



# **Bachelor of Computer Application ( WITH SPECIALIZATION IN IOT)**

## **Curriculum and Syllabus Regulation 2022**

**Based on Choice Based Credit System (CBCS)**

**and**

**Learning Outcomes based Curriculum Framework (LOCF))**

**Effective from the Academic year**

**2022-2023**

**Department of Computer Applications  
School of Computing Sciences**

# **DEPARTMENT OF COMPUTER APPLICATIONS SCHOOL OF COMPUTING SCIENCES**

## **VISION**

Our Vision is to be a center of excellence in IT education, training and research, aiming towards carrying out advanced research and development in information and software technologies, and in leveraging IT in specific domain areas enabling students to become innovators and entrepreneurs.

## **MISSION**

- To be a department of excellence in technical education, widely known for the development of competent and socially responsible IT professionals, entrepreneurs and researchers.
- To promote professionals with knowledge and understanding, by providing them with latest developments in Computer Applications so that they contribute not only to the progress of software and its applications but even encompass the entire domain of computertechnology.
- To impart quality education for long lasting development and opportunity in an extensivecareer in the various fields of Computer science / Information Technology.
- To increase innovative learning to the needs of Industry and Society
- To be the source of bringing out globally competent pioneering computing professionals, researchers, innovators and entrepreneurs.

## **PROGRAM EDUCATIONAL OBJECTIVES (PEO)**

- PEO1:** Emerge as globally competent computer professionals in multidisciplinary domains.
- PEO2:** Excel as socially committed individual having an ethical values and empathy for the need of society
- PEO3:** Become an entrepreneur possessing a leadership skill that can provide solutions and develop software products.
- PEO4:** Involve in lifelong learning to adapt the latest technologies and advancements in the emerging areas of computer applications.
- PEO5 :** Provide technical & skill based quality training to the students in the field of Information technology

## **PROGRAM OUTCOME (PO)**

**PO1: Computational Knowledge:** Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.

**PO2: Problem Analysis:** Identify, formulate, research literature, and solve complex computing problems reaching Substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.

**PO3: Design /Development of Solutions:** Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

**PO4: Conduct Investigations of Complex Computing Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5: Modern Tool Usage:** Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the

limitations.

**PO6: Professional Ethics:** Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.

**PO7: Life-long Learning:** Recognize the need, and have the ability, to engage in independent learning for continual Development as a computing professional.

**PO8: Project management and finance:** Demonstrate knowledge and understanding of the computing and management Principles and apply these to one's own work, as a member and leader in a team, to Manage projects and in multidisciplinary environments.

**PO9: Communication Efficacy:** Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

**PO10: Societal and Environmental Concern:** Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice.

#### **4.2 Programme Specific Outcome**

**PSO1:** Be well versed in the various software and logical skills like Java Programming, Python Programming, Database concepts etc.

**PSO2:** Be competent in the fundamentals of software and hardware concepts and the emerging technologies in networks, recent trends in computer science field.

# Vels Institute of Science Technology & Advanced Studies

## School of Computing Sciences Department of Computer Applications

### Board of Studies Members

S.No	Name & Designation	Address	Role
1	Dr.P.Mayilvahanan Professor & Director , SCS	School of Computing Sciences, VISTAS, Chennai.	Chairman
2	Dr. T. Velmurugan Associate Professor & Head	Department of Computer Science, DG Vaishnav College, Chennai.	Industry Expert (External Member)
3	Dr. P. Magesh Kumar Managing Director	Calibsoft Technologies Pvt Ltd., Chennai.	Academic Expert (External Member)
4	Mr.R. Balamurugan Software Engineer	SCOPUS Technologies Ltd., Chennai	Alumni Member
5	Dr.S.Prasanna Professor & Head	Department of Computer Applications, School of Computing Sciences, VISTAS, Chennai	Internal Member
6	Dr. T. Kamalakannan Professor & Head	Department of Information Technology, School of Computing Sciences, VISTAS, Chennai	Internal Member

**VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED  
STUDIES (VISTAS), CHENNAI  
CHOICE BASED CREDIT SYSTEM (CBCS)  
and  
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (LOCF)  
UG REGULATIONS 2021  
BCA WITH SPECIALIZATION IN IOT DEGREE**

**(Applicable to all the candidates admitted from the academic year 2021-22 onwards)**

**1. DURATION OF THE PROGRAMME**

- 1.1. Three years (six semesters)
- 1.2. Each academic year shall be divided into two semesters. The odd semesters shall consist of the period from July to November of each year and the even semesters from January to May of each year.
- 1.3 There shall be not less than 90 working days for each semester.

**2. ELIGIBILITY FOR ADMISSION**

Students should have passed the Higher Secondary Examinations of (10+2) stream with **Computer Science** or **Mathematics/Business Maths** as one of the subjects or any examination of any other authority accepted by the Board of Management of VISTAS.

**3. MEDIUM OF INSTRUCTION**

The medium of instruction for all UG programmes is English excluding Tamil, Hindi and French Language Papers

#### **4. CREDIT REQUIREMENTS AND ELIGIBILITY FOR AWARD OF DEGREE**

A Candidate shall be eligible for the award of Degree only if he/she has undergone the prescribed course of study in VISTAS for a period of not less than three academic years and passed the examinations of all the prescribed courses of Six Semesters earning a minimum of 140 credits as per the distribution given in for Part I, II, III and also fulfilled such other conditions as have been prescribed thereof.

#### **5. COURSE**

Each course / subject is to be designed under lectures / tutorials / laboratory or field work / seminar / practical training / Assignments / Term paper or Report writing etc., to meet effective teaching and learning needs.

#### **6. COURSE OF STUDY AND CREDITS**

The Course Components and Credit Distribution shall consist Part I, II & III:

**The UG** programme consists of a number of courses. The term ‘course’ is applied to indicate a logical part of the subject matter of the programme and is invariably equivalent to the subject matter of a ‘paper’ in the conventional sense. The following are the various categories of courses suggested for the UG programmes.

**Part I** – Language Courses (LC) (any one of Tamil, Hindi, French or special subject designed in lieu of the above).

**Part II** – English Language courses (ELC) or special subject designed in lieu of.

The Language courses and English Language Courses are 4 each / 2 each in number and the LC and ELC are meant to develop the students communicative skill at the UG level.

**Part III** – Core courses i.e. major courses that compulsorily required for each of the programme of study (CC), Ability Enhancement Course (AHC), Discipline Specific Elective Course (DSE) and Skill Enhancement Course (SEC).

For each course, credit is assigned based on the following:

Contact hour per week		CREDITS
1 Lecture hour	-	1 Credit
1 Tutorial hour	-	1 Credit

2 Practical hours - 1 Credit  
(Laboratory / Seminar / Project Work / etc.)

## 7. REQUIREMENTS FOR PROCEEDING TO SUBSEQUENT SEMESTER

- 7.1. **Eligibility:** Students shall be eligible to go to subsequent semester only if they earn sufficient attendance as prescribed therefor by the Board of Management from time to time.
- 7.2. **Attendance:** All Students must earn 75% and above of attendance for appearing for the University Examination. (Theory/Practical)
- 7.3. **Condonation of shortage of attendance:** If a Student fails to earn the minimum attendance (Percentage stipulated), the HODs shall condone the shortage of attendance on medical grounds up to a maximum limit of 10% (i.e. between 65% and above and less than 75%) after paying the prescribed fee towards the condonation of shortage of attendance. The students with attendance of less than 65 and more than 50% shall be condoned by VC on the recommendation of HODs on genuine grounds, will be permitted to appear for the regular examination on payment of the prescribed condonation fee.
- 7.4. **Detained students for want of attendance:** Students who have earned less than 50% of attendance shall be permitted to proceed to the next semester and to complete the Program of study. Such Students shall have to repeat the semester, which they have missed by rejoining after completion of final semester of the course, by paying the fee for the break of study as prescribed by the University from time to time.
- 7.5. **Transfer of Students and Credits:** The strength of the credits system is that it permits inter Institutional transfer of students. By providing mobility, it enables individual students to develop their capabilities fully by permitting them to move from one Institution to another in accordance with their aptitude and abilities.
- 7.5.1. Transfer of Students is permitted from one Institution to another Institution for the same program with same nomenclature, provided, there is a vacancy in the respective program of Study in the Institution where the transfer is requested.
- 7.5.2. The marks obtained in the courses will be converted into appropriate grades as per the University norms.
- 7.5.3. The transfer students are not eligible for Ranking, Prizes and Medals.



7.5.4. Students who want to go to foreign Universities upto two semesters or Project Work with the prior approval of the Departmental / University Committee are allowed to transfer of their credits. Marks obtain in the courses will be converted into Grades as per the University norms and the students are eligible to get CGPA and Classification.

## **8. EXAMINATION AND EVALUATION**

### **8.1. Examination:**

8.1.1 There shall be examinations at the end of each semester, for odd semesters in the month of 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 courses in the subsequent examinations to be held in October / November or April / May.

8.1.2 A candidate should get registered for the first semester examination. If registration is not possible owing to shortage of attendance beyond condonation limit / regulations prescribed OR belated joining OR on medical grounds, the candidates are permitted to move to the next semester. Such candidates shall re-do the missed semester after completion of the programme.

8.1.3 The results of all the examinations will be published through University Website. In the case of passed out candidates, their arrear results, will be published through University Website.

### **8.2 To Register For All Subjects:**

Students shall be permitted to proceed from the First Semester up to Final Semester irrespective of their failure in any of the Semester Examination, except for the shortage of attendance programs. For this purpose, Students shall register for all the arrear subjects of earlier semesters along with the current (subsequent) Semester Subjects.

### **8.3. Marks for Continuous Internal Assessment (CIA) Examinations and End Semester**

Examinations (ESE) for PART I, II, III

8.3.1 There shall be no passing minimum for Continuous Internal Assessment (CIA) Examinations.

8.3.2 For End Semester examination, passing minimum shall be 40% (Forty Percentage) of the maximum marks prescribed for the Course/Practical/Project and Viva-Voce.

8.3.3 In the aggregate (CIA and ESE) the passing minimum shall be of 40%.

8.3.4. He / She shall be declared to have passed the whole examination, if he/she passes in all the courses wherever prescribed in the curriculum by earning 140 CREDITS in PartI, II, III.

## **9. QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION**

SECTION – A	10 questions 10 X 2 = 20 Marks
SECTION – B	5 questions either or pattern X 16 = 80 Marks
	Total 100 Marks

**10. SUPPLEMENTARY EXAMINATION:** Supplementary Examinations are conducted for the students who appeared in the final semester examinations. Eligible criteria for appearing in the Supplementary Examinations are as follows:

10.1. Eligibility: A Student who is having a maximum of two arrear papers is eligible to appear for the Supplementary Examination.

10.2. Non-eligibility for those completed the program: Students who have completed their Program duration but having arrears are not eligible to appear for Supplementary Examinations.

## **11. RETOTALLING, REVALUATION AND PHOTOCOPY OF THE ANSWER SCRIPTS :**

11.1. Re-totalling: All UG Students who appeared for their Semester Examinations are eligible for applying for re-totalling of their answer scripts.

11.2. Revaluation: All current batch Students who have appeared for their Semester Examinations are eligible for Revaluation of their answer scripts. Passed out candidates are not eligible for Revaluation.

11.3. Photocopy of the answer scripts: Students who have applied for revaluation can download their answer scripts from the University Website after fifteen days from the date of publication of the results.

**12. THE EXAMINATION AND EVALUATION FOR MOOCS** will be as per the

requirements of the regulatory bodies and will be specified at the beginning of the Semester and notified by the university NPTEL-SWAYAM Coordinator (SPOC).

### 13. CLASSIFICATION OF SUCCESSFUL STUDENTS

13.1. Part I Tamil / Other Languages; Part II English And Part III Core Subjects, Allied, Electives Courses And Project: Successful Students passing the Examinations for the Part I, Part II and Part III courses and securing the marks

- a) CGPA 9.00 to 10.00 shall be declared to have passed the examination in **First class with Outstanding**.
- b) CGPA 7.50 to 8.99 shall be declared to have passed the examination in **First class with distinction**.
- c) CGPA 6.00 to 7.49 shall be declared to have passed the examination in **First Class**.
- d) CGPA 5.00 to 5.99 in the aggregate shall be declared to have passed the examination in the **SECOND** Class.
- e) CGPA 4.00 to 4.99 shall be declared to have passed the examination in the **THIRD** Class.

**14. MARKS AND GRADES:** The following table shows the marks, grade points, letter grades and classification to indicate the performance of the Student:

**14.1. Computation of Grade Point Average (GPA) in a Semester, Cumulative Grade Point Average (CGPA) and Classification**

GPA for a Semester: =  $\sum_i C_i G_i \div \sum_i C_i$  That is, GPA is the sum of the multiplication of grade points by the credits of the courses divided by the sum of the credits of the courses in a semester.

Where,  $C_i$  = Credits earned for course  $i$  in any semester,

$G_i$  = Grade Points obtained for course  $i$  in any semester

$n$  = Semester in which such courses were credited.

CGPA for the entire programme: =  $\sum_n \sum_i C_{ni} G_{ni} \div \sum_n \sum_i C_{ni}$  That is, CGPA is the sum of the multiplication of grade points by the credits of the entire programme divided by the sum of the credits of the courses of the entire programme

<b>Grade Conversion Table – UG</b>			
<b>Range of Marks</b>	<b>Grade Points</b>	<b>Letter Grade</b>	<b>Description</b>
90 – 100	10	O	Outstanding
82 – 89	9	A+	Excellent
75 – 81	8	A	Very Good
67 – 74	7	B+	Good
60 – 66	6	B	Above Average
50 – 59	5	C	Average
40 – 49	4	D	Minimum for pass
0 – 39	0	RA	Reappear
		AAA	Absent

#### 14.2. Letter Grade and Class CGPA

<b>Overall Performance – UG</b>		
<b>CGPA</b>	<b>GRADE</b>	<b>CLASS</b>
4.00 - 4.99	D	Third Class
5.00 - 5.99	C	Second Class
6.00 - 6.69	B	First Class
6.70 - 7.49	B+	
7.50 - 8.19	A	First Class with Distinction*
8.20 - 8.99	A+	
9.00 - 10.00	O	First Class - Outstanding*

- The Students who have passed in the first appearance and within the prescribed semester of the UG Programme (Major, Allied and Elective courses only) are eligible.

## **15. RANKING**

- 15.1 Students who pass all the examinations prescribed for the Program in the FIRST APPEARANCE ITSELF ALONE are eligible for Ranking / Distinction.
- 15.2 In the case of Students who pass all the examinations prescribed for the Program with a break in the First Appearance are only eligible for Classification.
- 15.3 Students qualifying during the extended period shall not be eligible for RANKING.

## **16. MAXIMUM PERIOD FOR COMPLETION OF THE PROGRAMS TO QUALIFY FOR A DEGREE**

- 16.1. A Student who for whatever reasons is not able to complete the programs within the normal period (N) or the Minimum duration prescribed for the programme, may be allowed two years period beyond the normal period to clear the backlog to be qualified for the degree. (Time Span = N + 2 years for the completion of programme)
- 16.2. In exceptional cases like major accidents and child birth an extension of one year considered beyond maximum span of time (Time Span= N + 2 + 1 years for the completion of programme).

## **17. REVISION OF REGULATIONS, CURRICULUM AND SYLLABI**

The University may from time to time revise, amend or change the Regulations, Curriculum, Syllabus and Scheme of examinations through the Academic Council with the approval of the Board of Management.

# Vels Institute of Science and Technology and Advanced studies (VISTAS)

## BCA WITH SPECIALIZATION IN IOT DEGREE Courses of Study and Scheme of Assessment

**Total No of Credits: 140**

### BCA WITH SPECIALIZATION IN IOT Course Components

<b>Component</b>	<b>I Sem</b>	<b>II Sem</b>	<b>III Sem</b>	<b>IV Sem</b>	<b>V Sem</b>	<b>VI Sem</b>	<b>Total Credits</b>
Core Courses & Languages	14	14	14	20		-	90
Ability Enhancement Courses (AEC)	10	10	2	-	-	-	4
Discipline Specific Elective (DSE) & Generic Elective(GEC)	-	-	-	2	16	17	29
Skill enhancement Course(SEC) & DE	-	-	4	4	4	7	17
<b>Total Credits</b>	<b>24</b>	<b>24</b>	<b>22</b>	<b>26</b>	<b>20</b>	<b>24</b>	<b>140</b>

**Learning Outcomes-Based Curriculum Framework**  
**Undergraduate Education**  
**B.C.A WITH SPECIALIZATION IN IOT**

## **1. Introduction**

The Learning Outcomes-Based Curriculum Framework (LOCF) for the undergraduate programs like B.C.A WITH SPECIALIZATION IN IOT , is intended to provide a broad framework to create an academic base that responds to the need of the students to understand the basics of B.C.A WITH SPECIALIZATION IN IOT .

The IT industry is growing rapidly and hence the demand for BCA WITH SPECIALIZATION IN IOT graduates is increasing every passing day. The Bachelor of Computer Applications (BCA WITH SPECIALIZATION IN IOT) is an undergraduate program which is three-year program that span six semesters. It is designed to bridge the gap between the studies of computers and its applications. This program aims to shape computer professionals with the right moral and ethical values and can prepare students to face the challenges and opportunities in IT industries by building strong foundations. The syllabus focuses on the core fundamentals of computer science, but generally undergoes revision according to the industry requirement with the aim of increasing employment opportunities for students. After obtaining a BCA WITH SPECIALIZATION IN IOT degree, students can find well-paid job opportunities in leading IT companies. The roles that one can bag after completing a BCA WITH SPECIALIZATION IN IOT programme is that of a System engineer, software tester, junior programmer, web developer, system administrator, software developer, etc. BCA WITH SPECIALIZATION IN IOT graduates are not only recruited by the private sector but also by public sector. Government organizations like Indian Air Force(IAF), Indian Army, and India Navy hire a large bunch of computer professionals for their IT department.

## **2. Learning Outcomes Based Approach To Curriculum Planning**

### **2.1 *Nature and extent of UG program in B.C.A WITH SPECIALIZATION IN IOT***

The UG programs in B.C.A WITH SPECIALIZATION IN IOT builds on the basic Computer

Science taught at the +2 level in all the schools in the country. Ideally, the +2 senior secondary school education should aim and achieve a sound knowledge of computer and with sufficient programming knowledge. The curriculum and syllabus should be framed in such way to ignite the young minds of the students to have the urge to innovate and create new approaches for succeeding in IT industry.

## ***2.2 Aims of UG program in B.C.A WITH SPECIALIZATION IN IOT***

The mission is to emerge as a worldwide Conglomerate of premier educational establishment for B.C.A WITH SPECIALIZATION IN IOT, all taking pride in having nurtured data that may result in fulfil the aspirations of IT industries and therefore the Individual.

The primary objective of this program is to produce a foundation of computing principles and business practices for effectively managing information systems and enterprise software package. It helps students to analyze the necessities for system development and exposes students to business software package and information systems. This course provides students with choices to concentrate on application software, system software or mobile applications.

Commit our-self to a mission to stand out in analysis and to form an environment of effective learning, generate a spirit of questioning, enquiry, induce healthy challenges and aggressiveness, feel of complete accomplishment and instinct authority.

## **3. Graduate attributes in B.C.A WITH SPECIALIZATION IN IOT**

Some of the characteristic attributes of a graduate in B.C.A WITH SPECIALIZATION IN IOT

- ❖ Communication Skills
- ❖ Disciplinary knowledge
- ❖ Critical thinking
- ❖ Analytical reasoning
- ❖ Problem solving
- ❖ Reflective thinking
- ❖ Leadership qualities



- ❖ Scientific reasoning
- ❖ digital literacy
- ❖ Team work
- ❖ Skilled project manager
- ❖ Ethical awareness / reasoning
- ❖ Lifelong learners
- ❖ Self-directed learning

## **4. Programme learning outcomes relating to B.C.A WITH SPECIALIZATION IN IOT**

### ***4.1 Programme Outcome***

**PO1: Computational Knowledge:** Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.

**PO2: Problem Analysis:** Identify, formulate, research literature, and solve complex computing problems reaching Substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.

**PO3: Design /Development of Solutions:** Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

**PO4: Conduct Investigations of Complex Computing Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation

of data, and synthesis of the information to provide valid conclusions.

**PO5: Modern Tool Usage:** Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.

**PO6: Professional Ethics:** Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.

**PO7: Life-long Learning:** Recognize the need, and have the ability, to engage in independent learning for continual Development as a computing professional.

**PO8: Project management and finance:** Demonstrate knowledge and understanding of the computing and management Principles and apply these to one's own work, as a member and leader in a team, to Manage projects and in multidisciplinary environments.

**PO9: Communication Efficacy:** Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

**PO10: Societal and Environmental Concern:** Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice.

#### **4.2 Programme Specific Outcome**

**PSO1:** Be well versed in the various software and logical skills like Java Programming, Python Programming, Database concepts etc.

**PSO2:** Be competent in the fundamentals of software and hardware concepts and the emerging technologies in networks, recent trends in computer science field.

## **5. Degree of Bachelor Of Computer Applications With Specialization In IoT**

### ***5.1 Duration Of the Programme***

- ❖ Three years (six semesters)
- ❖ Each academic year shall be divided into two semesters. The odd semesters includes the period from July to November and the even semesters from January to May of each year.
- ❖ There shall not be less than 90 working days for each semester.

### ***5.2. Eligibility for Admission***

Students should have passed the Higher Secondary Examinations of (10+2) stream with **Computer Science/Mathematics/Business Maths** as one of the subjects or any examination of any other authority accepted by the Board of Management of VISTAS.

### ***5.3. Credit Requirments And Eligibility For Award Of Degree***

A Candidate shall be eligible for the award of the Degree only if he/she has undergone the prescribed course of study in a College affiliated to the University for a period of not less than three academic years and passed the examinations of all the Six Semesters prescribed earning a minimum of 140 credits as per the distribution given in for Part I, II, III, IV & V and also fulfilled such other conditions as have been prescribed thereof.

### ***5.4. Course Of Study, Credits And Scheme Of Examination***

The Course Components and Credit Distribution shall consist Part I, II & III:

(Minimum number of Credits to be obtained)

Credit Assignment Each course is assigned certain number of credits based on the following:  
Contact period per week CREDITS

1 Lecture Period - 1 Credit

1 Tutorial Period - 1 Credit

2 Practical Periods - 1 Credit

(Laboratory / Seminar / Project Work / etc.)

### ***5.5. Requirements For Proceeding To Subsequent Semester***

- ❖ **Eligibility:** Students shall be eligible to go to subsequent semester only if they earn sufficient attendance as prescribed by the Board of Management from time to time.
- ❖ **Attendance:** All Students must earn 75% and above of attendance for appearing for the University Examination. (Theory/Practical)
- ❖ **Condonation of shortage of attendance:** If a Student fails to earn the minimum attendance (Percentage stipulated), the HODs shall condone the shortage of attendance up to a maximum limit of 10% (i.e. between 65% and above and less than 75%) after collecting the prescribed fee towards the condonation of shortage of attendance. Such fees collected and should be remitted to the University.
- ❖ **Non-eligibility for condonation of shortage of attendance:** Students who have secured less than 65 % but more than 50 % of attendance are NOT ELIGIBLE for condonation of shortage of attendance and such Students will not be permitted to appear for the regular examination, but will be allowed to proceed to the next year/next semester of the program
- ❖ **Detained students for want of attendance:** Students who have earned less than 50% of attendance shall be permitted to proceed to the next semester and to complete the Program of study. Such Students shall have to repeat the semester, which they have missed by rejoining after completion of final semester of the course, by paying the fee for the break of study as prescribed by the University from time to time.
- ❖ **Condonation of shortage of attendance for married women students:** In respect of married women students undergoing UG programs, the minimum attendance for condonation (Theory/Practical) shall be relaxed and prescribed as 55% instead of 65% if they conceive during their academic career. Medical certificate from the Doctor together with the attendance details shall be forwarded to the university to consider the condonation of attendance mentioning the category.

- ❖ **Zero Percent (0%) Attendance:** The Students, who have earned 0% of attendance, have to repeat the program (by rejoining) without proceeding to succeeding semester and they have to obtain prior permission from the University immediately to rejoin the program.
- ❖ **Transfer of Students and Credits:** The strength of the credits system is that it permits inter Institutional transfer of students. By providing mobility, it enables individual students to develop their capabilities fully by permitting them to move from one Institution to another in accordance with their aptitude and abilities.
- ❖ Transfer of Students is permitted from one Institution to another Institution for the same program with same nomenclature. Provided, there is a vacancy in the respective program of Study in the Institution where the transfer is requested. Provided the Student should have passed all the courses in the Institution from where the transfer is requested.
- ❖ The marks obtained in the courses will be converted and grades will be assigned as per the University norms.
- ❖ The transfer students are not eligible for classification.
- ❖ The transfer students are not eligible for Ranking, Prizes and Medals.
- ❖ Students who want to go to foreign Universities up to two semesters or Project Work with the prior approval of the Departmental/College Committee are allowed to get transfer of credits and marks which will be converted into Grades as per the University norms and are eligible to get CGPA and Classification; they are not eligible for Ranking, Prizes and Medals.

### ***5.6. Examination and Evaluation***

- ❖ Register for all subjects: Students shall be permitted to proceed from the First Semester up to Final Semester irrespective of their failure in any of the Semester Examination. For this purpose, Students shall register for all the arrear subjects of earlier semesters along with the current (subsequent) Semester Subjects.
- ❖ Marks for Internal and End Semester Examinations for PART I, II, III
- ❖ There shall be no passing minimum for Internal.

- ❖ For external examination, passing minimum shall be 40% [Forty Percentage] of the maximum marks prescribed for the paper for each Paper/Practical/Project and Viva-Voce.
- ❖ In the aggregate [External/Internal] the passing minimum shall be of 40%.
- ❖ He / She shall be declared to have passed the whole examination, if he/she passes in all the papers and practical wherever prescribed as per the scheme of the examinations by earning 140 CREDITS in Part I, II, III.

#### ***5.7. Maximum Period For Completion Of The Programs To Qualify For A Degree***

- ❖ A Student who for whatever reasons is not able to complete the programs within the normal period (N) or the Minimum duration prescribed for the programme, may be allowed two years period beyond the normal period to clear the backlog to be qualified for the degree. (Time Span = N + 2 years for the completion of programme)

#### ***5.8. Revision Of Regulations, Curriculum And Syllabi***

- ❖ The University may from time to time revise, amend or change the Regulations, Curriculum, Syllabus and Scheme of examinations through the Academic Council with the approval of the Board of Management.

**VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES (VISTAS)**

**BCA WITH SPECIALIZATION IN IOT DEGREE COURSE**

**COURSES OF STUDY AND SCHEME OF ASSESSMENT**

**TOTAL NO OF CREDITS: 140**

**I SEMESTER**

Category	Code	Course	Hour / Week			Credits
			Lecture	Tutorial	Practical	
CORE		Problem Solving and Object Oriented Programming	4	0	0	4
CORE		Digital Logic Fundamentals	4	0	0	4
CORE		Mathematics – I	4	0	0	4
CORE		Practical – I Programming in C++	0	0	6	2
AECC		Ability Enhancement Compulsory Courses - I	5	0	0	5
AECC		English paper - I	5	0	0	5
<b>Total</b>			<b>22</b>	<b>0</b>	<b>6</b>	<b>24</b>

**II SEMESTER**

Category	Code	Course	Hour / Week			Credits
			Lecture	Tutorial	Practical	
CORE		Design and Analysis of Algorithms	4	0	0	4
CORE		Open Source Programming for IoT	4	0	0	4
CORE		Mathematics – II	4	0	0	4
CORE		Practical – II Open Source Programming in IoT	0	0	6	2
AECC		Ability Enhancement Compulsory Courses - II	5	0	0	5
AECC		English paper –II	5	0	0	5
<b>Total</b>			<b>22</b>	<b>0</b>	<b>6</b>	<b>24</b>

### III SEMESTER

Category	Code	Course	Hour / Week			Credits
			Lecture	Tutorial	Practical	
CORE		Microprocessor and Microcontrollers	4	0	0	4
CORE		Financial accounting	4	0	0	4
CORE		Computer Networks	4	0	0	4
CORE		Practical – III Microprocessor Lab	0	0	6	2
SEC		Skill Enhancement Courses – I	4	0	0	4
GE		Generic Elective Courses -I	2	0	0	2
AECC		Environmental Studies	2	0	0	2
		<b>Total</b>	<b>24</b>	<b>0</b>	<b>6</b>	<b>22</b>

### IV SEMESTER

Category	Code	Course	Hour / Week			Credits
			Lecture	Tutorial	Practical	
CORE		IoT and Multimedia Technology	3	0	0	4
CORE		Java Programming	4	0	0	4
CORE		Statistical & Numerical Methods	4	0	0	4
CORE LAB		Practical – Java	0	0	4	2
CORE		Cloud Computing	4	0	0	4
CORE. LAB		Practical – V Cloud Computing Lab	0	0	4	2
SEC		Skill Enhancement Courses –III	3	0	0	4
GE		Generic Elective Courses –II	2	0	0	2
		<b>Total</b>	<b>22</b>	<b>0</b>	<b>8</b>	<b>26</b>



### V SEMESTER

Sl. No	Code	Course	Hour / Week			Credits
			Lecture	Tutorial	Practical	
DSE 1		Discipline Specific Elective- I	3	0	0	3
DSE 2		Discipline Specific Elective- II	3	0	0	3
DSE 3		Discipline Specific Elective- III	3	0	0	3
DSE 4		Discipline Specific Elective- IV	3	0	0	3
DSE LAB		Practical – DSE	0	0	4	2
DSE LAB		Practical – DSE	0	0	4	2
SEC		Internship / Mini Project / Sector Skill Council Course	0	4	2	4
SEC		Skill Enhancement Training / Student Club Activities	-	-	-	-
<b>Total</b>			<b>12</b>	<b>4</b>	<b>10</b>	<b>20</b>

### VI SEMESTER

Sl. No	Code No.	Course	Hour / Week			Credits
			Lecture	Tutorial	Practical	
DSE 5		Discipline Specific Elective- V	3	0	0	3
DSE 6		Discipline Specific Elective- VI	3	0	0	3
DSE 7		Discipline Specific Elective- VII	3	0	0	3
DSE 8		Discipline Specific Elective- VIII	3	0	0	3
DSE 9		Discipline Specific Elective- IX	3	0	0	3
DSE LAB		DSE LAB	0	0	6	2
SEC	Entrepreneurship Development	SEC	2	0	6	2
DE	Capstone Project Work	DE	0	0	6	5
<b>Total</b>			<b>17</b>	<b>0</b>	<b>18</b>	<b>24</b>

### List of Discipline Specific Elective Courses (DSE)

	<b>SNO</b>	<b>COURSE</b>
<b>DSE 1</b>	<b>1</b>	Sensors and Actuator Devices for IoT
	<b>2</b>	Embedded System Design
	<b>3</b>	Cryptography and Network Security
<b>DSE 2</b>	<b>4</b>	Operating systems
	<b>5</b>	Database Management systems
	<b>6</b>	Internet Programming and Web Technologies
<b>DSE 3</b>	<b>7</b>	Deep Learning
	<b>8</b>	Privacy and Security in IoT
	<b>9</b>	Data Modeling and Simulation
<b>DSE 4</b>	<b>10</b>	Architecting smart IoT devices
	<b>11</b>	Wearable Computing
	<b>12</b>	Industrial and Medical IoT
<b>DSE 5</b>	<b>13</b>	Design of Smart Systems
	<b>14</b>	Programming for IoT Boards
	<b>15</b>	Wireless Ad-hoc networks
<b>DSE 6</b>	<b>16</b>	Design of Smart Cities
	<b>17</b>	Introduction to Industry 4.0
	<b>18</b>	Cognitive IoT
<b>DSE 7</b>	<b>19</b>	IoT Architecture and its Protocols
	<b>20</b>	Image Processing
	<b>21</b>	Applications of IoT in Robotics
<b>DSE 8</b>	<b>22</b>	Mobile Application Development for IoT
	<b>23</b>	Natural Language Processing
	<b>24</b>	Big Data Analytics
<b>DSE 9</b>	<b>25</b>	Artificial Intelligence
	<b>26</b>	Cyber Physical Systems
	<b>27</b>	Machine Learning

Total Credits to complete the course : 140  
Total Marks : 4000

**List of Ability Enhancement Compulsory Courses (AECC)**

<b>S.NO</b>	<b>COURSE</b>
1	TAMIL I HINDI I FRENCH I
2	Foundation Course English – I
3	TAMIL – II HINDI – II FRENCH – II
4	Foundation Course English – II
5	Environmental Studies

**List of Skill Enhancement Courses (SEC)**

<b>S.NO</b>	<b>COURSE</b>
1	ENGLISH PAPER – III
2	NSS PAPER – I
3	ENGLISH PAPER – IV
4.	ENTREPRENEURSHIP DEVELOPMENT

