
CO4	**K4 K5**	Understand the various types of Web Interface Design.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓		✓		
CO2			✓	✓			✓		✓	
CO3			✓			✓				
CO4				✓	✓			✓		✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-V: Elective Course - VI
CLOUD COMPUTING

Course Code	: **23UCAEC06A**	**Max. Marks**	:100
Credits	: 3	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- Learning fundamental concepts and Technologies of Cloud Computing.
- Learning various cloud service types and their uses and pitfalls.
- To learn about Cloud Architecture and Application design.
- To know the various aspects of application design, bench marking and security of the Cloud.
- To learn the various Case Studies in Cloud Computing..

Unit 1:

Introduction to Cloud Computing: Definition of Cloud Computing –Characteristics of Cloud Computing – Cloud Models[1] – Cloud Service Examples–Cloud-based Services and Applications.

Unit-2:

Cloud Concepts and Technologies: Virtualization[3] – Load balancing –Scalability and Elasticity – Deployment – Replication – Monitoring –Software Defined Networking– Network Function Virtualization– Map Reduce – Identity and Access Management–Service Level Agreements – Billing.

Unit 3:

Cloud Services: Compute Services – Storage Services - Database Services - Application Services – Content Delivery Services - Analytics Services – Deployment and Management Services – Identity and Access Management Services.

Unit-4:

Cloud Application Design: Introduction – Design Consideration for Cloud Applications– Scalability – Reliability and Availability[4] – Security – Maintenance and Upgradation – Performance – Reference Architectures for Cloud Applications.

Unit-5:

Cloud Security[10]: Introduction – CSA Cloud Security Architecture –Authentication (SSO)– Authorization–Identity and Access Management – Data Security: Securing data at rest, securing data in motion –Key Management–Auditing.

Unit-6:

Discuss the importance of cloud applications: Seminar & Discussion

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[4]E-mind Map
[10]Participative Learning

Recommended Texts:

1. Arsh deep Bahga, Vijay Madisetti, Cloud Computing–A Hands On Approach, Universities Press(India) Pvt.Ltd.,2018

Reference Books:

1. Anthony T Velte, Toby J Velte, Robert Elsen peter, Cloud Computing: A Practical Approach, Tata Mc Graw-Hill, 2013.
2. Barrie S osinsky, Cloud Computing Bible, Wiley India Pvt. Ltd., 2013.

E-Books:

- https://en.wikipedia.org/wiki/Cloud_computing
- https://link.springer.com/chapter/10.1007/978-3-030-34957-8_7
- https://webobjects.cdw.com/webobjects/media/pdf/solutions/cloud-computing/121838-CDW-Cloud-Computing-Reference-Guide.pdf

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1**	Understand fundamental concepts and models of cloud.
CO2	**K2**	Outline the cloud enabling technology.
CO3	**K2**	Illustrate the cloud computing architecture and its services.
CO4	**K2**	Identify the cloud applications, maintenance and up gradation.
CO5	**K3**	Learn cloud security and auditing.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1		✓				✓	✓	✓		
CO2	✓					✓		✓	✓	
CO3		✓	✓				✓	✓		
CO4				✓		✓	✓			✓
CO5			✓		✓	✓		✓	✓	

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-V: Core Practical - VI
INTERNSHIP

Course Code	: **23UCAI**	**Max.Marks**	: 100
Credits	: 2	**Internal Marks**	: 40
		External Marks	: 60

Course Objectives:

- Develop new technical skills with respect to industry standards.
- Ability to acquire, evaluates, organize and maintain information.
- Improving problem-solving and critical thinking skills.
- Learn to manage time and other resources effectively.
- Develop appropriate workplace attitudes, behaving ethically and professionally.
- Demonstrate Effective utilization of new software tools to complete asks.

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
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Bachelor of Computer Applications
Semester-V
SOFT SKILL DEVELOPMENT

Course Code	: **23UCASK01**	**Max. Marks**	:100
Credits	: 2	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To help the students to understand self and others.
- To enable them to understand communication skills and corporate skills.
- To make them to understand about job hunting.

UNIT I

Know Thyself/ Understanding Self

Introduction to Soft skills[1] - Self discovery - Developing positive attitude-Improving perceptions-Forming values

UNIT II

Interpersonal Skills/ Understanding Others

Developing interpersonal relationship[10]-Team building-group dynamics-Net working - Improved work relationship

UNIT III

Communication Skills / Communication with others

Art of listening- Presentation – Debate[11] - Group Discussion - - Interviews Art of reading-Art of speaking-Art of writing-Art of writing e-mails-e-mail etiquette

UNIT IV

Corporate Skills / Working with Others

Developing body language-Practicing etiquette and mannerism[12]-Time management Stress Management

UNIT V

Selling Self / Job Hunting

Writing resume/CV- Preparing presentations for new products[2] - Preparing minutes of meeting - Letters to press, officials - Goal setting - Career planning

UNIT VI

The importance of soft skills in appearing interviews and placement in the competitive world: discussions and role play[12]

Pedagogical method used:

[1]Blended Learning
[2]Brain Storming
[10]Participative Learning
[11]Reflective Learning
[12]Scenario Analysis Based Learning

Materials for Study & Reference:

Text Books:

1. Meena.K and V.Ayothi (2013) A Book on Development of Soft Skills (Soft Skills : A Road Map to Success), P.R. Publishers & Distributors, No, B-20 & 21, V.M.M. Complex, Chatiram Bus Stand, Tiruchirappalli- 620 002.
2. Alex K. (2012) Soft Skills – Know Yourself & Know the World, S.Chand & Company LTD, Ram Nagar, New Delhi- 110 055.

Reference Books:

1. Developing the leader within you John c Maxwell
2. Good to Great by Jim Collins
3. The seven habits of highly effective people Stephen Covey
4. Emotional Intelligence Daniel Goleman
5. You can win Shive Khera
6. Principle centred leadership Stephen Covey

E-Books:

- https://www.pdfdrive.net/soft-skills-books.html

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1**	Understand Resilience and Leadership
CO2	**K3**	Work with others to achieve a set task
CO3	**K2K3**	Develop interpersonal relationship
CO4	**K4**	Improve body language, Confidence and enthusiasm for learning
CO5	**K3K5**	Understand Communication, Citizenship

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓					✓	✓			
CO2			✓					✓	✓	
CO3		✓	✓				✓	✓		
CO4			✓	✓				✓		✓
CO5				✓	✓	✓	✓		✓	

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
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Bachelor of Computer Applications
Semester-VI: Core Course - VII
COMPUTER NETWORKS

Course Code	: **23UCACC08**	**Max. Marks**	: 100
Credits	: 4	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To make the students to understand the basic concepts of computer Network
- To help them to learn Signals and conversions
- To enrich them with the concepts of Protocols and switching
- To equip them with the knowledge on Internet communication technology and its protocols

UNIT-I
Introduction: Components of data communication, Networks, standards and organizations, Network Classification, Network Topologies[1], The OSI model, TCP/IP Protocol Suite.

UNIT- II
Physical Layer Signals: Analog and Digital - Analog Signals - Digital Signals - Transmission Media – Unguided Media & Guided Media[2].

UNIT- III
Data Link Layer: Introduction, Error Detection and Correction -Block coding, Framing, Flow and Error Control, HDLC[3], Point to Point Protocol, Bluetooth.

UNIT-IV:
Network Layer: Switching – Circuit Switching, Packet Switching and Message Switching - Networking and Internetworking Devices – Repeaters – Bridges – Routers – Gateways - Routing Algorithm[4] – Distance Vector Routing and Link State Routing

UNIT-V:
Transport Layer – Services – Connection Management - Addressing, Establishing and Releasing a Connection – Simple Transport Protocol–Internet Transport Protocols (ITP) – Network Security: Cryptography.

UNIT VI
The importance of Computer Network: seminar – discussions

Pedagogical method used:
[1]Blended Learning
[2]Brain Storming
[3]Constructivist Learning
[4]E-mind Map
[9]Mobile Learning

Text Books:

1. W. Stalling, Data & Computer Communication - Prentice Hall of India, 2006 (8th edition)

References:

1. Godbole Achyut S., "Data Communication and Networks", Tata McGraw HillPublishing Limited, New Delhi, 2002.
2. Mansfield Kenneth C., Antonakos James L., "An Introduction to Computer Networking",Prentice Hall of India, New Delhi, 2002

E-Books:

- http://pdf1000.blogspot.in/2013/08/ebook-pdf-download-data-communication.html
- http://www.faadooengineers.com/threads/3371-Data-communication-and-networking-Ebook-PDF-DCN-Ebook

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1 K2 K3**	Able to differentiate between business and home applications, connection and connectionless services.
CO2	**K1 K2**	Provides complete information about the physical layer and their areas of application.
CO3	**K2 K3 K4**	Understanding data link layer and their functions in message delivering applications.
CO4	**K1 K3 K4**	Exploring different network layer functions along with the algorithms to select the best one for communication.
CO5	**K4 K5**	To create a clear cut idea on transport, network security and application layers.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1		✓				✓		✓		
CO2		✓				✓			✓	
CO3	✓		✓				✓	✓		
CO4			✓	✓		✓			✓	✓
CO5				✓	✓		✓		✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
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Bachelor of Computer Applications
Semester-VI: Core Course - VIII
DATA ANALYTICS USING R PROGRAMMING

Course Code	: **23UCACC09**	**Max. Marks**	: 100
Credits	: 4	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To understand the problem solving approaches
- To learn the basic programming constructs in R Programming
- To learn the basic programming constructs in R Programming
- To use R Programming data structures - lists, tuples, and dictionaries.
- To do input/output with files in R Programming.

UNIT-I

Evolution of Big data — Best Practices for Big data Analytics — Big data characteristics — Validating —The Promotion of the Value of Big Data[1] — Big Data Use Cases- Characteristics of Big Data Applications —Perception and Quantification of Value – Understanding Big Data Storage —A General Overview of High-Performance Architecture—HDFS— Map Reduce and YARN— Map Reduce Programming Model.

UNIT- II

CONTROL STRUCTURES AND VECTORS – Control structures, functions, scoping rules, dates and times, Introduction to Functions[2], preview of Some Important R Data Structures, Vectors, Character Strings, Matrices, Lists, Data Frames, Classes Vectors: Generating sequences, Vectors and subscripts, Extracting elements of a vector using subscripts, Working with logical subscripts, Scalars, Vectors, Arrays, and Matrices, Adding and Deleting Vector Elements, Obtaining the Length of a Vector, Matrices and Arrays as Vectors Vector Arithmetic and Logical Operations, Vector Indexing, Common Vector Operations.

UNIT- III

LISTS- Lists: Creating Lists, General List Operations, List Indexing Adding and Deleting List Elements[4], Getting the Size of a List, Extended Example: Text Concordance Accessing List Components and Values Applying Functions to Lists, Data Frames, Creating Data Frames, Accessing Data Frames, Other Matrix-Like Operations.

UNIT-IV:

FACTORS AND TABLES – Factors and Levels, Common Functions Used with Factors, Working with Tables, Matrix/Array[9] – Like Operations on Tables, Extracting a Sub table, Finding the Largest Cells in a Table, Math Functions, Calculating a Probability, Cumulative Sums and Products, Minima and Maxima, Calculus, Functions for Statistical Distributions R PROGRAMMING.

UNIT-V:

OBJECT – ORIENTED PROGRAMMINGS Classes, S Generic Functions, Writing S Classes, Using Inheritance[3], S Classes, Writing S Classes, Implementing a Generic Function on an S Class, visualization, Simulation, code profiling, Statistical Analysis with R, data manipulation.

UNIT VI

The importance of R programming: seminar – discussions

Pedagogical method used:

[1]Blended Learning
[2]Brain Storming
[3]Constructivist Learning
[4]E-mind Map
[9]Mobile Learning

Text Books:

1. Roger D.Peng, R Programming for Data Science, 2012

References:

1. Garrett Grolemund, Hadley Wickham, Hands-On Programming with R: Write Your Own Functions and Simulations, 1st Edition, 2014
2. Venables W.N., and Ripley, S programming, Springer, 2000.

E-Books:

- https://www.simplilearn.com

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1 K2**	Demonstrate the concepts of Big data and Map reducing model
CO2	**K1 K3**	Understand various control structures, arrays and vector
CO3	**K2 K4**	To know about how to create and manipulate list and data frame
CO4	**K2 K3 K4**	Implement the concept of factors and tables.
CO5	**K3 K4 K5**	Provides complete information about Object Oriented Programming

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓		✓		
CO2		✓	✓			✓	✓		✓	
CO3			✓	✓			✓	✓	✓	
CO4			✓	✓			✓		✓	
CO5				✓	✓	✓		✓		✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
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Bachelor of Computer Applications
Semester-VI: Core Practical - VI
R PROGRAMMING LAB

Course Code : **23UCALC06** **Max. Marks** : 100
Credits : 4 **Internal Marks** : 40
External Marks : 60

Course Objectives:

- To understand how to solve the given problems
- To learn the basic concepts of control structure
- Able to implement string functions
- To implement various data structures like lists, tuples, and dictionaries.

LAB EXERCISES [1,3,5,6]:

1. Program to convert the given temperature from Fahrenheit to Celsius and vice-versa depending up on user‘s choice.
2. Program to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
3. Write a program to find list of even numbers from 1 to n using R-Loops.
4. Create a function to print squares of numbers in sequence.
5. Write a program to join columns and rows in a data frame using cbind() and rbind().
6. Implement different String Manipulation functions in R.
7. Implement different data structures in R (Vectors, Lists, Data Frames)
8. Write a program to read a csv file and analyze the data in the file in R

Pedagogical method used:

- [1]Blended Learning
- [3]Constructivist Learning
- [5]Exploratory Learning
- [6]Flipped Learning

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

CO1	**K1**	Develop the simple programs using input method based on user choice
CO2	**K3**	Perform various programs to demonstrate the concept of loops
CO3	**K4 K5**	Create different data structures - data frame , list and vector
CO4	**K4**	Implement string manipulation functions in R
CO5	**K4 K5**	Perform file handling - To create and manipulate a csv file

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓		✓		
CO2		✓	✓				✓		✓	
CO3				✓	✓		✓	✓		✓
CO4			✓	✓		✓			✓	
CO5			✓		✓	✓		✓	✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
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Bachelor of Computer Applications
Semester-VI: Elective Course VII
ANALYTICS FOR SERVICE INDUSTRY

Course Code	: **23UCAEC07A**	**Max. Marks**	: 100
Credits	: 3	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- Recognize challenges in dealing with data sets in service industry.
- Identify and apply appropriate algorithms for analyzing the healthcare, Human
- Resource, hospitality and tourism data.
- Make choices for a model for new machine learning tasks.
- To identify employees with high attrition risk.
- To prioritizing various talent management initiatives for your organization.

Unit I

Healthcare Analytics: Introduction to Healthcare Data Analytics-Electronic Health Records– Components of EHR- Coding Systems-Benefits of EHR- Barrier to Adopting HER Challenges- Pheno-typing Algorithms. Biomedical Image Analysis and Signal Analysis-Genomic Data Analysis for Personalized Medicine, Review of Clinical Prediction Models[1].

Unit II

Healthcare Analytics Applications : Applications and Practical Systems for Healthcare– Data Analytics for Pervasive Health- Fraud Detection in Healthcare- Data Analytics for Pharmaceutical Discoveries-Clinical Decision Support Systems-Computer-Assisted Medical Image Analysis Systems- Mobile Imaging and Analytics for Biomedical Data[3].

Unit III

HR Analytics: Evolution of HR Analytics, HR information systems and Data sources, HR Metric and HR Analytics, Evolution of HR Analytics; HR Metrics and HR Analytics; Intuition versus analytical thinking; HRMS/HRIS and data sources; Analytics frame works like LAMP,HCM:21 (r) Model[5].

Unit IV

Performance Analysis: Predicting employee performance, Training requirements, evaluating training and development, Optimizing selection and promotion decisions.

Unit V

Tourism and Hospitality Analytics[6]: Guest Analytics – Loyalty Analytics–Customer Satisfaction–Dynamic Pricing–optimized Disruption management–Fraud detection in payments.

Unit VI

Current Contours in service industry

Pedagogical method used:

- [1]Blended Learning
- [3]Constructivist Learning
- [5]Exploratory Learning
- [6]Flipped Learning

Text books

- Chandan K. Reddy and CharuC Aggarwal, ― Healthcare data analytics, Taylor & Francis,2015.
- Edwards Martin R, Edwards Kirsten(2016),―Predictive HR Analytics: Masteringthe
- HR Metric, Kogan Page Publishers, ISBN-0749473924
- Fitz-enzJac (2010),―Thene HR analytics: predicting the economic value of your company‘ shuman capital investments‖,AMACOM,ISBN-13:978-0-8144-1643-3

Reference Books

- Hui Yangand EvaK. Lee,―Healthcare Analytics: From Data to Knowledge to HealthcareImprovement,Wiley,2016
- Fitz- enzJac, MattoxII John(2014),―Predictive Analytics for Human Resources‖, Wiley, ISBN-1118940709.

Web Resources

- https:// www.ukessays.com /essays /marketing/ contemporary-issues-in-marketing-marketing - essay. php
- https://yourbusiness. azcentral.com /examples –contemporary - issues- marketing-field-26524. html

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1K2**	Understand and critically apply the concept sand methods of business analytics
CO2	**K3**	Identify, model and solve decision problems indifferent settings.
CO3	**K3 K4 K5**	Interpret results/solutions and identify appropriate courses of action for a given managerial situation.
CO4	**K3 K4**	Create viable solutions to decision making problems.
CO5	**K4 K5**	Instill a sense of ethical decision-making and a commitment to the long-run welfare of both organizations and the communities they serve.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓		✓		
CO2		✓	✓				✓		✓	
CO3				✓	✓		✓	✓		✓
CO4			✓	✓		✓			✓	
CO5			✓		✓	✓		✓	✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI

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Bachelor of Computer Applications

Semester-VI: Elective Course - VIII

IoT AND ITS APPLICATIONS LAB

Course Code	: **23UCAEC08A**	**Max. Marks**	:100
Credits	: 3	**Internal Marks**	: 40
		External Marks	: 60

Course Objectives:

- Use of Devices, Gateways Data Management in IoT.
- Design IoT applications and be able to analyze their performance
- Implement basic IoT applications on embedded platform
- To gain knowledge on Industry Internet of Things
- To Learn about the privacy and Security issues in IoT

LAB EXERCISES [1,3,5,6]:

1. Study the fundamentals of IoT software's and components.
2. Interface LED / Buzzer with Arduino and write a program to turn ON LED for 1 second after every 2 seconds.
3. Interface Digital Sensor (LDR) with Arduino and write a program to turn ON LED when at sensor detection.
4. Interfacing RGB LED (Traffic Signal) with Arduino.
5. Indicate the water level and turn ON / OFF the motor using probes and DC Motor.
6. Interface Servo Motor and IR Sensor with Arduino and write a program to open and close the door.
7. Display the Room Temperature using Arduino and LM35 Sensor.
8. Display the distance of the object using Ultrasonic sensor and Arduino.
9. Switch Light ON and OFF based on the input of user using Bluetooth.
10. Develop a Smart Home Application using necessary IoT components.

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[5]Exploratory Learning
[6]Flipped Learning

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1 K2**	Know about the evolution for mobile, home and embedded applications that Is connected to the internet, to integrate communication.
CO2	**K3**	Gather knowledge about how the devices share the data on the cloud and Analyze it in a secure manner on the network.
CO3	**K3 K4**	Know how the industries are adopting internet-of-things-solutions to Improve their existing systems.
CO4	**K5**	Get knowledge about how the things to be connected with various devices.
CO5	**K5 K6**	Get familiar about components and their functionalities.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓					✓	✓		
CO2		✓	✓			✓	✓			
CO3	✓		✓					✓	✓	
CO4				✓		✓			✓	
CO5				✓	✓		✓		✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
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Bachelor of Computer Applications
Semester-VI: Core Practical - VIII
PROJECT

Course Code : **23UCACP01** **Max. Marks** :100
Credits : 4 **Internal Marks** : 40
External Marks : 60

Objectives

The objective of the project is to help the student develop the ability to apply theoretical and practical tools / techniques to solve real life problems related to industry, academic institutions and research laboratories. After completion of this project work, the student should be able to describe the Systems Development Life Cycle (SDLC) related to their project.

All the candidates of BCA are required to execute a Project and submit its Project-Report. These projects are to be carried out on real life problems.

PROJECT WORK PATTERN

FIRST REVIEW:

1. Project Title
2. Project Platform (Language/Package Selected)
3. Details of Guide with Designation & Qualification.
4. Presentation

SECONDREVIEW:

1. Work Observation
2. Modules in Project (Design Screens Sample)
3. DFD/ERD/System Flow Diagram (Whichever Applicable)
4. PowerPoint Presentation.

FINALREVIEW:

1. Documentation
2. Screens Shots
3. DFD/ERD/System Flow Diagram(Whichever Applicable)
4. Final Project Report (with executable format including complete source code)

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

CO1	**K1**	Designing an application for the given problem.
CO2	**K1 K2**	Writing coding for the designed application.
CO3	**K1 K2 K3**	Acquiring knowledge in industry level developing skills.
CO4	**K1 K2**	Getting familiar with project platform.
CO5	**K1 K4 K5**	Developing skills in Documentation and Presentation skills.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓		✓	✓	
CO2			✓	✓		✓	✓		✓	
CO3			✓	✓			✓	✓		
CO4					✓	✓		✓		
CO5				✓	✓	✓			✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI

Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-VI: Skill Enhancement Course – VIII
SOFTWARE TESTING LAB

Course Code : **23UCASEC08** **Max. Marks** : 100
Credits : 2 **Internal Marks** : 40
External Marks **:** 60

Course Objectives:

- To discuss the distinctions between validation testing and defect testing.
- To describe the principles of system and component testing .
- To describe strategies for generating system test cases.
- To understand the essential characteristics of tool used for test automation.

Exercises: [1,3,5,7]

1. Using Selenium IDE, Write a test suite containing minimum 4 test cases.
2. Understanding Test Automation. Using Selenium write a simple test script to validate each field of the registration page (Eg: Facebook Registration Page)
3. Write and test a program to login a specific web page.
4. Write test cases to validate a mobile number using one time pin identification(OTP)
5. Write and Test a program to find out list of employees having salary greater than Rs 50,000 and age between 30 to 25 years.
6. Write and test a program to update 10 student records into table into Excel file.
7. Write and test a program to select the number of students who have scored more than 75 in any one subject (or all subjects).
8. Write and test a program to get the number of list items in a list / combo box.
9. Write the test cases for any known application (e.g. Banking application)
10. Create a test plan document for any application (e.g. Library Management System)

Pedagogical method used:

- [1]Blended Learning
- [3]Constructivist Learning
- [5]Exploratory Learning
- [7]Inquisitive Learning

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

CO1	**K1 K2**	Understanding the basic concepts of Software Testing Strategies.
CO2	**K1 K2 K3**	To know about the Tools used for testing and should not be confused with Automation products.
CO3	**K1 K2 K3 K4**	Able to understand about code review and desk debugging techniques that Reduce the burden on dynamic code testing.
CO4	**K3 K4 K5**	Understanding clearly about the new methodologies and processes are Emerging to improve software quality.
CO5	**K1 K2**	Understanding the basic concepts of Software Testing Strategies.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓			✓	
CO2		✓	✓				✓	✓		
CO3			✓	✓			✓		✓	
CO4				✓	✓	✓	✓			✓
CO5			✓	✓		✓		✓		

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
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Bachelor of Computer Applications
Semester-VI
GENDER STUDIES

Course Code : **23UCAGS01** **Max. Marks** :100
Credits : 1 **Internal Marks** : 25
External Marks : 75

Course Objectives:

- To make the students aware of each other's strengths and weakness.
- To help them to develop sensitivity towards both genders in order to lead an ethically enriched life.
- To make them to promote attitudinal change towards a gender balanced ambience and women empowerment.

UNIT I

Concepts of Gender[1]: Sex – Gender – Biological Determinism – Patriarchy – Feminism – Gender Discrimination – Gender Division of labour – Gender Stereotyping – Gender Sensitivity – Gender Equity – Equality – Gender Mainstreaming - Empowerment.

UNIT II

Women's Studies vs Gender Studies: UGC's Guidelines – VII to XI Plans[9] – Gender Studies: Beijing Conference and CEDAW – Exclusiveness and Inclusiveness.

UNIT III

Areas of Gender Discrimination[2] : Family – Sex Ratio – Literacy – Health – Governance – Religion Work Vs Employment – Market – Media – Politics – Law – Domestic Violence – Sexual Harassment – State Policies and Planning .

UNIT IV

Women Development and Gender Empowerment [10]: Initiatives – International Women's Decade – International Women's Year – National Policy for Empowerment of Women – Women Empowerment Year 2001 – Mainstreaming Global Policies.

UNIT V

Women's Movements and Safeguarding Mechanism : In India National /State Commission for Women(NCW) – All Women Police Station – Family Court – Domestic Violence Act – Prevention of Sexual Harassment at Work Place Supreme Court Guidelines[11] – Maternity Benefit Act – PNDT Act – Hindu Succession Act 2005 – Eve Teasing Prevention Act – Self Help Groups – 73rd and 74th Amendment for PRIS

UNIT VI

The present status of gender equality in the society: discussions[12]

Pedagogical method used:

[1]Blended Learning
[2]Brain Storming
[9]Mobile Learning
[10]Participative Learning
[11]Reflective Learning
[12]Scenario Analysis Based Learning

References:

1. Bhasin Kamala, Understanding Gender : Gender Basics , New Delhi : Women Unlimited , 2004
2. Bhasin Kamala, Exploring Masculinity: Gender Basics , New Delhi: Women Unlimited, ,2004
3. Bhasin Kamala , What is Patriarchy? : Gender Basics, New Delhi :Women Unlimited ,1993
4. Pernau Margrit, Ahmad Imtiaz, Reifeld Hermut (ed.,)Family and Gender : Changing Values in Germany and India ,New Delhi :Sage Publications,2003
5. Agarwal Bina, Humphries Jane and Robeyns Ingrid(ed.,) Capabilities , Freedom , and Equality: Amartya Sen's Work from a Gender Perspective,New Delhi : Oxford University Press ,2006
6. Rajadurai. S.V,Geetha.V,Themes in Caste Gender and Religion, Tiruchirappalli : Bharathidasan University ,2007

E-Books:

http://www.cssforum.com.pk/css-optional-subjects/group-v/gender-studies/103522-30-gender-studies-books-download-links.html

http://libraryguides.helsinki.fi/genderstudies/

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1**	Understand the concept of gender
CO2	**K3**	Aware of Gender Discrimination
CO3	**K2**	Acquire knowledge on Women Development
CO4	**K4**	Understand Gender Empowerment, Domestic Violence Act
CO5	**K3K5**	Identify Women's Movements , Visualize Supreme Court Guidelines for Prevention of Sexual Harassment at Work Place

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓	✓			✓
CO2			✓					✓	✓	
CO3		✓	✓				✓	✓		
CO4			✓	✓				✓		✓
CO5					✓	✓	✓			

Optional Elective Papers

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-I: Elective Course - I
OPTIMIZATION TECHNIQUES

Course Code	: **23UCAEC01B**	**Max. Marks**	: 100
Credits	: 3	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To introduce the students the fundamental concepts of Optimization Techniques.
- To make the students to acquire the knowledge on Transportation problem, Sequencing Problems, Replacement Problems.

UNIT I:
Introduction to Operations Research – Mathematical Formulation of the problem – Graphical Solution Method – Simplex method [1,2]

Unit II
Transportation problem – North West corner rule – Least cost method – Vogel's approximation Method – Assignment problems [4]

Unit III
Sequencing Problems: Introduction – Problem of sequencing – Basic term used in sequencing – Processing n Jobs through 2 machines – Processing n Jobs through k machines

UNIT IV
Replacement Problems – Introduction – Replacement of Equipment / asset that Deteriorates Gradually – Replacement of Equipment that fails suddenly [5,11].

UNIT V
Network scheduling by PERT/CPM – Introduction – Network and basic components – Rules of network construction – Critical path analysis – Probability consideration in PERT – Distinction between PERT and CPM .

UNIT VI
The relationship of Optimization Techniques in day-to-day applications in human life[11]

Pedagogical method used:
[1]Blended Learning
[2]Brain Storming
[4]E-mind Map
[5]Exploratory Learning
[11]Reflective Learning

Materials for Study & Reference:
Text Book

1. KantiSwarup, P.K. Gupta and Man Mohan, Operations Research, Sultan Chand and Sons Publishers, New Delhi, Thirteenth Edition, Reprint 2008.

Books for References:

1. Sharma, S.D., "Operations Research", KedarNath Ram Nath & Co. (15th Edition), 2010.
2. Richard Bronson, Theory and Problems of Operations Research, Tata McGraw Hill Publishing Company Ltd., New Delhi, 1982.

Web Reference:

- https://nptel.ac.in/courses/111/107/111107128/

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1 K2**	Demonstrate and study of operations research and illustrate the examples of mathematical formulation
CO2	**K1 K2 K3**	Classification and study of Transportation problem and Assignment problems with examples
CO3	**K2 K3**	Analyse machine elapsed times with examples
CO4	**K4 K5**	Illustrate the Replacement Problems suitable examples.
CO5	**K3 K4**	Construct the networks and plan execution with examples.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓			✓	
CO2		✓					✓	✓		
CO3		✓	✓				✓		✓	
CO4				✓	✓		✓			✓
CO5			✓	✓				✓	✓	

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI

Centre for Differently Abled Persons

Bachelor of Computer Applications

Semester-II: Elective Course – II

NUMERICAL METHODS

Course Code	: **23UCAEC02B**	**Max. Marks**	: 100
Credits	: 3	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To introduce a broad range of numerical methods for solving mathematical problems
- To provide a basic understanding of the derivation, analysis, and use of numerical methods
- An understanding of finite precision arithmetic, conditioning, and stability of the various methods.

UNIT I

Solution of algebraic and transcendental equations[1]- Bisection method- Method of Successive Approximation or the Iteration method– Newton Raphson Method (This unit contains Problems only).

UNIT II

Solution of System of Linear Equations[2] – Gauss Elimination Method, Gauss Jordan Method, Gauss Jacobi Method– Gauss Seidel Method (This unit contains Problems only).

UNIT III

Measures of Central Tendency – Measures of Dispersion-Measures of skewness[4] (This unit contains Problems only).

UNIT IV

Finite Differences: Forward differences – Backward difference. Interpolation: Gregory-Newton forward interpolation formula for equal intervals[11] - *GregoryNewton backward interpolation formula for equal intervals* – Related Problems.

UNIT V

Numerical Integration: Trapezoidal Rule – Simpson's 1/3 rule[4] - *Simpson's 3/8 rule*.

Pedagogical method used:

[1]Blended Learning
[2]Brain Storming
[4]E-mind Map
[11]Reflective Learning

Materials for Study & Reference:

Text Book

1. Dr. P.Kandasamy, Dr.K.Thilagavathy, Dr.K.Gunavathi, Numerical Methods,S. Chand, First Edition 2008.
2. Applied Numerical Analysis by C. F. Gerald and P. O. Whitely; Pearson Education India; 7 ed.; 2007

Books for References:

1. S.S. Sastry, Introductory Methods of numerical analysis, Prentice Hall of India Pvt. Ltd., 2004.
2. Introduction to Applied Linear Algebra: Vectors, Matrices, and Least Squares by S. Boyd and L. Vandenberghe; Cambridge University Press; 1 ed.; 2018

Web Reference:

- https://nptel.ac.in/courses/111/107/111107105/

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

CO1	**K1 K2**	This course will help students to recall the distinctive principles of numerical analysis and the associated error measures.
CO2	**K1 K2 K3**	Apply numerical methods used to obtain approximate solutions to intractable mathematical problems such as interpolation, integration.
CO3	**K3 K4**	Select appropriate numerical methods to apply to various types of problems in consideration of the mathematical operations involved, accuracy requirements, and available computational resources.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1		✓	✓			✓			✓	
CO2	✓			✓			✓	✓		
CO3					✓				✓	✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI

Centre for Differently Abled Persons

Bachelor of Computer Applications

Semester-III: Elective Course - III

COST AND MANAGEMENT ACCOUNTING

Course Code	: **23UCAEC03B**	**Max. Marks**	: 100
Credits	: 3	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To understand Cost Accounting and Management Accounting and their importance.
- To make the apportionment and absorption of expenses by various bases of apportionment.
- To understand various methods of costing for different kinds of production means.
- To analyze the importance of budgeting and the impact on Cost Accounting.

UNIT I:

Introduction - Management Accounting - Definition - Objectives of Management Accounting - Role of Management Accounting in Management Process - Functions of Management Accounting - Significance of Management Accounting - Limitations of Management Accounting - Relationship between Management Accounting and Cost Accounting [1,2]

Unit II

Marginal Costing - Determination of Cost and Profit under Marginal Costing - Realities about Marginal Costing - Techniques of Marginal Costing - Differential Cost Analysis - Differences between Absorption Costing and Marginal Costing - Application of Marginal Costing in Decision Making - Transfer Pricing - Objectives of Inter Company Transfer Pricing - Methods of Transfer Pricing[4]

Unit III

Budgetary Control and Preparation of Functional and Master Budgeting - Fixed, Variable, Semi-variable Budgets - Zero Based Budgeting (ZBB)

UNIT IV

Computation of Variances for each of the Elements of Costs, Sales Variances - Investigation of Variances & Reporting of Variances - Valuation of Stock under Standard Costing - Uniform Costing and Inter-firm Comparison[5,11].

UNIT V

Phases in Learning Curve - Uses of Learning Curve - Limitations of the usefulness of the Learning Curve - Factors affecting Learning Curve - The Experience Curve - Reasons for use of Learning Curve - Application of Learning Curve .

UNIT VI

Application of cost accounting in our day-to-life: discussions[11]

Pedagogical method used:

[1]Blended Learning
[2]Brain Storming
[4]E-mind Map
[5]Exploratory Learning
[11]Reflective Learning

Materials for Study & Reference:

Text Book

1. Kanti Swarup, P.K. Gupta and Man Mohan, Sultan Chand and Sons Publishers, New Delhi, Thirteenth Edition, Reprint 2008.

Books for References:

1. Richard Bronson, Theory and Problems of Cost Accounting, Tata McGraw Hill Publishing Company Ltd., New Delhi, 1982.

Web Reference:

- https://nptel.ac.in/courses/111/107/111107128/

Course Outcomes:

On completing the course students will be able to:

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1 K2**	Understand and differentiate between Cost accounting and management accounting.
CO2	**K3**	Make managerial decisions regarding make or buy, acceptance or rejection of export offers and continuation or shut down of plant.
CO3	**K3**	Understand and apply the concepts of budgetary control for better decision-making.
CO4	**K4**	Understand and estimate material, labor, overheads and sales variances for comparing planned with actual results.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓			✓	
CO2		✓	✓				✓	✓		
CO3				✓				✓	✓	
CO4				✓	✓		✓			✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-IV: Elective Course - IV
DIGITAL LOGIC FUNDAMENTALS

Course Code	: **23UCAEC04B**	**Max. Marks**	:100
Credits	: 3	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To teach various number systems, binary codes and their applications
- To familiarize the students the importance of error detection and error correction codes.
- To inculcate concepts of K-MAP to simplify a Boolean expression
- To facilitate students in designing a logic circuit.

UNIT I:

Digital Systems and Binary Numbers: Digital systems, binary numbers, number base conversions[1], octal and hexadecimal numbers, complements, signed binary numbers, binary codes, error detection and error correction codes.

UNIT II:

Boolean Algebra and Logic Gates: Basic definitions, axiomatic definition of Boolean algebra[3], basic theorems and properties of Boolean algebra, Boolean functions, canonical and standard forms, other logic operations, digital logic gates.

UNIT III:

Gate Level Minimization: The k-map method, four-variable map, five-variable map, product of sums simplification, don't-care conditions, NAND and NOR implementation[7], determination and selection of Prime Implicants, Essential and Non-essential prime Implicants.

UNIT IV:

Combinational Circuits: Design procedure, Binary Adder, Binary Subtractor, Binary Multiplier[1], Magnitude Comparator, Decoders, Encoders, Multiplexers, and Demultiplexers.

UNIT V:

Registers, Counters and Memory: Registers, shift registers, ripple counters, ring counter, flip-flops[8], Random access memory, memory decoding, error detection and correction, read only memory, programmable logic array.

UNIT VI

The importance of digital logic circuits and its real time applications: Seminar and Discussions

Pedagogical method used:

[1]Blended Learning

[3]Constructivist Learning

[7]Inquisitive Learning

[8]JIGSAW

Materials for Study & Reference:

Text Books:

1. M. Morris Mano, Michael D. Ciletti (2008), Digital Design, 4th edition, Pearson Education Inc, India.

References:

1. Zvi. Kohavi (2004), Switching and Finite Automata Theory, Tata McGraw Hill, India.
2. C. V. S. Rao (2009), Switching and Logic Design, 3rd Edition, Pearson Education, India.
3. Donald D. Givone (2002), Digital Principles and Design, Tata McGraw Hill, India
4. Roth (2004), Fundamentals of Logic Design, 5th Edition, Thomson, India.

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1**	Use number systems and complements
CO2	**K2**	Identify the importance of canonical forms in the minimization or other optimization of Boolean formulas in general and digital circuits.
CO3	**K2 K3**	Minimize functions using any type of minimizing algorithms (Boolean algebra, Karnaugh map or Tabulation method)
CO4	**K4**	Analyze the design procedures of Combinational and Sequential circuits.
CO5	**K4 K5**	Design the finite state machine using algorithmic state machine charts and perform simple projects with a few flip-flops

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓				✓				
CO2		✓					✓	✓		
CO3			✓				✓		✓	
CO4				✓					✓	
CO5				✓	✓			✓		✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI

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Bachelor of Computer Applications

Semester-V: Elective Course - V

AGILE PROJECT MANAGEMENT

Course Code	: **23UCAEC05B**	**Max. Marks**	: 100
Credits	: 3	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- Learning of software design, software technologies and APIs.
- Detailed demonstration about Agile development and testing techniques.
- Learning about Agile Planning and Execution.
- Managing the Design and Quality Check of Agile.
- Detailed examination of Agile development and testing techniques.

UNIT I

Introduction: Modernizing Project Management: Project Management Needed a Makeover–Introducing Agile Project Management. Applying the Agile Manifesto and Principles: Understanding the Agile manifesto – Outlining the four values of the Agile manifesto –Defining the 15 Agile Principles – Adding the Platinum Principles –Changes as a result of Agile Values–The Agile litmus test. Why Being Agile Works Better: Evaluating Agile benefits – How Agile approaches beat historical approaches – Why people like being Agile[1,2].

UNIT II

Being Agile - Agile Approaches: Diving under the umbrella of Agile approaches – Reviewing the Big Three: Lean Scrum, Extreme Programming-Summary Agile Environments in Action: Creating the physical environment–Low-tech communicating–High-tech communicating–Choosing tools. Agile Behaviorism Action: Establishing Agile roles–Establishing new values–Changing team philosophy[4].

UNIT III

Agile Planning and Execution - Defining the Product Vision and Roadmap: Agile planning–Defining the product vision – Creating a product roadmap – Completing the product back log. Planning Releases and Sprints: Refining requirements and estimates – Release planning–Sprint planning. Working throughout the Day: Planning your day–Tracking progress– Agile roles in the sprint – Creating shippable functionality – The end of the day. Showcasing Work, Inspecting and Adapting: The sprint review – The sprint retrospective Preparing for Release: Preparing the product for deployment (the releases print)–Preparing the operational support– Preparing the organization for product deployment - Preparing the marketplace for product deployment[5].

UNIT IV

Agile Management- Managing Scope and Procurement: What‘s different about Agile scope management–Managing Agile scope–What‘s different about Agile procurement–Managing Agile procurement. Managing Time and Cost: What‘s different about Agile time management–Managing Agile schedules–What‘s different about Agile cost management–Managing Agile budgets. Managing Team Dynamics and Communication: What‘s different about Agile team dynamics– Managing Agile team dynamics–What‘s different about Agile communication–Managing Agile communication. Managing Quality and Risk: What‘s different about Agile quality–Managing Agile quality–What‘s different about Agile risk management–Managing Agile risk [11].

UNIT V

Implementing Agile-Building a Foundation: Organizational and individual commitment –Choosing the right pilot team members– Creating and environment that enables Agility–Support Agility initially and overtime. Being a Change Agent: Becoming Agile requires change–why change doesn‘t happen on its own – Platinum Edge‘s Change

Roadmap –Avoiding pitfalls–Signs your changes are slipping .Benefits, Factors for Success and Metrics: Ten key benefits of Agile project management – Ten key factors for project success – Ten metrics for Agile Organizations.

UNIT VI

Seminar on Agile project Management

Pedagogical method used:

[1]Blended Learning
[2]Brain Storming
[4]E-mind Map
[5]Exploratory Learning
[11]Reflective Learning

Textbook:

1. Mark C.Layton, Steven J.Oster miller, Agile Project Management for Dummies,2nd Edition, Wiley IndiaPvt.Ltd.,2018.
2. Jeff Sutherland, Scrum – The Art of Doing Twice the Work in Half the Time, Penguin,2014.

Reference Books

1. Mark C. Layton ,David Morrow, Scrum for Dummies, 2nd Edition, Wiley India Pvt. Ltd., 2018.
2. Mike Cohn, Succeeding with Agile–Software Development using Scrum, Addison-Wesley Signature Series, 2010.
3. Alex Moore, Agile ProjectManagement,2020.

Web Resources

- www.agilealliance.org/resources

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1**	Understanding of software design and APIs using Agile Management.
CO2	**K1 K2**	Understanding of Agile development and testing techniques.
CO3	**K2 K3**	Understanding about Agile Planning and Execution using Sprint.
CO4	**K3**	Understanding of Agile Management Design, scope, Procurement, managing Time and Cost and Quality Check.
CO5	**K4**	Analyzing of Agile development and testing techniques

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓					✓				
CO2	✓	✓					✓	✓		
CO3			✓				✓		✓	
CO4				✓					✓	
CO5				✓	✓					✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-V: Elective Course - VI
GRID COMPUTING

Course Code	: **23UCAEC06B**	**Max. Marks**	:100
Credits	: 3	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To learn the basic construction and application of Grid computing.
- To learn grid computing organization and their Role.
- To learn Grid Computing Anatomy.
- To learn Grid Computing roadmap.
- To learn various type of Grid Architecture.

Unit 1:
Introduction: Early Grid Activity, Current Grid Activity, Overview of Grid Business areas, Grid Applications, Grid Infrastructures[3].

Unit-2:
Grid Computing organization and their Roles: Organizations Developing Grid Standards, and Best Practice Guidelines, Global Grid Forum (GCF), Organization Developing Grid Computing Tool kits and Framework[4], Organization and building and using grid based solutions to solve computing, commercial organization building and Grid Based solutions.

Unit 3:
Grid Computing Anatomy[10]: The Grid Problem, The conceptual of virtual organizations, Grid Architecture and relationship to other distributed technology.

Unit-4:
The Grid Computing Road Map: Autonomic computing, Business on demand and infrastructure virtualization, Service-Oriented Architecture and Grid, Semantic Grid[1].

Unit-5:
Merging the Grid services Architecture with the Web Services Architecture: Service - Oriented Architecture, Web Service Architecture[1], XML messages and Enveloping, Service message description Mechanisms, Relationship between Web Services and Grid Services,
Web services Inter operability and the role of the WS-I Organization[10].

Unit-6:
Discuss the importance of Grid Computing applications: Seminar

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[4]E-mind Map
[10]Participative Learning

Text Books:

1. Joshy Joseph and Craig Fellenstein, Grid computing, Pearson / IBM Press, PTR, 2004.

Reference Books:

1. Ahmer Abbas and Graig computing, A Practical Guide to technology and applications, Charles River Media, 2003.

E-Books:

- https://en.wikipedia.org/wiki/Grid_computing
- https://link.springer.com/chapter/10.1007/978-1-84882-259-6_4
- https://www.redbooks.ibm.com/redbooks/pdfs/sg246778.pdf

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1**	Understand the basic elements and concepts of Grid computing.
CO2	**K2**	Understand the Grid computing tool kits and Framework.
CO3	**K2**	Understand the concepts of Anatomy of Grid Computing.
CO4	**K2K4**	Understand the concept to service oriented architecture.
CO5	**K3**	Gain knowledge on grid and web service architecture.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓					✓	✓			
CO2	✓						✓			
CO3		✓				✓			✓	
CO4		✓	✓		✓		✓			✓
CO5				✓		✓		✓		

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
Centre for Differently Abled Persons
Bachelor of Computer Applications
Semester-VI: Elective Course - VII
ARTIFICIAL INTELLIGENCE

Course Code	: **23UCAEC07B**	**Max. Marks**	:100
Credits	: 3	**Internal Marks**	: 25
		External Marks	: 75

Course Objectives:

- To learn various concepts of AI Techniques.
- To learn various Search Algorithm in AI.
- To learn probabilistic reasoning and models in AI.
- To learn about Markov Decision Process.
- To learn various type of Reinforcement learning.

UNIT-I:

Introduction: Concept of AI, history, current status, scope, agents, environments, Problem Formulations, Review of tree and graph structures, State space representation, Search graph and search tree.

UNIT-II:

Search Algorithms: Random search, Search with closed and open list, Depth first and Breadth first search, Heuristic search, Best first search, A* algorithm, Game Search.

UNIT-III:

Probabilistic Reasoning: Probability, conditional probability, Bayes Rule, Bayesian Networks - representation, construction and inference, temporal model, hidden Markov model.

UNIT-IV:

Markov Decision process: MDP formulation, utility theory, utility functions, value iteration, policy iteration and partially observable MDPs.

UNIT-V:

Reinforcement Learning: Passive reinforcement learning, direct utility estimation, adaptive dynamic programming, temporal difference learning, active reinforcement learning – Q learning.

UNIT VI:

Usage of Artificial Intelligence in COVID period: Case Study

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[4]E-mind Map
[5]Exploratory Learning
[7]Inquisitive Learning
[8]JIGSAW

Materials for Study & Reference:

Text Books:

1. Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach ,3rd Edition, Prentice Hall

Reference Books:

1. Trivedi, M.C., A Classical Approach to Artificial Intelligence, Khanna Publishing House, Delhi.
2. Saroj Kaushik, Artificial Intelligence, Cengage Learning India, 2011.

Web Resources:

- NPTEL & MOOC courses titled Artificial Intelligence and Expert Systems
- https://nptel.ac.in/courses/106106125/
- https://nptel.ac.in/courses/106106126/

Course Outcomes:

On completion of the course the students will be able to:

CO1	**K1**	Understand the various concepts of AI Techniques.
CO2	**K2**	Understand various Search Algorithms in AI
CO3	**K2**	Understand probabilistic reasoning and models in AI.
CO4	**K2**	Understand Markov Decision Process.
CO5	**K3K4**	Understand various type of Reinforcement learning Techniques.

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓				✓				
CO2		✓					✓			
CO3		✓				✓		✓		
CO4			✓				✓		✓	
CO5				✓	✓					✓

BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI
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Bachelor of Computer Applications
Semester-VI: Elective Course - VIII
IMAGE PROCESSING LAB

Course Code : **23UCAEC08B** **Max. Marks** :100
Credits : 3 **Internal Marks** : 40
External Marks : 60

Course Objectives:

- To learn fundamentals of digital image processing.
- To learn about various 2D Image transformations
- To learn about various image enhancement processing methods and filters
- To learn various classification of Image segmentation and compression techniques.

Exercises: [1,3,4,10]

1. Image sampling and quantization.
2. Analysis of intensity resolution of images.
3. Intensity transformation of images.
4. DFT analysis of images.
5. Walsh Transform.
6. Basic Threshold functions
7. Image segmentation –line detection
8. Region based Segmentation
9. Image compression techniques.
10. Image restoration

Pedagogical method used:

[1]Blended Learning
[3]Constructivist Learning
[4]E-mind Map
[10]Participative Learning

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

CO1	**K2**	Understand the fundamental concepts of digital image processing.
CO2	**K2 K3**	Perform various 2D Image transformations
CO3	**K4**	Create image enhancement processing techniques and filters
CO4	**K3 K4**	Implement the classification of Image segmentation techniques
CO5	**K4 K5**	Implement various image compression techniques

Mapping with Program Outcomes and Program Specific Outcomes:

CO/ PO&PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓				✓				
CO2		✓					✓	✓		
CO3			✓	✓		✓			✓	
CO4				✓			✓		✓	
CO5					✓				✓	✓