



**UNIVERSITY OF CALICUT**

**Abstract**

BVoc programme in Software Development – under Modified BVoc Regulations 2014 – Scheme and Syllabus - implemented w.e.f 2014 admission onwards - Orders issued

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**G & A - IV - J**

U.O.No. 4256/2015/Admn

Dated, Calicut University.P.O, 27.04.2015

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- Read:-*1) Minutes of the meeting of the principals of the colleges got permission to start BVoc programmes and Community College programme held on 19.06.14
- 2) Minutes of the combined meeting for the approval of BVoc Syllabus
- 3) BVoc Regulations implemented as per U.O.No. 9809/2014/Admn Dtd 23.10.2014
- 4) Minutes of the Faculty of Science 22.12.14
- 5) The minutes of the meeting of Academic Council held on 15.01..2015
- 6) Modified BVoc Regulations U.O.No. 2650/2015/Admn Dtd :17.03.2015
- 7) Corrected syllabus forwarded by the Chairman, Computer Science PG
- 8) Orders of Vice Chancellor in the File No: 141170/GA - IV -J1/2014/Admn on 16.02.15

**ORDER**

As per the paper read as (1) above the Draft Regulations for BVoc Programmes have been prepared. As per paper read as (2) the syllabus fo BVoc in Software Development has been approved. As per paper read as (3) The BVoc Regulations have been implemented.

As per the paper read as (4) the Minutes of the Combined Meeting for the approval of BVoc Syllabi have been approved by the Faculty of Science. As per paper read as (5) the Academic council has approved the decisions of Faculty of Science. As per paper read as (6) the Bvoc Regulations have been finalised and implemented. Minor corrections have been made in the approved syllabus in tune with the modified regulations and as per paper read as (7) the Chairman, BOS in Computer Science PG has forwarded the corrected Syllabus.

As per paper read as (8) the Vice Chancellor has approved to implement the decision of the Academic Council. Sanction has, therefore, been accorded for the implementation of the Scheme and Syllabus of BVoc programme in Software Development under BVoc Regulations 2014, in the University, w.e.f 2014 Admissions.

Orders are issued accordingly.

(The syllabus is available in the website: [universityofcalicut.info](http://universityofcalicut.info))

Usha K  
Deputy Registrar

To

Forwarded / By Order

Section Officer

**UNIVERSITY OF CALICUT**  
THENHIPALAM, CALICUT UNIVERSITY P.O



**DEGREE OF**  
**BACHELOR OF VOCATION (B.VOC)**  
IN  
**SOFTWARE DEVELOPMENT**

UNDER THE

**FACULTY OF SCIENCE**

**SYLLABUS**

(FOR THE STUDENTS ADMITTED FROM THE ACADEMIC YEAR 2014 – 15 ONWARDS)

**BOARD OF STUDIES IN COMPUTER SCIENCE (UG)**

THENHIPALAM, CALICUT UNIVERSITY P.O

KERALA, 673 635, INDIA

JULY, 2014

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## **REGULATIONS FOR THE DEGREE OF**

# **BACHELOR OF VOCATION (SOFTWARE DEVELOPMENT)**

**EFFECTIVE FROM THE ACADEMIC YEAR 2014-15**

### **1. PROGRAMME OBJECTIVES**

The B. Voc courses are designed with the following objectives,

- a) To provide judicious mix of skills relating to a profession and appropriate content of General Education.
- b) To ensure that the students have adequate knowledge and skills, so that they are work ready at each exit point of the programme.
- c) To provide flexibility to the students by means of pre-defined entry and multiple exit points.
- d) To integrate NSQF within the undergraduate level of higher education in order to enhance employability of the graduates and meet industry requirements. Such graduates apart from meeting the needs of local and national industry are also expected to be equipped to become part of the global workforce.
- e) To provide vertical mobility to students coming out of 10+2 with vocational subjects

### **2. GENERAL PROGRAMME STRUCTURE**

The B. Voc Programme is designed to bridge the potential skill gap identified. The curriculum in each of the years of the programme would be a suitable mix of general education and skill development components.

#### **GENERAL EDUCATION COMPONENTS**

- a The general education component provides emphasis to Communication skill, Presentation skill, Health and Safety, Industrial Psychology, Environmental awareness, Entrepreneurship development and other relevant subjects in the field.
- b An option for additional language should be provided which enhances the employability outside the state.
- c General Education Components should not exceed 40% of the curriculum
- d All B.Voc Programme should follow the General education component pattern listed below (Common English Courses and Additional language courses of LRP programmes of CUCBCSSUG 2014)

No	Semester	Course No	Course Code	Paper
1	1	1.1	GEC1EG01	A01 The Four Skills for Communication
2	1	1.2	GEC1ML02 GEC1AR02 GEC1HD02	MAL1A01(2) Malayalam-Bhashayum Sahithyavum-I ARB1A07(1) Arabic-Communication Skills in Arabic(Muvasalath wa Murasarath; Dr. Mohammed Haneefa P)
3	2	2.1	GEC2EG04	A02 Modern Prose & Drama
4	2	2.2	GEC2ML05 GEC2AR05	MAL2A02(2)- Malayalam-Bhashayum Sahithyavum-II ARB2A08(1)-Literature In Arabic
5	3	3.1	GEC3EG07	A03 Inspiring Expressions
6	4	4.1	GEC4EG10	A04 Readings on Society

**SKILL DEVELOPMENT COMPONENTS:**

- a) This component should match the skill gap identified.
- b) At least 50% of Skill Development Component should be allotted to practical and can grow up to 60% based on the nature of the course. The practical

component can be carried out in the college and/or the industry partner premises.

### **3. LEVELS OF AWARDS**

B. Voc is programme with multiple exits. Following table shows the various certificates and their duration.

<b>Awards</b>	<b>Duration</b>
Diploma	2 Semester
Advance Diploma	4 Semester
B. Voc Degree	6 Semester

1. Students are free to exit at any point in the duration of the programme.
2. Only those students who successfully complete the courses and clear the examination are eligible for the certificate.
3. Separate certificate will be awarded for each year for successful candidates.
4. Students who fail in any course may be allowed to move the higher level but won't be eligible for any certificates until he/she clears previous courses.
5. B. Voc degree will confer to those whose successfully complete the diploma, higher diploma and internship.

### **5. CONDITIONS FOR ADMISSIONS**

#### **ELIGIBILITY**

- The admission to B Voc programme will be as per the rules and regulations of the University for UG admissions.
- **Basic eligibility for B.Voc is 10+2 and above in any stream (No age limit)**
- The eligibility criteria for admission shall be as announced by the University from time to time.
- Separate rank lists shall be drawn up for reserved seats as per the existing rules.

- Grace Marks may be awarded to a student for meritorious achievements in co-curricular activities such as Sports/Arts/ NSS/NCC/ Student Entrepreneurship.
- Preferred subjects and index mark calculations will be decided by the respective Board of Studies.

### **DIPLOMA HOLDERS**

Diploma holders (after 10+2) in the parent courses, approved by the University, who satisfies eligibility criteria can be admitted to the higher diploma( 3rd semester) based on the availability of the seats and is under the sole discretion of the principal of the college/ B. Voc consortium.

### **RESERVATION/QUOTA**

A maximum of 50 students can be admitted to one B. Voc programme. The students can be admitted only to the first semester (except for diploma holders). No students are admitted directly to the Third and Fifth semester in any circumstance except for diploma holders. Diploma holders may be permitted to third semester directly as mentioned above.

The reservation rules for Government/Aided Colleges are as same as that of the regular UG programmes conducted in colleges affiliated to this university.

### **FEES STRUCTURE**

1. The course fee and examination fee for the first three years will be decided by the University. The details of the fee structure for various courses are attached in the annexure 2.
2. The college can collect Caution deposit, PTA fund, special fees, university fees, sports fee etc according to the norms provided by the university at the time of admission.
3. After third year, with the consent of university/UGC, the college can conduct the same programme in self-financing mode (provided UGC not granting further funds). The course fee and examination fee

(Regular/improvement/supplementary) structure in self financing mode will be decided by the University.

## **6. REGISTRATION/RE-REGISTRATION**

Every candidate should register for all subjects of the Semester-End examinations of each semester. A candidate who does not register will not be permitted to attend the Semester-End examinations; he/she shall not be permitted to attend the next semester. A candidate shall be eligible to register for any higher semester, if he/she has satisfactorily completed the course of study and registered for the examination. He/she should register for the semester at the start of the semester before the stipulated date. University will notify the starting and closing dates for each semester.

### **RE-JOINING THE PROGRAMME**

1. Rejoining the course will be allowed to only if the candidate has secured a minimum CGPA of 2.5.
2. The candidate should remit the fees prevailing that time.
3. B. Voc governing council will take the decision regarding the rejoining.

## **7. COURSE CALENDAR**

The B. Voc programme conducted by the affiliated institutions follows a separate calendar from the conversational degree/ PG programme. The programme is distributed over six semesters and each semester constitute 90 working days inclusive of examination.

**Note:** Within a week after the commencement of classes of each semester, Head of each Institution should forward the list of students, details of faculty members allotted from the college and from industry partners along with their qualification and year of experience, to the University. Also, Head of each Institution shall ensure the availability of sufficient number of faculty members having experience and qualifications in the institution.

## **8. ASSESSMENT OF STUDENTS**



Assessment of students for each subject will be done by internal continuous assessment and Semester-End examinations. This dual mode assessment will be applicable to both Theory and Practical courses except for internship and project. Total marks in theory course reflect 80 marks external and 20 marks internal assessments. The mark division for practical courses are 20 marks internal and 80 marks external. For internship and project, there is no internal assessment. (Except for Broadcasting and Journalism, annexure attached).

SI No	Courses	Internal	External
1	Theory	20	80
2.	Practical	20	80
3.	Internship/Project	0	100

### **INTERNAL**

Internal assessment shall be conducted throughout the semester. It shall be based on internal examinations, assignments (such as homework, problem solving, group discussions, quiz, literature survey, seminar, team project, software exercises, etc.) as decided by the faculty handling the course, and regularity in the class. Assignments of every semester shall preferably be submitted in Assignment Book, which is a bound book similar to laboratory record.

The mark distribution to award internal continuous assessment marks for theory subject should be as follows:

Assessment	Mark
Test papers (minimum two, best two out of three is preferred)	10
Assignments (minimum two) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.	5
Regularity in the class	5

The mark distribution to award internal continuous assessment marks for practical subject should be as follows:

<b>Assessment Type</b>	<b>Mark</b>
Evaluation in the lab and Rough Record	10
End-semester Test	4
Viva	1
Regularity	5

**Note:**

1. No candidate will be permitted to attend the end-semester practical examination unless he/she produces certified record of the laboratory.
2. Full credit for regularity in the class can be given only if the candidate has secured minimum 90% attendance in the subject. Attendance evaluation for each course is as follows

<b>Attendance</b>	<b>Marks</b>
90% and Above	5
85 to 89.9%	4
80 to 84.9%	3
76 to 79.9%	2
75 to 75.9 %	1

**External**

- Semester-End examinations for theory and practical courses will be conducted by the University. There shall be University examinations at the end of each semester for both theory and practical. Failed or improvement candidates will have to appear for the Semester-End examinations along with regular students.

- At the starting of each semester, Colleges should prepare question bank (containing maximum questions from each module of various types mentioned in section 13 pattern of question paper.) for the external theory/practical examinations for all courses during that semester and will be sent to the university. University will prepare the question papers and answer keys for each course and will sent back to the college for conducting the examination.
- University will appoint a Chairman for each B.Voc Programme. Chairman will monitor the University Practical Examinations and Evaluation of Theory and Practical papers.
- For the evaluation of theory papers, Chairman should form a team consisting of a chief and required additional Examiners for each course.
- At the starting of each semester, Colleges should prepare a panel of External examiners for conducting Practical examinations. Chairman/University will appoint examiners from the panel proposed by colleges.
- Practical Examinations can be conducted and evaluated from the college or the industry partner premises. The team for conducting and evaluating practical exams should include an examiner appointed from the approved panel of faculties, and an internal examiner.
- Head of Institution/ Chief of Examination of the college should take necessary steps to prevent any malpractices in the Semester-End examinations. If any such instances are detected, they should be reported to the University without any delay.
- University will be issuing mark list, provisional/original certificates to the candidates.

### **INTERNSHIP AND PROJECT**

Internship and the major project should be carried out in the industry, not necessarily with industry partner. The major idea for internship is to implement the things learned and to get a real life experience. The Evaluation process follows 100% external assessment (Except for Broadcasting and Journalism).

1. There will be internship/project at the end of 2<sup>nd</sup> and 4<sup>th</sup> semesters and an internship for the whole sixth semester.
2. Every student will be assigned an internal guide, allotted from the parent department concerned or an expert available in the college appointed by the principal or the head of the department.
3. The student has to make regular discussions with the guide while choosing the subject/area and throughout the life time of the project.
4. At least three reviews should be conducted to evaluate the progress of work.
5. An evaluation team is constituted for conducting the evaluation. The team consist of external examiner, allotted by the university from the approved examination panel, representative from the industry and a faculty.
6. Students should submit a report of their work. A valid certificate from the organization should be produced as a proof that the work is carried out in the respective organization.
7. Students are required to demonstrate the working model of their work (if possible) to the panel of examiners. A viva will be conducted based on the report and students are supposed to clarify the queries regarding their work.
8. Mark distribution for internship assessment.(Except for Broadcasting and Journalism).

Distribution	Marks
Content and relevance of Dissertation	60
Viva	20
Presentation	10

### **MINIMUM FOR PASS**

The successful completion of all the courses prescribed for the diploma/degree programme with E grade (40 %) shall be the minimum requirement for the award of diploma/degree.

### **Notes:**

1. For Project/internship, the minimum for a pass shall be 50% of the total marks assigned to the respective examination.
2. A student who does not secure this pass marks in a subject will have to repeat the respective subject.
3. If a candidate has passed all examinations of B.Voc. Course (at the time of publication of results of last semester) except project/internship in the last semester, a re-examination for the same should be conducted within one month after the publication of results. Each candidate should apply for this Save-A-Year examination within one week after the publication of last semester results.

### **IMPROVEMENT/SUPPLEMENTARY**

Candidates shall be allowed to improve the grade of any two theory courses in a semester. This can be done only in the immediate subsequent chance. If the candidate gets more than 10% mark variations in the improvement chance, marks scored in the improvement chance will be considered for grading of the course; otherwise marks scored in the first attempt will be retained. No candidate shall be permitted to improve the marks scored in practical examinations and internal continuous assessment.

## **9. ATTENDANCE**

A candidate shall be permitted to appear for the Semester-End examinations only if he/she satisfies the following requirements:

- (a) He/she must secure not less than 75% attendance in the total number of working hours in each semester.
- (b) He/she must earn a progress certificate from the head of the institution stating that he/she has satisfactorily completed the course of study prescribed in the semester as required by these regulations.
- (c) His/her conduct must be satisfactory

It shall be open to the Vice Chancellor to grant condonation of shortage of attendance on the recommendation of the head of the institution in accordance with the following norms.

- The shortage shall not be more than 10%

- Shortage up to 20% shall be condoned once during the entire course provided such shortage is caused by continuous absence on genuine medical grounds. • Shortage shall not be condoned more than twice during the entire course.

Candidate who is not eligible for condonation of shortage of attendance shall repeat the semester as per university norms.

## **10. PATTERN OF QUESTION PAPERS**

The question papers of Semester-End examinations of theory subjects shall be able to perform achievement testing of the students in an effective manner. The question paper shall be prepared

- (a) Covering all sections of the course syllabus and total marks from each module should be approximately same.
- (b) Unambiguous and free from any defects/errors
- (c) Emphasizing knowledge testing, problem solving & quantitative methods
- (d) Containing adequate data/other information on the problems assigned (e) having clear and complete instructions to the candidates.

Duration of Semester-End examinations will be 3 hours. The pattern of questions for theory subjects shall be as follows:

<b>Section</b>	<b>Total No of Questions</b>	<b>No. of Questions to be answered</b>	<b>Marks for each question</b>	<b>Total marks</b>
<b>A: Very Short/Objective answer questions</b>	10	10	1	10
<b>B: Short answer questions</b>	12	8	2	16
<b>C: Short Essays</b>	9	6	4	24

<b>D: Essays</b>	4	2	15	30
<b>Total</b>				80

And for Practical

<b>Marks Distribution</b>	<b>Total marks</b>
Theory/ Algorithm/Flow diagram	20
Implementation	30
Result/Output	10
Record	10
Viva	10
Total	80

## **11. CREDIT SYSTEM**

Each subject shall have a certain number of credits assigned to it depending upon the academic load and the nature and importance of the subject. The credit associated with each subject will be shown in the prescribed scheme and syllabi. Each course shall have an integer number of credits, which reflects its weightage.

- a) One Credit would mean equivalent of 15 periods of 60 minutes each, for theory, workshops/IT and tutorials;
- b) For internship/field work, the credit weightage for equivalent hours shall be  
50% of that for lectures/workshops;
- c) For self-learning, based on e-content or otherwise, the credit weightage for equivalent hours of study should be 50% or less of that for lectures/workshops.

## 12. INDIRECT GRADING SYSTEM

- Indirect Grading System based on a 7 -point scale is used to evaluate the performance of students.
- Each course is evaluated by assigning marks with a letter grade (A+, A, B, C, D, E or F) to that course by the method of indirect grading.
- An aggregate of E grade with 40 % of marks (after external and internal put together) is required in each course for a pass and also for awarding a degree/diploma.
- Appearance for Internal Assessment and End Semester Evaluation are compulsory and no grade shall be awarded to a candidate if she/he is absent for Internal Assessment / End Semester Evaluation or both.
- For a pass in each course 40% marks or E grade is necessary.
- A student who fails to secure a minimum grade for a pass in a course is permitted to write the examination along with the next batch.
- After the successful completion of a semester, Semester Grade Point Average (SGPA) of a student in that semester is calculated using the formula given below. For the successful completion of a semester, a student should pass all courses. However, a student is permitted to move to the next semester irrespective of SGPA obtained.
- SGPA of the student in that semester is calculated using the formula
$$\text{SGPA} = \frac{\text{Sum of the credit points of all courses in a semester}}{\text{Total credits in that semester}}$$
- The Cumulative Grade Point Average (CGPA) of the student is calculated at the end of a programme. The CGPA of a student determines the overall academic level of the student in a programme and is the criterion for ranking the students. CGPA can be calculated by the following
$$\text{CGPA} = \frac{\text{Total credit points obtained in six semesters}}{\text{Total credits acquired (180)}}$$
- SGPA and CGPA shall be rounded off to two decimal places. CGPA determines the broad academic level of the student in a programme and is the index for ranking students (in terms of grade points).



- An overall letter grade (Cumulative Grade) for the entire programme shall be awarded to a student depending on her/his CGPA (See Annexure 4 )

<b>Marks scored</b>	<b>Grade</b>	<b>Remarks</b>
90 and Above	A+	Outstanding
80 to 89	A	Excellent
70 to 79	B	Very Good
60 to 69	C	Good
50 to 59	D	Satisfactory
40 to 49	E	Adequate
Below 40	F	Failure

### **13. GRADE CARDS**

The University shall issue to the students grade/marks card (by online) on completion of each semester, which shall contain the following information:

- Name of University
- Title of B.Voc Programme
- Semester concerned
- Name and Register Number of student
- Code number, Title and Credits of each course opted in the semester
- Internal marks, External marks, total marks, Grade point (G) and Letter grade in each course in the semester
- The total credits, total credit points and SGPA in the semester (corrected to two decimal places)
- Percentage of total marks

The final Grade/mark Card issued at the end of the final semester shall contain the details of all courses taken during the entire programme including those taken over and above the prescribed minimum credits for obtaining the degree. However, as already mentioned, for the computation of CGPA only the best performed courses with maximum grade points alone shall be taken subject to the minimum credits requirements (180) for passing a specific degree. The final grade card shall show

the percentage of marks, CGPA (corrected to two decimal places) and the overall letter grade of a student for the entire programme. The final grade/mark card shall also include the grade points and letter grade of general course and skill developmental courses separately. This is to be done in a seven point indirect scale.

## **14. MONITORING CELLS/COMMITTEES**

### **EXAMINATION MONITORING CELL**

Head of the each institution should formulate an Examination Monitoring Cell at the institution for conducting and supervising all examinations including the internal examinations. The structure and their collective responsibilities will be as per the university norms.

### **GRIEVANCE CELL**

Each college should setup a Grievance Cell with at least four faculty members to look into grievances of the students, if any.

### **ANTI-RAGGING CELL**

Head of Institution shall take necessary steps to constitute anti-ragging committee and squad at the commencement of each academic year. The committee and the squad shall take effective steps as specified by the Honorable Supreme Court of India, to prevent ragging.

### **CLASS COMMITTEE**

Head of institution shall take necessary steps to form a class committee for each class at the start of classes of each semester. This class committee shall be in existence for the semester concerned. The class committee shall consist of the Head of Department, Staff Advisor of the class, a senior faculty member of the department, a faculty member from another department, and three student representatives (one of them should be a girl).

There should be at least two meetings of the class committee every semester; it shall be the responsibility of the Head of Department to convene these meetings. The decisions of the Class Committee shall be recorded in a register for further

reference. Each class committee will communicate its recommendations to the Head of Institution.

The responsibilities of the class committee are:

- a) To review periodically the progress and conduct of students in the class.
- b) To discuss any problems concerning any courses in the semester concerned.
- c) To identify weaker students of the class and suggest remedial measures.
- d) To review teaching effectiveness and coverage of syllabus.
- e) Discuss any other issue related to the students of the class.

## **15. COLLEGE TRANSFER**

College transfer is not allowed in any circumstances.

**B.Voc degree is equal to any degree approved by University of Calicut**

## **16. TRANSITORY PROVISION**

Notwithstanding anything contained in these regulations, the Vice-Chancellor has the power to provide by order that these regulations shall be applied to any program with such necessary modification.

# **BACHELOR OF VOCATION (SOFTWARE DEVELOPMENT)**

## **PROGRAMME STRUCTURE**

<b>SEMESTER I</b>									
C. No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
1.1	GEC1EG01	AO1 The Four Skills of Communication	4	20	80	100	4		4
1.2	GEC1ML02	MAL1A01(3) Malayalam - Bhashayum Sahithyavum-I	4	20	80	100	4		4
	GEC1HD02	(A07) – Communication skills in Hindi.							
1.3	GEC1DM03	(CA1C02) Discrete Mathematics	4	20	80	100	4		4
1.4	SDC1IT01	Fundamentals of Computer & Programming in C	5	20	80	100	5		5
1.5	SDC1IT02	Internet Programming	4	20	80	100	4		4
1.6	SDC1IT03 (P)	Programming in C - Lab	5	20	80	100		5	5
1.7	SDC1IT04 (P)	Internet Programming - Lab	4	20	80	100		4	4
<b>Semester I Total</b>			<b>30</b>			<b>700</b>	<b>21</b>	<b>9</b>	<b>30</b>
<b>SEMESTER II</b>									
C. No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
2.1	GEC2EG04	A02 Modern Prose & Drama	4	20	80	100	4		4
2.2	GEC2ML05	MAL2A01(4) Malayalam- Bhashayum Sahithyavum-II	4	20	80	100	4		4
	GEC2HD05	(A09) – Literature in Hindi							
2.3	GEC2NM06	A09(3) Basic Numeric Skills	4	20	80	100	4		4
2.4	SDC2IT05	Data Structures	4	20	80	100	4		4
2.5	SDC2IT06	Programming in Java	5	20	80	100		5	5
2.6	SDC2IT07(P)	Data Structures through Java - Lab	5	20	80	100		5	5
2.7	SDC2IT08 (Pr)	Mini Project	4	0	100	100		4	4
<b>Semester II Total</b>			<b>30</b>			<b>700</b>	<b>21</b>	<b>9</b>	<b>30</b>
<b>SEMESTER III</b>									
C.	Course Code	Course Name	Cred	Marks			Hrs/ wk		

No			it	Int	Ext	Tot	T	P	Tot
3.1	GEC3EG07	(A03) Inspiring Expressions	4	20	80	100	4		4
3.2	GEC3TW08	Technical Writing & SEO	4	20	80	100	4		4
3.3	GEC3ES09	(EWM1B01 ) Environmental Science	4	20	80	100	4		4
3.4	SDC3IT09	Basic Networking Concepts	4	20	80	100	4		4
3.5	SDC3IT10	Introduction to RDBMS and SQL	5	20	80	100	5		5
3.6	SDC3IT11(P)	Networking - Lab	4	20	80	100		4	4
3.7	SDC3IT12(P)	Database - Lab	5	20	80	100		5	5
<b>Semester III Total</b>			<b>30</b>			<b>700</b>	<b>21</b>	<b>9</b>	<b>30</b>
<b>SEMESTER IV</b>									
C. No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
4.1	GEC4EG10	(AO4) Readings on Society	4	20	80	100	4		4
4.2	GEC4SE11	Software Engineering Principles	4	20	80	100	4		4
4.3	GEC4ED12	(A14) Entrepreneurship Development	4	20	80	100	4		4
4.4	SDC4IT13	Operating Systems	4	20	80	100	4		4
4.5	SDC4IT14	Advanced Computer Networks	5	20	80	100	5		5
4.6	SDC4IT15(P)	Networking & OS - Lab	5	20	80	100		5	5
4.7	SDC4IT16 (Pr)	Project	4	0	100	100		4	4
<b>Semester IV Total</b>			<b>30</b>			<b>700</b>	<b>21</b>	<b>9</b>	<b>30</b>
<b>SEMESTER V</b>									
C. No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
5.1	GEC5HR13	BC5B09 Human Resource Management	4	20	80	100	4		4
5.2	SDC5IT17	.Net and Database Administration	4	20	80	100	4		4
5.3	GEC5LS15	(S04B.06) Life Skill Development	4	20	80	100	4		4

5.4	SDC5IT18 (E1/E2)	J2EE / Python Programming and Mobile Web	5	20	80	100	5		5
5.5	SDC5IT19 (E3/E4)	Mobile Software Development using Android / Programming Mobile Application	4	20	80	100	4		4
5.6	SDC5IT20(P)	.Net and Database - Lab	4	20	80	100		4	4
5.7	SDC5IT21(P)	Android and Python Programming - Lab	5	20	80	100		5	5
<b>Semester V Total</b>			<b>30</b>			<b>700</b>	<b>21</b>	<b>9</b>	<b>30</b>
<b>SEMESTER VI</b>									
C. No	Course Code	Course Name	Credit	Marks			Hr s		
				Int	Ext	Tot	T	P	Tot
6.1	SDC6IT22 (Pr)	Internship & Project (900 hrs.)	30	0	100	100		90 0	900 0
<b>Semester VI Total</b>			<b>30</b>			<b>100</b>			<b>900</b>
<b>Grant Total</b>			<b>180</b>			<b>360 0</b>			

**Semester 1**

<b>SEMESTER I</b>									
C. No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
1.1	GEC1EG01	AO1 The Four Skills of Communication	4	20	80	100	4		4
1.2	GEC1ML02 GEC1HD02	MAL1A01 (2) Malayalam- Bhashayum Sahithyavum-I (A07) – Communication skills in Hindi.	4	20	80	100	4		4
1.3	GEC1DM03	(CA1C02) Discrete Mathematics	4	20	80	100	4		4
1.4	SDC1IT01	Fundamentals of Computer &	5	20	80	100	5		5

		Programming in C							
1.5	SDC1IT02	Internet Programming	4	20	80	100	4		4
1.6	SDC1IT03 (P)	Programming in C - Lab	5	20	80	100		5	5
1.7	SDC1IT04 (P)	Internet Programming - Lab	4	20	80	100		4	4
<b>Semester I Total</b>			<b>30</b>			<b>700</b>	<b>21</b>	<b>9</b>	<b>30</b>

## Semester 1

### **GEC1EG01 (A01): The Four Skills for Communication**

Course No: 1.1

Course Code: GEC1EG01 - A01

Course Name: The Four Skills for Communication

Credits: 4

Hours: 60

### **A01: THE FOUR SKILLS FOR COMMUNICATION**

#### **1. OBJECTIVES OF THE COURSE**

To train learners in the Basic English Language Skills, word building, soft skills and effective communication

#### **2. COURSE DESCRIPTION**

Module 1: English for Communication	10 hours
Module 2: Primary Skills	15 hours
Module 3: Secondary Skills	15 hours
Module 4: Grammar	12 hours
Evaluation	8 hours
Total	60 hours

### **COURSE CODE A01**

COURSE CODE	A01
TITLE OF THE COURSE	<i>THE FOUR SKILLS FOR COMMUNICATION</i>
SEMESTER IN WHICH THE COURSE TO BE TAUGHT	1

NO. OF CREDITS	4
NO. OF CONTACT HOURS	60 (4 hours/ week)

### **Core Text**

#### **Module 1. English for Communication**

1. Communication and Language
2. English as a Global Language

#### **Module 2. Primary Skills**

##### **1. Listening**

1. Listening to a conversation
2. Listening to a speech
3. Listening to a lecture

##### **2. Speaking**

1. Greeting
2. Thanking
3. Requesting
4. Enquiring
5. Explaining
6. Reporting
7. Permission
8. Pronunciations of English
  - i. Introduction to phonetics
  - ii. Received Pronunciation
  - iii. Vowels and Consonants
  - iv. Syllables and Word Stress

#### **Module 3. Secondary Skills**

##### **1. Reading**

1. News reports
2. Charts
3. Advertisements
4. Official Letters/Documents
5. Online Content
6. Reading Poem "An October morning"
7. Reading Poem "Hawk Roosting"
8. Reading the essay, "How to escape from intellectual



rubbish”

9. Reading the essay “On the need for a quiet college ”

## **2. Writing**

1. Sentence
2. Paragraphs
3. Reports
4. Letters
5. Resumes and Cover Letters
6. Emails
7. Making Notes
8. Blogs
9. Punctuations

## **Module 4. Grammar**

1. Word Class
2. Subject – Verb Agreement
3. Tenses
4. Articles
5. Phrases ,Clauses and Sentences
6. Voices
7. Idioms

<b>Code</b>	<b>Title</b>	<b>Author</b>	<b>Publisher &amp; Year</b>
<b>A01</b>	<b><i>The Four Skills for Communication</i></b>	<b>Dr.Josh Sreedharan</b>	<b>Cambridge UP, 2014</b>

**GEC1ML/-----02 (Malayalam/Hindi)**

**GEC1ML02 Malayalam – MAL1A01 (3) Malayalam Bhashayum Sahithyavum-I**

Course No: 1.2  
Course Code: GEC1ML03- MAL1A01(3)  
Course Name: Malayalam – Bhashayum Sahithyavum-I  
Credits: 4  
Hours: 60

**LRP PROGRAMME (BSC COMPUTER SCIENCE, BCA, BMMC,  
BSC ELECTRONICS ETC.)**

**FIRST SEMESTER**

**Common Course in Hindi (Course No. 07)**

Course No: 1.2  
Course Code: GEC1HD02  
Course Name:A07 – Communication skills in Hindi  
Hours: 60

**COMMUNICATION SKILLS IN HINDI**

**No. of Credits: 1**

**No. of contact Hours: 90**

**Aim of the Course:**

To make the subjects well versed in Hindi so that they can speak Hindi fluently and use Hindi as a medium of communication in the fields of Commerce, Administration etc.

**Objectives of the Course:**

1. Learn Hindi for effective communication in different spheres of life – education, governance, media, business of mass communication etc. 2) Investigate problems and challenges of effective communication in Hindi 3) Correspondence in Hindi as a tool of communication 4) Translation as a tool of communication 5) Conversationalisation as a communication technique. .

**Course Outline**

**Module-I.** : Hindi as link language, national language, official language, Hindi in administration law and business, Hindi and mass communication.

**Module-II.:** Correspondence in , Technical terminology.

**Module-III.** : Communicative skills in different spheres of life, interviews

**Module-IV.** : Conversation as a communication technique.

**Prescribed text books**

1. Bolchal ki Hindi aur sanchar – Dr. Madhu Dhawan; Vani Prakashan, 21-A, Dariyaganj, New Delhi.
2. Ekanki saptak – Ed. Champa Srivasthav, Iokhbharathy Prakashan, Allahabad.

For Module-I- Hindi Bhasha : Sampark bhasha, Rashtra bhasha aur Rajbhasha, Karyalayi bhasha, Vidhik cyaparik aur vaniyyaik bhasha – Jansanchar ki bhasha (All from Bolchal ki Hindi aur Sanchar)

For Module-II : Paribhashik sabdavali – karyalayi aur Prasasanik prayukthiyam (1 to 50 wordds only)

Correspondence : Letter for Job

For Module-III- Baatcheet – khar mein, Pryatan mein, Rail yathra mein, Bank mein, Aspathal mein, Police station mein on telephone and Sakshatkar.

For Module IV – 1) Naye mehman by Uday Sankar Bhatt 2) Sookhi daal by Upendranath Ask 3)

Seema Rekha by Vishnu Prabhakar ( all from Ekank Saptak)

**GEC1MT02 – (CA1C02) Discrete Mathematics**

Course No: 1.3

Course Code: GEC1MT02

Course Name: (CA1C02) Discrete Mathematics.

Credits: 4

Hours: 60

**Aim of the Course:** To equip the students with basic principles of Discrete Mathematics.

**Objectives of the Course:**

- To learn the mathematical logic & Boolean Algebra
- To learn the basics of Groups & Rings

**Prerequisites:**

Background of the basic science at +2 level

**Course Outline**

**UNIT I (12T)**

Mathematical Logic: Propositions and logical operators, Truth tables, equivalence and implementation, Laws of logic, Quantifiers. Set theory: Introduction, concept of set of theory relation, types of relation, equivalence relation.

### **UNIT II (12T)**

Boolean Algebra and its properties, Algebra of propositions & examples, De-Morgan's Laws, Partial order relations, greatest lower bound , least upper bound, Algebra of electric circuits & its applications. Design of simple automatic control system

### **UNIT III (12T)**

Graph: Simple and multigraph, Incidence and degree, Isomorphism, Sub graphs and Union of graphs, connectedness, Walks, Paths and Circuits, Euler's Formula, Eulerian graph, Hamiltonian graph, Chromatic Graphs, Planer Graphs, Travelling salesman problem, Complete, Regular and Bipartite graphs, Directed Graphs

### **UNIT IV (12T)**

Trees: Properties of trees, pendant vertices. Centre of a tree, rooted and binary trees, spanning trees, spanning tree algorithms, fundamental. Circuits; spanning trees of a weighted graph: cutsets and cut-vertices; fundamental cutsets; connectivity and separativity; network. flows; max-flow min-cut theorem.

### **UNIT V (12T)**

Plan on graphs, dual graphs, Kuratowski's two graph, matrix representation of graphs, incidence matrix, directed graphs, digraphs, directed paths and connectedness. Euler digraphs **References:**

1. *Elements of Discrete Mathematics*, C. L. Liu, TMH Edition
2. *Discrete Mathematical Structures with applications to Computer Science*, J.K. Tremblay and R Manohar, McGraw Hill
3. *Discrete mathematical Structures*, Kolman, Busby, Ross, Pearson
4. *Graph theory*, Harry, F., Addison Wesley.
5. *Finite Mathematics*, S. Lipchutz, Schaum Series, MGH.
6. *Graph Theory*, Deo. N, PHI

## **SDC1IT01 - Fundamentals of Computer & Programming in C**

**Course No:** 1.4

**Course Code:** SDC1IT01

**Course Name:** Fundamentals of Computer and Programming in C

**Credits:** 5

**Hours:** 75

## **Objectives**

On completion of this course, the student should be able to:

- Understand the basics and background of computer system and its components.
- Understand the basics of computer programming
- Write programs for solving simple computational problems using C.

## **Prerequisites**

Background of the basic science at +2 level

## **Course Outline**

### **Unit 1 (15 Hours)**

Computer system concepts, Computer system characteristics, Capabilities and limitations, Evolution of Computers, Generations, Personal Computer (PCs) Functional Components & their Interconnections, evolution of PCs. Computer Languages - Machine Language, Assembly language, High Level Language. CPU - Functions, Components and organization, Memory- Characteristics, Memory hierarchy, Types. Input/output devices.

### **Unit 2 (15 Hours)**

Introduction: The problem solving aspect, Top-down design, Algorithms and flowcharts, Implementation of algorithms, Program verification, efficiency of algorithms. Introduction to C Programming, overview and importance of C, C Program Structure and Simple programs, Creation and Compilation of C Programs under Linux and Windows Platforms. Elements of C Language and Program constructs: Character Set, Tokens, Keywords and Identifier, Constants, Variables, Data types, Variable declaration and assignment of values, Symbolic constant definition. C-Operators, arithmetic expressions, evaluation of expressions and precedence, Type conversion in expressions, operator precedence and associativity, I/O operations.

### **Unit 3 (15 Hours)**

Decision making, Branching and Looping. Array & Strings - One dimensional array, two dimensional array and multi-dimensional array, strings and string manipulation functions.

#### **Unit 4 (15 Hours)**

The Concept of modularization and User defined functions-Multi-function Program, calling functions, various categories of functions, nesting of functions and recursion, functions and arrays, scope and life-time of variables in functions, multi-file programs. Structures & Union: structure definition, giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, structures within arrays, structures and functions, Unions, bit-fields.

#### **Unit 5 (15 Hours)**

Pointers and Files: Understanding pointers, accessing the address of a variable, declaring and initializing pointers, accessing a variable through its pointer, pointer expressions, pointer and arrays, pointer and character string, pointers and functions, pointers and structures, pointer to pointer - dynamic memory allocation. Files: Defining, Opening and closing files - I/O operations on files – error handling on files random access of files command line operations. Preprocessor directives: Macro substitution directives - simple macro, macros with arguments - nesting of macros, Compiler control directives.

#### **References:**

1. E. Balaguruswamy, *Programming in ANSI C*.
2. Yashwant Kanithkar, *Let us C*.
3. M Morris Mano, *Computer System Architecture*
4. William Stallings, *Computer Organization & Architecture*, PHI

### **SDC1IT02 – Internet Programming**

**Course No:** 1.5

**Course Code:** SDC1IT02

**Course Name:** Internet Programming

**Credits:** 4

Hours: 60

## Objectives

- On completion of this course, the student should be able to:
- Get an exposure to develop and design simple web applications  
Create interactive web applications having images and animations?

## Prerequisites

- Basic knowledge of Computer and Internet.

## Course Outline

### Unit 1 (12 Hours)

Introduction to Internet: What is Internet –Services provided by internet, Applications-telnet, HTTP-FTP, Email (POP, IMAP, SMTP) - TELNETUSENET-GOPHER-e commerce, video conferencing, e-business – Domain Names, DNS, WWW, URL, Browsers, Url, Search Engine, Web Servers.

### Unit 2 (12 Hours)

HTML: Introduction to HTML-Essential Tags-Adding Images-Color and Background of Web Pages-Lists and their Types- Linking to External Documents- Images maps, Creating Tables-Frames- Forms.

### Unit 3 (12 Hours)

Introduction to DHTML: CSS, JavaScript: Introduction to JavaScript –Basicsoperators, statements, Arrays, Functions Documents, Events and Event handlers, Writing JavaScript – Running JavaScript- Alert boxes-Accepting input from user-Creating Dynamic web pages using JavaScript- Relating JavaScript to DHTML. JQuery UI, Implementing JQuery UI, Responsive Design, JQuery Plugins.

### Unit 4 (12 Hours)

Dreamweaver: Interface choosing a workspace-document window, toolbars, the launcher panel & tool sets, Site Control-defining a site- file and folder management, Basics, adding text, align page elements, modifying page properties, Linking, image maps, Typography, Tables, Rollovers, Cascading Style Sheets, Code, Forms- form

objects, creating a form, creating a jump menu, Behaviours, Automation, history panel, Templates and Library Items, Inserting Media Objects.

### **Unit 5 (12 Hours)**

Photoshop: Fundamentals, Photoshop Interface Tools, Options, Layers, Channels, Actions Restoring and enhancing images, Text editing, special effects Web application and animation. Flash: Flash Environment and Tools, Symbols, Animation And Organizing Large Projects, Action scripting, And Interactivity, Adding Media And Publishing Flash Movies.

### **References:**

1. Steven Holzner, *HTML Black Book*, Dreamtech Press
2. Evan Bayross, *HTML, Java Script, DHTML, PERL, CGI*, BPB
3. Deitel & Nieto, *Internet and World Wide Web: How to Program*, Pearson Education.
4. Achyut S. Godbole & Atul Kahate, *Web Technologies – TCP/IP to Internet Application Architectures*, Tata McGraw Hill, 2003.
5. Jon Duckett, *Web Programming with HTML, XHTML, CSS*, Wrox Beginning
6. Jim Converse & Joyce Park, *PHP & MySQL Bible*, Wiley
7. Earle Castledine & Craig Sharkie, *JQuery: Novice to Ninja*
8. Brian Underdahl, *Macromedia Flash MX 2004: The Complete Reference*
9. Thomno A. Powell, *The Complete Reference HTML and XHTML*, fourth edition, Tata McGraw Hill, 2003.
10. Brad Dayley and DaNae Dayley, *Adobe Photoshop CS6 Bible*

## **SDC1IT03 (P) – Programming in C (Lab)**

**Course No:** 1.6

**Course Code:** SDC1EC03 (P)

**Course Name:** Programming in C (Lab)

**Credits:** 5

**Hours:** 75

### **Objectives**

On completion of this course, the student should be able to:

- Understand and practice the computer programming.



- Solve mathematical or scientific problems using C.

## **Prerequisites**

- Theoretical knowledge of C Programming Language.

## **Course Outline**

1. Simple C Programs
2. C Programs using Loops and decisions
3. Programs involving Arrays (Searching, sorting, merging etc.)
4. Two dimensional arrays (Matrix operations)
5. String Manipulations
6. Programs involving Structures (complex number operations record creation etc)
7. Programs involving Union
8. Programs involving functions and Recursion
9. Data manipulation using pointers
10. Pointers and array operation using pointers etc.
11. Pointers and structures
12. File operations (like create, copy delete etc)
13. Random access files
14. Command line arguments.

## **SDC1IT04 (P) – Internet Programming (Lab)**

**Course No:** 1.7

**Course Code:** SDC1EC04 (P)

**Course Name:** Internet Programming (Lab)

**Credits:** 4

**Hours:** 60

## Objectives

On completion of this course, the student should be able to

- Understand and Practice web development
- Get hands on interactive web, JavaScript and CSS
- Develop and design web application having images and animations

## Prerequisites

- Theoretical knowledge of Internet Programming.

## Course Outline

1. Web pages involving features of Html and CSS
2. Programs involving JavaScript
3. Programs involving features of DHTML, JQuery
4. Exercises involving improve quality of images
5. Exercises involving creating composite images
6. Exercises involving animation and organizing Layers
7. Web and animations using flash.

## Semester 2

C. No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
2.1	GEC2EG04	A02 Modern Prose & Drama	4	20	80	100	4		4
2.2	GEC2ML05	MAL2A01(4) Malayalam-Bhashayum Sahithyavum-II	4	20	80	100	4		4
	GEC2HD05	A07 – Literature in Hindi							
2.3	GEC2NM06	A09(3) Basic Numeric Skills	4	20	80	100	4		4

2.4	SDC2IT05	Data Structures	4	20	80	100	4		4
2.5	SDC2IT06	Programming in Java	5	20	80	100	5		5
2.6	SDC2IT07(P)	Data Structures through Java Lab	5	20	80	100		5	5
2.7	SDC2IT08(Pr)	Mini Project	4	0	100	100		4	4
<b>Semester II Total</b>			<b>30</b>			<b>700</b>	<b>21</b>	<b>9</b>	<b>30</b>

## GEC2EG04 - MODERN PROSE AND DRAMA

**Course Code:** GEC2EG04

**Course Name:** Modern Prose and Drama

**Credits:** 4

**Hours:** 60 ( 4 hrs per week)

On completion of this course, the student,

### . OBJECTIVE OF THE COURSE

- a. To introduce learners to representative English prose from different Cultural and geographical backgrounds
- b. To cultivate their tastes in drama
- c. To expose to logical and imaginative writing

### 3. COURSE DESCRIPTION

Module 1: Prose    30hours

Module 2: Drama    20 hours

Evaluation:        10 hours

COURSE CODE	A02
TITLE OF THE COURSE	<b>MODERN PROSE AND DRAMA</b>
SEMESTER IN WHICH THE COURSE TO BE TAUGHT	1
NO. OF CREDITS	4

NO. OF CONTACT HOURS	60 (4hrs/wk)
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Total: 60 hours

## **COURSE CODE A02**

### **A. Core Text**

#### **Module 1. Prose**

1. Gandhiji as a School Master : M.K.Gandhi
2. Women's Role in the National Movement : Subhash Chandra Bose
3. Martin Luther King and Africa: Chinua Achbe
4. Ambedkar's Constituent Assembly Speech: Dr.B.R.Ambedkar
5. Why I Want a Wife : Judy Brady
6. In Search of Sweet Peas: Ruskin Bond

#### **Module 2. Drama**

1. *Never Never Nest*: Cedric Mount
2. *Refund*: Fritz Karinthy
3. *Soul Gone Home* : Langston Hughes

<b>Code</b>	<b>Title</b>	<b>Author</b>	<b>Publisher &amp; Year</b>
A02	<i>Modern Prose and Drama</i>	Dr. Zainul Abid Kotta	Oxford UP, 2014

## **GEC2ML/-----02 (Malayalam/Hindi)**

### **GEC2ML02 Malayalam – MAL2A01 (4) Malayalam Bhashayum Sahithyavum-II**

Course No: 2.2

Course Code: GEC2ML03- MAL2A01(4)

Course Name: Malayalam – Bhashayum Sahithyavum-II

Credits: 4

Hours: 60

**GEC1HD05 : LRP PROGRAMME (BSC COMPUTER SCIENCE, BCA, BMMC, BSC ELECTRONICS ETC.)**

**GEC1HD05 : LRP PROGRAMME (BSC COMPUTER SCIENCE, BCA, BMMC, BSC ELECTRONICS ETC.)**

**SECOND SEMESTER**

**Common Course in Hindi (Course No. 09)**

Course No: 2.2

Course Code: GEC1HD05

Course Name: A07 – Communication skills in Hindi

Hours: 60

**LITERATURE IN HINDI**

**No. of Credits: 4**

**No. of contact Hours: 60**

**Aim of the Course:**

The aim of the course is to sensitize the students in the aesthetic, cultural and social aspects of literary appreciation and analysis.

**Objectives of the Course:**

3. Appreciation of literature using the best specimens provided as a reading list or anthology.
4. Practicing literary analysis and literary criticism using the best specimens.
5. Understanding Literary works as cultural and communicative events – different periods, genres and movements; Literature and Society.

**Course Outline**

**Module-I. :** Ancient hindi Poetry – A collection of selected ancient poems.

**Module-II.:** Modern Hindi poetry – A collection of poems of different poets of different periods representing different themes and styles.

**Module-III. : Hindi short stories** - A collection of short stories

**Prescribed text books**

1. Kavya Sargam – Ed: Santhosh Kumar Chaturvedi; Lokabharathi Prakashan Allahabad
2. Kahani Kunj – Ed: Dr. V. P. Amitabh; Govind Prakashan, Sardar Bazar, Mathura, U. P..

**Reading List - Required Reading.**

For Module-I- 1) First five dohas of Kabir 2) First two padas of Surdas

For Module-II : Manushyatha – Maithilisan Gupta 2) Taj – Sumitranandan pant 3) Fazal – Sarveswar Dayal Saxena 4) Bees Sall Baad -Dhoomil 5) naye ilake Mein –Arun Kamal 6) Aurathem – Uday Prakash 7) Sok Geeth – Kathyayani (all from Kavya Sargam)

For Module-III- 1) Apna Paraya – Jainendra Kumar 2) Aadmi ka Bacha – Yashpal 3) Bholaram ka jeev -Harisankar Parsai 4) Mavali – Mohan Rakesh 5) Dilli Mein Ek Mouth kamaleswar (all from Kahani Kunj)

## **GEC2NM06 – Basic Numerical Skills**

**Course No:** 2.3

**Course Code:** GEC2NM06

**Course Name:** A09(3)Basic Numerical Skills

**Credits:** 4

**Hours:** 60

### **Objectives**

On completion of this course, the student should be able to:

- Solve problems linear equations, metrics and progressions.
- Solve statistical problems and analyze data.

### **Prerequisites**

- Background of Mathematics in +2 level

### **Course Outline**

#### **Unit 1 (15 hours)**

Sets and set operation - Venn Diagrams - Elements of Co-ordinate system. Matrices, Fundamental ideas about matrices and their operational rules – Matrix multiplication - Inversion of square matrices of not more than 3rd order- solving system of simultaneous linear equations.

#### **Unit 2 (15 hours)**

Theory of equations: meaning, types of equations –simple linear and simultaneous equations (only two variables) eliminations and substitution method only. Quadratic

equation factorization and formula method ( $ax^2 + bx + c = 0$  form only) problems on business application.

### **Unit 3 (10 hours)**

Progressions: Arithmetic progressions finding the 'n'th term of an AP and also sum to 'n' terms of an AP. Insertion of Arithmetic means in given terms of AP and representation of

AP. Geometric progression: finding nth term of GP. Insertion of GMs in given GP and also representation of GP - Mathematics of Finance - simple and compound interest. (Simple problems only).

### **Unit 4 (10 hours)**

Meaning and Definitions of Statistics - Scope and Limitations – Statistical enquiries - Scope of the problem - Methods to be employed - types of enquiries - Presentation of data by Diagrammatic and Graphical Method - Formation of Frequency Distribution.

### **Unit 5 (10 hours)**

Measures of Central tendency - Arithmetic Mean, Median, Mode, Geometric and Harmonic mean, Measures of variation and standard, mean and quartile deviations – Skew ness and Kurtosis and Lorenz curve. Analysis of Time Series: Methods of Measuring - Trend and Seasonal variations - Index number - Unweighted indices - Consumers price and cost of living indices.

### **References**

1. Sundaresan and Jayaseelan, *An Introduction to Business Mathematics and Statistical Methods*
2. Dr. A K Arte & R V Prabhakar, *A textbook of Business Mathematics.*
3. Sanchethi and Kapoor, *Business Mathematics.*
4. Gupta S.P., *Statistical Methods*
5. Navaneethan P., *Business Mathematics*
6. R.S.N. Pillai, Mrs. Bhagavathi, *Statistics*
7. P.R. Vittal, *Business Mathematics and Statistics*

### **SDC2IT05 - Data Structures**

**Course No:** 2.4

**Course Code:** SDC2IT05

**Course Name:** Data Structures

**Credits:** 4

**Hours:** 60

## **Objectives**

On completion of this course, the student should be able to:

- Get an idea of various data structure and their implementations.

## **Prerequisites**

- Knowledge of C Programming.

## **Course Outline**

### **Unit 1 (12 Hours)**

Introduction to data structures - need for data structures, definition, categories of data structures, operations; Arrays storage representation of 1D, 2D and Multi-dimensional arrays, Sparse matrix, operations and Representation. Lists: Static and Dynamic Lists, Linked Lists, creation, operations on linked lists, records.

### **Unit 2 (12 Hours)**

Stacks & Queues: Stack - Definition, Operation on stack, Implementation using arrays and linked lists, Applications of Stacks, Function Calling, Recursion- direct & indirect recursion, Evaluation of arithmetic Expressions, Conversion of Expressions - Prefix, Infix and Postfix expressions. Queues: Definition, Implementations using arrays and linked lists, Circular queue, Dequeue, Priority queues, Applications of queues.

### **Unit 3 (12 Hours)**

Trees - Definition, Basic terminology, Binary trees, Representation of binary trees, Sequential representation of binary trees, Linked representation of binary trees, Traversals, Threaded binary tree. Binary Search Trees: Definition, Insertion, Deletion, Traversal and Searching BST, AVL Trees, Heap tree: Insertion and deletion (implementation not required).



#### **Unit 4 (12 Hours)**

Graphs: Graphs Terminologies, Representation of graphs, Adjacency Matrix, Adjacency List, Adjacency Multi-list, Graph search methods (BFS and DFS), Minimal Spanning Tree, Prims Algorithm and Kruskals Algorithms, Shortest path problem, Dijkstra Algorithm.

#### **Unit 5 (12 Hours)**

Searching and Sorting: Searching: Linear search, Binary search, Comparison of different methods, Hashing: Different hashing functions, Methods for collision handling. Sorting: Insertion sort, Bubble sort, Selection sort, Quick sort, Heap sort and Merge sort methods, Comparisons and Implementation.

#### **References:**

1. Robert Lafore, *Data Structures and Algorithms in Java*
2. William McAllister, *Data Structures and Algorithms Using Java*
3. Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft. *Data Structures and Algorithms*, Addison Wesley

### **SDC2IT06 - Programming in Java**

**Course No:** 2.5

**Course Code:** SDC2IT06

**Course Name:** Programming in Java

**Credits:** 5

**Hours:**75

#### **Objectives**

On completion of this course, the student should be able to

- Learn the OOPS Concept and use object oriented approach for solving real life problems
- Develop GUI based applications using java

#### **Prerequisites**

Knowledge of Programming

## **Course Outline**

### **Unit 1 (12 Hours)**

Introduction to OOPS - Basic principles of Object Orientation. Introduction to Java - History, Versioning, the Java Virtual Machine, Byte code, Features of Java, Language Components - Primitive Data Types, Comments, Keywords, variables, literals, Control structures - The for Statement, The if Statement, The while and do while Statements, The switch Statement, The break Statement, The continue Statement, Operators - Casts and Conversions, Arrays.

### **Unit 2 (15 Hours)**

Object-Oriented Programming - Defining New Data Types, introduction to Classes and methods, Constructors, Passing Objects to Methods, Method Overloading, Static and final, The this Reference, finalize, inner and nested classes. Inheritance: extends, Member access and inheritance, super keyword, Polymorphism-Dynamic method dispatch, method overriding. Abstract class, interface, Packages

### **Unit 3 (16 Hours)**

Exceptions, Threads & IO in Java - The File and Standard Streams, Stream classes and interfaces, Using Byte Streams and Character Streams, Threads: Threads vs. Processes, Creating Threads, Runnable interface, Thread Class, Inter thread communication, Synchronization. Exceptions: Basic of java Exception Handling, Hierarchy, Developing user defined Exception Classes

### **Unit 4 (16 Hours)**

Applets and AWT - Applet class, Types of applet, skeleton, Applet tag, passing parameters. Event Handling, Delegation event model, Event classes, Listeners, AWT classes and window fundamentals, Frames, Working with fonts, graphics and colours, AWT controls, layouts and Menus, Dialogue Boxes.

### **Unit 5 (16 Hours)**

Swing, Database and Sockets: Swings, Japplets and frames, Controls, icon, labels, Buttons, Textbox, combo box, Tables and Panes. JDBC: introduction, architecture,

Drivers, connections, statements, resultset and Meta data, Transactions. Sockets: Introduction to networking, InetAddress, URL, socket, server sockets, Datagram.

### **References:**

1. Java Complete Reference, Herbert Scheldt, Tata McGraw hill edition.
2. Programming in Java, E Balaguruswamy
3. Java Enterprise in a nutshell, David Flanagan, Jim Farley, William Crawford & Kris Mangnusson, OReill

## **SDC2IT07 (P) – Data Structure through Java (Lab)**

**Course No:** 2.6

**Course Code:** SDC2IT07 (P)

**Course Name:** Data Structure through Java (Lab)

**Credits:** 5

**Hours:** 75

### **Objectives**

On completion of this course, the student should be able to:

- Implement various data structures and to solve real life problems using data structures.
- Expertise in java programming.

### **Prerequisites**

- Knowledge of Data Structures
- Theoretical knowledge of Java Programming language.

### **Course Outline**

1. Simple Java programs like computing formulas expressions etc.
2. Programs involving loops and decisions like generating various series.
3. Programs involving class, inheritance and Interface.
4. Illustrate threads, packages and exception.

5. Illustrate usage of Applets like moving ball, face etc.
6. Programs involving AWT and events.
7. Swing applications and JDBC.
8. To implement array operations: insert and delete
9. To perform push and pop operations for stack
10. To perform insert and delete operations for linear queue.
11. To perform insert and delete operations for circular queue.
12. Implementing binary tree and traversals
13. Implementing binary search trees
14. Implementing sorting techniques like bubble sort, quick sort insertion sort etc.
15. To perform linear and binary searching, pattern matching etc.

### **SDC2IT08 (Pr) – Mini Project**

**Course No:** 2.7

**Course Code:** SDC2IT08 (Pr)

**Course Name:** Mini Project

**Credits:** 4

### **Objectives**

On completion of this course, the student should be able to:

- Develop software development skills
- Provide a solution for a real life situation.
- Get a chance to utilize and implement the skill acquired.

### **Prerequisites**

- Knowledge of Programming/Data structures/Web development.

## **Semester 3**

C. No	Course Code	Course Name	Credit	Marks			Hrs		
				Int	Ext	Tot	T	P	Tot
3.1	GEC3EG07	(A03) Inspiring Expressions	4	20	80	100	4		4
3.2	GEC3TW08	Technical Writing & SEO	4	20	80	100	4		4
3.3	GEC3ES09	(EWM1B01 ) Environmental Science	4	20	80	100	4		4
3.4	SDC3IT09	Basic Networking Concepts	4	20	80	100	4		4
3.5	SDC3IT10	Introduction to RDBMS and SQL	5	20	80	100	5		5
3.6	SDC3IT11(P)	Networking Lab	4	20	80	100		4	4
3.7	SDC3IT12(P)	Database Lab	5	20	80	100		5	5
<b>Semester III Total</b>			<b>30</b>			<b>700</b>	<b>21</b>	<b>9</b>	<b>30</b>

### GEC3EG07– (A03) INSPIRING EXPRESSIONS

COURSE CODE	A03
TITLE OF THE COURSE	<b><i>INSPIRING EXPRESSIONS</i></b>
SEMESTER IN WHICH THE COURSE TO BE TAUGHT	2
NO. OF CREDITS	4
NO. OF CONTACT HOURS	60 (4hrs/wk.)

1. OBJECTIVES OF THE COURSE
  - a. To acquaint the students with Short Stories
  - b. To cultivate their tastes in English Poetry
  - c. To expose to imaginative writing
  
2. COURSE OUTLINE
  1. Module 1. Poems 30Hrs
  2. Module 2 .Short Stories 20Hours
  3. Evaluation 10 hours

Total 60 Hours

**COURSE CODE A03**

**A. Core Text**

**Module 1. Poetry**

1. "On his Blindness" : John Milton
2. "To his Coy Mistress" : Andrew Marvel
3. "Ulysses": Lord Tennyson
4. "Ode to Nightingale": John Keats
5. "My Last Duchess": Robert Browning
6. "Indian Summer": Jayanth Mahapatra
7. "Journey of the Magi": T.S.Eliot

**Module 2. Short Stories**

1. The Luncheon : Somerset Maugham
2. Karma: Kushwant Singh
3. The Model Millionaire: Oscar Wilde

The Night the Ghost Got in : James

Code	Title	Author Prof. Muhammed Ayub Kallingal	Publisher & Year Black Swan, 2014
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Black Swan, 2014

1. Alan Evans, ITL ESL, Leslie Lamport et. al , Informatics Technology in action,

**GEC3TW08- Technical Writing & SEO**

**Course No:** 3.2

**Course Code:** GEC3TW08

**Course Name:** Technical Writing & SEO

**Credits:** 4

**Hours:** 60

**Objectives**

On completion of this course, the student should be able to:

Acquire the skills and knowledge for professional technical communication, web content writing, soft skill development and search engine optimization.

## **Prerequisites**

Basic communication skills in English.

## **Course Outline**

### **Unit 1(12 Hours)**

Basics of Technical Communication: Technical Communication - features; Distinction between General and Technical communication; Language as a tool of communication; Levels of communication: Interpersonal, Organizational, Mass communication; the flow of Communication: Downward, Upward, Lateral or Horizontal (Peer group); Barriers to Communication.

### **Unit 2 (12 Hours)**

Constituents of Technical Written Communication: Word formation, Prefix and Suffix; Synonyms and Antonyms; Homophones; One Word Substitution; Technical Terms; Paragraph Development: Techniques and Methods -Inductive, Deductive, Spatial, Linear, Chronological etc; The Art of Condensation- various steps.

### **Unit 3 (12 Hours)**

Soft skills: Communication skills, English-drafting, editing, grammar and composition, vocabulary, soft skills, Dreamweaver

### **Unit 4 (12 Hours)**

Forms of Technical Communication - Business Letters: Sales and Credit letters; Letter of Enquiry; Letter of Quotation, Order, Claim and Adjustment Letters; Memos, Notices, Circulars; Job application and Resumes. Reports: Types; Significance; Structure, Style & Writing of Reports. Technical Proposal; Parts; Types; Writing of Proposal; Significance, Master Service agreement Service Level agreement, managing website.

### **Unit 5 (12 Hours)**

SEO: Search Engines, Types of Search Engines, Search Engines working, rank websites based upon a search term, Directories, Difference between Search Engines and Directories Monitor performance of website in the search engines.

## References

1. Gerald J. Alred ,Charles T. Brusaw, Walter E. Oliu, *Handbook of Technical Writing*, Tenth Edition.
2. Gary Blake and Robert W. Bly, *The Elements of Technical Writing*, New York: Macmillan Publishers.
3. Hackos, JoAnn T., *Managing Your Documentation Projects*. Wiley, 1994.
4. R.L. Adams, *SEO Black Book - A Guide to the Search Engine Optimization Industry's Secrets* (The SEO Series 1).
5. Danny Dover, Erik Dafforn, *Search Engine Optimization (SEO) Secrets*.

## GEC3ES09- (EWM1B01)Environmental Science

Course No: 3.3

Course Code: GEC3ES09

Course Name: (EWM1B01) Environmental Science

Credits: 4

Hours: 60

## Objectives

On completion of this course, the student should be able to:

- Get a basic idea of environment, environmental resources and their importance.
- Learn the interrelationship between man, society & environment.
- Learn about ecosystem and biodiversity.
- Learn the impact of pollution and role of mankind to eradicate pollution.

## Prerequisites

Nil

## Course Outline

### Unit 1 (6 Hours)

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



### **Unit 2 (15 Hours)**

Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems. Forest resources: Use and over-exploitation, deforestation, case studies. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.

### **Unit 3 (12 Hours)**

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

### **Unit 4 (15 Hours)**

Biodiversity and its conservation: Introduction – Definition: genetic, species and ecosystem diversity. Biogeographical 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, 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 5 (12 Hours)**

Environmental Pollution: Definition, Cause, effects and control measures of various pollutions. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Social Issues and the environment. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Environment Protection Act. Public awareness, Human Population and the Environment, Role of Information Technology in Environment and human health.

**References:**

1. R Rajagopalan, *Environmental Studies*
2. B. B. Singh, *Objective Environmental Sciences*

**SDC3IT09 - Basic Networking Concepts**

**Course No:** 3.4

**Course Code:** SDC3IT09

**Course Name:** Basic Networking Concepts

**Credits:** 4

**Hours:** 60

**Objectives**

On completion of this course, the student should be able to  
Understand the basics of data communication and exchange  
Understand various techniques and rules for device communication

**Prerequisites**

Basic understanding of Data structures and digital Fundamentals.

**Course Outline**

**Unit 1 (12 Hours)**

Introduction to Computer networks, Topology, categories of networks, Internetwork, Internet, Network Models, Layered model, OSI and TCP/IP models, Transmission media, Wired and unwired media. Physical layer, Analog and Digital data, Periodic and A periodic signals, Composite signals, Digital data transmission, Transmission Modes - Analog Transmission, Multiplexing, Frequency division multiplexing, Time Division Multiplexing and Wave Division Multiplexing, Switching - Circuit switching, Packet Switching and Message Switching.

**Unit 2 (12 Hours)**

Data link layer, Error detection and correction, Types of errors, Single bit error and Burst error, Vertical redundancy check (VRC), longitudinal redundancy Check (LRC), Cyclic Redundancy Check (CRC), Error correction - Single bit error correction, Hamming code Data compression- Human code, data link control, Line discipline, Flow control, Error control, Multiple Access, Random Access, ALOHA, pure ALOHA and slotted ALOHA, Polling, Wired LANs, Ethernet - IEEE standards.

### **Unit 3 (12 Hours)**

Network layer, Networking and Internetworking devices - Repeaters, Bridges, Routers, Gateways, Logical addressing - IPv4 & IPv6 addresses, Network Address Translation (NAT), Internet protocols, internetworking, Datagram, Transition from IPv4 to IPv6, Address Mapping-Error reporting and multicasting - Delivery, Forwarding and Routing algorithms, Distance Vector Routing, Link State Routing, Multicast routing protocols, The Dijkstra Algorithm.

### **Unit 4 (12 Hours)**

Transport layer, Process-to-process Delivery: UDP, TCP and SCTP, Congestion control and Quality of Service, Application Layer, Domain Name Systems - Remote Login – Email -FTP, WWW, HTTP - Network management SNMP.

### **Unit 5 (12 Hours)**

Network Security – Basics of Cryptography- Digital Signature, Encryption, Decryption, Firewall, Data Translation- Compression – Mails Services – Directory services – File Transfer and Access Management Protocol (FTAM) – Common Management Information Protocol (CMIP).

### **References:**

1. Data Communications and Networking, Fourth Edition by Behrou A Forouzan, McGraw-Hill reprint, 2011.
2. Linux Administration - A Beginners Guide, Third Edition, Steven Graham and Steve Shah, Dream tech, 2003.

## **SDC3IT10 - Introduction to RDBMS and SQL**

**Course No:** 3.5

**Course Code:** SDC3IT10

**Course Name:** Introduction to RDBMS and SQL

Credits: 5

Hours: 75

## Objectives

On completion of this course, the student should be able to:

- Understand the need and working of Data Base and Data Base Management Systems.
- Learn the basic principles of database models and database design.
- Learn the basic of RDBMS and data manipulation using SQL.

## Prerequisites

- Knowledge of Data Structures and programming skills.

## Course Outline

### Unit 1 (12 Hours)

Introduction to database systems, File Systems Versus a DBMS, View of data – Data abstraction, View levels, Data models, Instances and Schemas, Data Independence, Database languages, Database architecture, Database users , Database administrator, Role of DBA . The Entity – Relationship (ER) model - Entity sets, Relationship sets, Attributes, Constraints, Mapping Cardinalities, Keys, ER diagrams, Weak entity sets, Strong entity sets.

### Unit 2 (12 Hours)

Relational Database Design - Relational Data Model: Relations, Domains and Attributes, Tuples, Keys. Integrity Rules, Relational Algebra and Operations, Relational Calculus and Domain Calculus. Normalization, need for normalization, functional dependency, Normal forms-First, Second, Third, BCNF, Multi valued functional dependency, Fourth and Fifth Normal forms. Decomposition and Transactions - ACID properties, States, Concurrent executions.

### Unit 3 (12 Hours)

Data Definition in SQL - Data types, Creation, Insertion, Viewing, Updation, Deletion of tables, modifying the structure of the tables, Renaming, Dropping of tables. Data

Constraints – I/O constraints, Primary key, foreign key, unique key constraints, ALTER TABLE command.

#### **Unit 4 (12 Hours)**

Database Manipulation in SQL - Computations done on table data - Select command, Logical operators, Range searching, Pattern matching, Grouping data from tables in SQL, GROUP BY, HAVING clauses, Joins – Joining multiple tables, Joining a table to itself. Views - Creation, Renaming the column of a view, destroys view, Granting and revoking permissions: Granting privileges, Object privileges, Revoking privileges

#### **Unit 5 (12 Hours)**

Program with SQL - Data types: Using set and select commands, procedural flow, if, if /else, while, goto, global variables, Security - Locks, types of locks, levels of locks. Cursors - Working with cursors, Error Handling, Developing stored procedures, create, alter and drop, passing and returning data to stored procedures, using stored procedures within queries, building user defined functions , creating and calling a scalar function , implementing triggers, creating triggers , multiple trigger interaction.

#### **References:**

1. Fundamentals of Database Systems, Elmasri & Navathe, Pearson Education.
2. Database System Concepts Abraham Silberschatz, Henry F Korth,S.
3. Introduction to Database Systems, CJ Date, Addison Wesley

### **SDC3IT11 (P) – Networking Lab**

**Course No:** 3.6

**Course Code:** SDC3IT11 (P)

**Course Name:** Networking Lab

**Credits:** 4

**Hours:** 60

### **Objectives**

On completion of this course, the student should be able to:

- Learn the basics of network administration Set up and configure LAN and DNS server.

## Prerequisites

- Theoretical knowledge of Computer Networking concept.

## Course Outline

1. Configuring network host, assigning IP address, setting hostname and configuring the Network Interface card.
2. Setup a LAN with more than two systems.
3. Setup a Domain Name Server (DNS)
4. Configure Printer/ Scanner Server.
5. Set up Internet services
  - i) File Transfer Protocol(FTP)
  - ii) Post Office Protocol 3 (POP3)
  - iii) Simple Mail Transfer Protocol (SMTP)

## SDC3IT12 (P) - Database Lab

**Course No:** 3.7

**Course Code:** SDC3IT12 (P)

**Course Name:** Database Lab

**Credits:** 5

**Hours:** 75

## Objectives

On completion of this course, the student should be able to:

- Learn data base administration
- Expertise SQL programming
  
- Theoretical knowledge in DBMS & SQL

## Prerequisites

*B.Voc Software Development (Academic Year 2014-15 Onwards)*

## Course Outline

1. Familiarization of the relational database: Data definition commands - CREATE, ALTER, DROP, Adding Constraints -Primary key, foreign key, unique key, check, not null.
2. Basic SQL queries - INSERT, SELECT, DELETE, UPDATE, Using multiple tables, ordering of rows using ORDER BY, GROUP BY option, Set operations using UNION, EXCEPT, INTERSECT, Substring Comparison using LIKE operator, IN, BETWEEN operator.
3. Complex Queries - Nested Queries, EXISTS and UNIQUE/DISTINCT functions, NULL values, Renaming of attributes and Joining of tables, Aggregate functions and grouping.
4. Programs involving views
5. Programs involving cursors
6. Programs involving triggers
7. Stored procedures, stored procedures with parameters.

## Semester 4

C. No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
4.1	GEC4EG10 (ENG4A06)	(AO4) Readings on Society	4	20	80	100	4		4
4.2	GEC4SE11	Software Engineering Principles	4	20	80	100	4		4
4.3	GEC4ED12	(A14) Entrepreneurship Development	4	20	80	100	4		4
4.4	SDC4IT13	Operating Systems	4	20	80	100	5		5
4.5	SDC4IT14	Advanced Computer Networks	5	20	80	100	5		4
4.6	SDC4IT15(P)	Networking & OS Lab	5	20	80	100		5	5
4.7	SDC4IT16 (Pr)	Project	4	0	100	100		4	4
<b>Semester IV Total</b>			<b>30</b>			<b>700</b>	<b>21</b>	<b>9</b>	<b>30</b>

**GEC4EG10 – (A04) Readings on Society**

COURSE CODE	A04
TITLE OF THE COURSE	<b>READINGS ON SOCIETY</b>
SEMESTER IN WHICH THE COURSE TO BE TAUGHT	4
<b>Objectives of the Course</b>	
NO. OF CREDITS	4
NO. OF CONTACT HOURS	60 (4hrs/wk)

- a. To introduce learners to various issues in the contemporary society
- b. To create an awareness of preservation of the environment and nature
- c. To inculcate the spirit of social life, values, duties and rights

**3. COURSE DESCRIPTION**

- Module 1: Social Issues 15 hours
- Module 2: Environment 15 hours
- Module 3: Gender 15 hours
- Module 4: Human Rights 10 hours
- Evaluation 5 hours
- Total 60 hours

**COURSE CODE A04**

**A. Core Text**

**Module 1. Social Issues**

- 1. The Social Cause of Economic Globalization : Vandana Siva
- 2. Unity Amidst Diversity: Dr. Rajendra Prasad

**Module 2. Environment**

- 1. Man and Nature in India: Dr. Salim Ali
- 2. Climatic Change in Human Strategy: E.K.Federov

**Module 3. Gender**



1. Widow: G. Venkat Chalam
2. More than 100 million Women Missing : Amartya Sen

#### **Module 4. Human Rights**

1. Stigma, Shame and Silence: Kalpana Jain
2. I am Happy, Don't you believe :Santhosh John Thooval

<b>Code</b>	<b>Title</b>	<b>Author</b>	<b>Publisher &amp;Year</b>
<b>A04</b>	<b><i>Readings on Society</i></b>	<b>Dr. K.P. Nandakumar</b>	<b>Cosmo, 2014</b>

### **GEC4SE11- Software Engineering Principles**

**Course No:** 4.2

**Course Code:** GEC4SE11

**Course Name:** Software Engineering Principles

**Credits:** 4

**Hours:** 60

#### **Objectives**

On completion of this course, the student should be able to:

- Learn engineering practices in Software development
- Learn various software development methodologies and practices.
- Learn various Evaluation methods in Software Development

#### **Prerequisites**

Background of Programming

#### **Course Outline**

#### **Unit 1(12 hours)**

Introduction to software Engineering, Software Components, Software Characteristics, Software Applications, Software engineering processes, Similarity and differences from conventional engineering processes Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, WIN-WIN spiral model, Formal method model, Time boxing model, Incremental model, Rapid Application Developmental(RAD) Model, Component based Development Model, Evolutionary development models, Iterative Enhancement Models.

### **Unit 2 (12 hours)**

Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modelling, Data flow Diagrams, Entity Relationship Diagrams, Decision Tables, SRS Document, IEEE Standards for SRS. Software Quality Assurance (SQA): Verification and Validation, SQA Plans, software quality Frameworks, ISO 9000 models.

### **Unit 3 (12 hours)**

Basic Concept of Software Design, Architectural Design: Software Architecture, Data Design, Architectural Styles, Mapping Requirements into Software Architecture Low Level Design: Modularization, Design Structure, Charts, Pseudo Codes, flow Charts, Coupling and Cohesion Measures ,Design strategies: Function Oriented Design, Object oriented Design, Top –Down and Bottom-UP design

### **Unit 4 (12 hours)**

Top-Down and Bottom-Up Testing Strategies: Test Drivers and Test Stubs, White Box Testing, Black Box Testing, Test Data Preparation Software as an entity, Need for Maintenance, Categories of maintenance: Preventive, Corrective and perfective maintenance, cost of maintenance, Software ReEngineering, Reverse Engineering.

### **Unit 5 (12 hours)**

Software configuration management Activities: Change control Process, Software Version Control, An Overview of CASE Tools Estimation: Cost, Efforts, Schedule/Duration, Constructive cost Models, Resource Allocation Models, Software Risk Analysis and Management.

### **References:**

1. R.S Pressman, *Software Engineering: A Practitioners Approach*, McGraw Hill.
2. James Peter, *Software Engineering, an Engineering Approach*, John Wiley.
3. Rajib Mall, *Fundamentals of Software Engineering*, PHI Publication.
4. K.K Agarwal and Yogesh Singh, *Software Engineering*, New Age International Publishers.
5. Carlo Ghezzi, M Jarayeri, D Manodrioli, *Fundamentals of Software Engineering*, PHI Publication.
6. Pankaj Jalote, *Software Engineering*, Narosa Publication.

7.

## **GEC4ED12 – A14 Entrepreneurship Development**

**Course No:** 4.3

**Course Code:** GEC4ED12

**Course Name:** A14 Entrepreneurship Development

**Credits:** 4

**Hours:** 60

### **Objectives**

On completion of this course the student should be able to

- Familiarize the students with the concept of entrepreneurship
- Identify and develop the entrepreneurial talents of students
- Generate innovative business ideas in emerging industrial scenario

### **Prerequisites**

Nil

### **Course Outline**

#### **Unit 1 (12 Hours)**

Entrepreneur and fundamentals of entrepreneurship: - entrepreneurial competencies characteristics of entrepreneurship – barriers to entrepreneurship, factors affecting entrepreneurial growth – role of entrepreneur in economic development – challenges of women entrepreneurs.

#### **Unit 2 (12 Hours)**

Micro small and medium enterprises – legal framework – licenses – role of promotional institutions with special reference to kinfra, kitco. msme & dics – concessions – incentives and subsidies.

### **Unit 3 (10 Hours)**

Project management – feasibility and viability analysis – technical – financial – network – appraisal and evaluation – project report preparation

### **Unit 4 (12 Hours)**

Identification of business opportunities in the context of Kerala – rate of Ed clubs – industrial policies – skill development for entrepreneurs. Business incubation – meaning – setting up of business incubation centres.

### **Unit 5 (14 Hours)**

Strategic importance HRM; objectives of HRM; challenges to HR professionals; role, Responsibilities and competencies of HR professionals; HR department operations; Human Resource Planning - objectives and process; human resource information system. Talent acquisition, recruitment and selection strategies, career planning and management, training and development, investment in training programme; executive development.

### **References**

1. S. L. Gupta, Arun Mittal, *Entrepreneurship Development*
2. K Ramachandran, *Entrepreneurship Development*

## **SDC4IT13 - Operating Systems**

**Course No:** 4.4

**Course Code:** SDC4IT13

**Course Name:** Operating Systems

**Credits:** 4

**Hours:** 60

### **Objectives**

On completion of this course, the student should be able to:

- Learn the basic concepts and functions of operating system Understand processes and its life cycle.
- Learn and understand various Memory and Scheduling Algorithms.
- Gain an overall idea about the latest developments in Operating Systems.

### **Prerequisites**

Knowledge of Data Structures

### **Course Outline**

#### **Unit 1 (12 Hours)**

Introduction to system software and Operating System: Objectives and functions, The evolution of Operating Systems, Serial Processing, simple batch systems, Multi programmed batch systems, time sharing systems, parallel systems, distributed systems, cloud computing, real time systems. Booting and POST

#### **Unit 2 (12 Hours)**

Processor Management: Functions, Definition of Process, Process States, Process Control Block, Operations on Process, Process Communication, Communication in Client server System, Basic concepts of threads. CPU Scheduling: Scheduling Criteria, Scheduling algorithms - FCFS, SJF, Priority, RR, Multilevel, Feedback Queue, Concurrency, Principles of Concurrency, Process synchronization, The Critical Section Problem Mutual exclusion, Semaphores, Messages . Dead lock, dead lock Prevention, dead lock detection, and dead lock avoidance

#### **Unit 3 (12 Hours)**

Memory Management: Address binding, Logical Vs Physical address space, Dynamic Loading, Dynamic Linking and Shared Libraries, Overlays, Swapping, Contiguous Memory allocation, Paging, Segmentation, Virtual memory, Demand paging, Page replacement, Working set principle, Thrashing.

#### **Unit 4 (12 Hours)**

File Management: File system, Functions, File directory, File system structure, File system design: Symbolic, Basic, Logical and Physical file system layers, File organization, File allocation, free space management, File protection and security. Device Management : Disk scheduling , Disk scheduling policies , Device management : Functions , Techniques for device management : Dedicated , Shared , Virtual , Spooling , Channels and Control units.

#### **Unit 5 (12 Hours)**

Case Study 1: UNIX: Kernel, Shells and Shell programming basics

Case Study 2: Mobile OS: Concepts

Case study 3: Microsoft Windows NT

### References:

1. Silberschatz, Galvin, Gagne, *Operating System Concepts*
2. Nutt G.J, *Operating Systems - A Modern Perspective*, Addison Wesley.
3. William Stallings, *Operating Systems, Internals and Design Principles*

## SDC4IT14 - Advanced Computer Networks

Course No: 4.5

Course Code: SDC4IT14

Course Name: Advanced Computer Networks

Credits: 5

Hours: 75

### Objectives

On completion of this course, the student should be able to:

- Get an outline on TCP/IP networks and its protocols.
- Learn about wireless, mobile network and associated technologies.

### Prerequisites

Knowledge of basic networking concepts

### Course Outline

#### Unit 1 (15 Hours)

Introduction - TCP/IP Architecture, TCP/IP addressing, services, FTP, SMTP, TFTP, SNMP, Network file system, domain name system.

#### Unit 2 (15 Hours)

Transport layer protocols, user datagram protocol, transmission control protocol, Inter process communications: File and record locking, pipes, FIFO's, stream and messages, message queues, semaphores.

### **Unit 3 (15 Hours)**

Sockets: Sockets system calls, reserved parts, stream pipes, socket option, asynchronous I/O, Sockets and signals.

### **Unit 4 (15 Hours)**

Wireless and Mobile networks – Wireless - Wireless links – characteristics – IEEE 802.11 wireless LANs (wi-fi) - Cellular Internet Access - mobility – principles – higher levels Principles - addressing and routing to mobile users - Mobile IP - Handling mobility in cellular networks - Mobility and higher layer protocols – Elements of a wireless network – comparison with wired networks - IEEE802.11 Wireless LAN - IEEE802.11a, b, g – architecture of IEEE802.11 – IEEE 802.11: multiple access - Collision Avoidance - RTS-CTS exchange – IEEE 802.11 frames – mobility within same subnet – 802.15 – personal area network.

### **Unit 5 (15 Hours)**

Emerging wireless and mobile technologies - Wireless Technology - Bluetooth, 3G, WiMax, Mobile Technology- GSM, CSMA, CDMA, GPRS, VSAT & GPS, Triband / Broadband Technology – NET, Leased lines, ISDN - 4G Systems: IPbased Mobile Telecommunications.

### **References:**

1. R. Stevens, *Unix Network Programming*, PHI 1998
2. J. Martin, *Unix Network Programming*, Prentice Hall, 1994.
3. D.E. Comer, *Internetworking with TCP/IP*, Vol. 1, Vol. 2, Vol. 3
4. *Principles, Protocols, and architecture*, PHI, 2000
5. Feit, *TCP/IP*, Mc Graw Hill, 1996
6. Stevens, *TCP/IP Illustrated*, Vol. 1-3, Addison Wesley, 1998
7. Ashok K. Thalukder, Hasan Ahmed, Rupa R. Yavagal, *Mobile Computing-Technology, Application and Service Creation*, Tata McGraw Hill, 2010.

## **SDC4IT15 (P) – Networking & OS Lab**

**Course No:** 4.6

**Course Code:** SDC4IT15 (P)

**Course Name:** Networking & OS Lab

**Credits:** 5

**Hours:** 75

## Objectives

On completion of this course, the student should be able to:

- Learn to set up intranet Services, wireless networks and web servers
- Get a basic idea of router configuration and LAN interconnections  
Learn socket programming.
- Learn Linux administration and shell scripting.

## Prerequisites

- Theoretical knowledge of Advanced computer networking
- Knowledge of Operating system concepts and Linux

## • Course Outline

### Networking Lab

1. Setting up Intranet Services
  - a. Network File System (NFS)
  - b. Network Information Service (NIS)
  - c. Dynamic Host Configuration Protocol(DHCP)
  - d. Samba printing
  - e. Web server.
2. Configuring PC as a network router
3. Setting up a wireless network
  - a. Infrastructure
  - b. Ad hoc
4. Network Address Translation (NAT) protocol - setup a fire wall on a router
5. Configuring a thin client configuration – Ubuntu LTSP



6. Configuring PC as a Remote Access Server (RAS)
7. Determination of IP address classes
8. IP address setting and Classless Inter-Domain Routing (CIDR)
9. Network protocol analysis – capturing and analyzing TCP, UDP, IP, ICMP and ARP packets.
10. Connecting two LANs using a router
11. Socket programming (Java/C/Python)

### **OS Lab**

1. Essential Linux commands, Processes in Linux, process fundamentals, connecting processes with pipes, redirecting input/output, Background processing, managing multiple processes, changing process priority, scheduling of processes. Batch commands, kill, ps, who, sleep. Printing commands, find, sort, touch, file, file processing commands - wc, cut, paste etc - mathematical commands - expr, factor etc. Creating and editing files with vi & joe editors
2. System administration - Common administrative tasks, identifying administrative files– configuration and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disabling of user's accounts, creating and mounting file system, checking and monitoring system performance - file security & Permissions, becoming super user using su. Getting system information with uname, host name, disk partitions & sizes, users, kernel - Backup and restore files, reconfiguration of hardware with kudzu, installing and removing packages with rpm command
3. Shell programming - Understanding shells, various types of shell available in Linux, shell programming in bash, Conditional and looping statements, case statement, parameter passing and arguments, Shell variables, system shell variables, shell keywords, Creating Shell programs for automating system tasks.
4. Simple filter commands – pr, head, tail, cut, paste, sort, uniq, tr - Filter using regular expressions – grep, egrep, and sed.
5. Configuring X-windows desktop - Redhat configuration - Xfree86, understanding XF86config file, starting & using X desktop. KDE & GNOME graphical interfaces, changing X settings

### **References:**

1. Cristopher Negus, *Red Hat Linux Bible*, Wiley Dreamtech India
2. Yeswant Kanethkar, *UNIX Shell Programming*, BPB

## SDC4IT16 (Pr) - Project

Course No: 4.7

Course Code: SDC4BS16 (Pr)

Course Name: Project

Credits: 4

Hours: 60

### Prerequisites

Software Engineering Concepts

Programming/ Web developing skills

The main aim of this project is to implement the theoretical knowledge gained from various areas to develop effective solutions to various real life computing problems. The course Project is one that involves practical work for understanding and solving problems in the field of computing. Students will select individually Commercial/Technical/Research Project based on Application Development Technologies learnt in previous semesters. Each student will have to prepare proper documentation consisting of Software Requirements

Specification (SRS), Modelling Techniques, Development Strategies, Implementation and Testing Strategies. Student may use any Design Methodologies such as SSAD, OOAD and UML, etc. The project work will be presented by students using Power Point Presentation Tool to the panel of Examiners, along with a live demonstration of the project.

C. No	Course Code	Course Name	Credit	Marks			Hrs/wk		
				Int	Ext	Tot	T	P	Tot
5.1	GEC5HR13	BC5B09 Human Resource Management	4	20	80	100	4		4
5.2	SDC5IT17	.Net and Database Administrator	4	20	80	100	4		4
5.3	GEC5LS15	(S04B.06) Life Skill Development	4	20	80	100	4		4
5.4	SDC5IT18 (E1/E2)	Python Programming and Mobile Web / J2EE	4	20	80	100	4		4
5.5	SDC5IT19	Mobile Software	5	20	80	100	5		5

(E3/E4)	Development using Android / Programming Mobile Application							
5.6	SDC5IT20	Net and Database - Lab	4	20	80	100		4 4
5.7	SDC5IT21(P)	Android and Python Programming	5	20	80	100		5 5
<b>Semester V Total</b>			<b>30</b>			<b>700</b>	<b>21 9</b>	<b>30</b>

**Semester 5**

**GEC5HR13 (P) – BC5B09 HUMAN RESOURCE MANAGEMENT**

Course No: 5.1

Course Code: GEC5HR13 (P)

Course Name: BC5B09 HUMAN RESOURCE MANAGEMENT

Credits: 4

Hours: 60

**Lecture Hours per week: 4      Credits: 4**

Objectives:

To familiarize the students with the different aspects of managing Human Resource in the Organization and  
To equip the students with appropriate knowledge and skills required for acquisition, development and retention of Human Resources.

Module I

Introduction – Human Resource Management (HRM) – Concept, Scope, Importance, Objectives & functions of HRM. Personal Management Vs. Human Resource Management: - HR Planning, Recruitment and selection: Manpower planning – concept and objectives, process of manpower planning, methods of manpower planning, conventional vs. strategic planning – Recruitment : meaning, Sources of Recruitment, Modern trends in Recruitment. Selection:

– Meaning and Importance- Steps in selection procedure. Interviews – Types of Interviews – Test – types of test, induction, Job changes – transfer, promotions, demotions, separations

20 Hours

Module II

Human Resource Development:- Training – Concept – Need for Training – objectives – Approaches - Methods of Training. – Training Environment – Areas of training – Training Evaluation - Executive Developments – Process and Techniques.

15Hours

Module III

Performance Appraisal and Career planning: – need and importance – objectives – process – methods and problems of Performance appraisal, concept of career planning - features – methods – uses – career development

15 Hours

Module IV

Compensation Management: Compensation Planning – objectives – wage systems – Factors influencing wage system – components of employee remuneration – Basic wage – Dearness Allowance – Bonus - Fringe benefits and incentives.

15 Hours

Module V

Grievance Redressal: Grievance – meaning and causes of grievances, Procedure of grievances handling – Absenteeism -- Discipline –Essentials of good discipline system

10 Hours

**Reference Books:**

1. Bernardin, John H: Human Resource Management, Tata McGraw Hill, New Delhi 2004.
2. Arthur M, Career Theory Handbook, Prentice Hall Inc, Englewood Cliff.
3. Belkaoui, A.R. and Belkaoui ,JM, Human Resource Valuation: A Guide to Strategies and Techniques, Quarum Books, Greenwood, 1995.

4. Dale, B, Total Quality and Human Resources: An Executive Guide, Blackwell, Oxford.
5. Greenhaus, J.H., Career Management, Dryden, New York.
6. Mabey, C and Salama, G., Strategic Human Resource Management, Blackwell, Oxford.
7. Aswathappa. K, Human Resource Management
8. Subba Rao, Human Resources Management.
9. Michael Porter, HRM and Human Relations.
10. Garry Dessler and Biju Varkkey, Human Resource Management, Pearson 2012
11. Amstrong's Hand book of Human Resource Management, Kogan-Page, 2012

## **SDC5IT17 - .Net and Database Administrator**

**Course No:** 5.5

**Course Code:** SDC5IT17 (E2)

**Course Name:** **.Net and Database Administrator**

**Credits:** 4

**Hours:** 60

### **Objectives**

On completion of this course, the student should be able to:

Learn the basic of .NET technology Expertise web development.

### **Prerequisites**

Basic concepts of OOPS, RDBMS and Programming skills.

### **Course Outline**

#### **Unit 1 (15 Hours)**

The origins of the .NET technology .net framework, Features of .net, architectures of C#.net. Introduction to visual studio,.net IDE interface and event driven programming. The common language runtime, The Just-In-Time Compiler visual

studio, .NET Framework class library introduction.NET languages, benefits of the .NET approach, C# and .NET.

### **Unit 2 (15 Hours)**

Basic classes, declarations, conditionals, loops, arrays, strings, enumerations, Windows Forms and Controls, Menus, Image List, Tree Views, List Views, Toolbars, Status Bar and Progress bars. Object Oriented Programming in c#.NET, Class and Object, Properties, methods and events. Constructors and Destructors, Method overloading, Inheritance,

### **Unit 3 (15 Hours)**

Database: Connected and disconnected mechanism, Connection Objects, Command Objects, Data Adapters, Dataset Class, Data binding with controls like Text Boxes, List Boxes, Data grid. Exception, structured exception handling using try, catch and final statements, and user defined exception

### **Unit 4 (15 Hours)**

Oracle Database Architecture - Preparing the Database Environment and Creating Database - Managing the Oracle Instance - Configuring the Oracle Network Environment - Managing Database Storage Structures - Administering User Security - Managing Data and Concurrency - Managing Undo Data Module - Implementing Oracle Database Security - Database Maintenance - Performance Management - Intelligent Infrastructure Enhancements - Backup and Recovery Concepts - Performing Database Backups - Performing Database Recovery - Moving Data Module

### **Unit 5 (15 Hours)**

Database Architecture and ASM - Configuring for Recoverability - Using the RMAN Recovery Catalog - Configuring Backup Specifications - Using RMAN to Create Backups and recover - Performing User-Managed Backup and Recovery - Using RMAN to Duplicate a Database - Performing Table space Point-in-Time Recovery - Monitoring and Tuning RMAN Module - Using Flashback Technology - Diagnosing the Database - Managing Memory - Managing Database Performance - Space Management - Managing Resources - Automating Tasks with the Scheduler - Administering the Scheduler.

### **References:**

1. *.Net Framework Essentials* .3<sup>rd</sup> Edition (O'Reilly)
2. *Beginning with C#.Net*. Wroax publications

## **GEC5LS15 - (S04 B.06) Life Skill Education & Presentation Skill**

**Course No:** 5.3

**Course Code:** GEC5LS15

**Course Name:** (S04B.06 ) Life Skill Education & Presentation Skill

**Credits:** 4

**Hours:** 60

### **Objectives**

On completion of this course, the student should be able to:

Develop intra-personal, inter-personal, critical thinking, decision making and communication skills.

Establish self-management and help to maintain work life balance.

Get an insight to career planning and development

### **Prerequisites**

Nil

### **Course Outline**

#### **Unit 1 (12 Hours)**

Introduction to life skill education, definition, components, pillars of learning, need for life skill training, approaches - critical thinking skills/decision making skills, interpersonal/communication skills, criteria for using life skills.

#### **Unit 2 (12 Hours)**

Communication skills, communication, definition , components- sender, message, channel , receiver, feedback, types of communication, effective interpersonal communication, barriers, communication noise, listening, ways to improve

interpersonal communication, effective public speaking interview, group discussion etc

### **Unit 3 (12 Hours)**

Career planning, career planning steps, choosing a career, career development, career guidance and career guidance centre, need and importance of career guidance, career guidance centre and sources, making a career decision, preparing a resume and tips

### **Unit 4 (12 Hours)**

Self management, self esteem, definitions, practice self acceptance, practice self acceptance characteristics of people with high self-esteem, low self esteem, characteristics and causes, self-esteem building, self awareness importance, develop self awareness, self control, developing self control, emotional intelligence or emotional quotient, emotional quotient , two aspects of emotional intelligence, five domains of emotional eq or ei, social intelligence, coping with emotions, emotional intelligence,

### **Unit 5 (12 Hours)**

Stress and strain: concept of stress, meaning and definition of stress, types of stress, major symptoms of stress, manage everyday stress. strain-mental strain, causes of strain, conflict, conflict resolution, understanding conflict in relationships, emotional awareness, managing and resolving conflict, stages of healthy conflict resolution, styles of conflict resolution, styles of dealing with conflict, developing positive thinking, positive and negative self-talk, better selftalk, impacts , assertiveness, behaviour , importance of assertive behaviour.

### **References:**

1. E Wachira, *Essential Life Skills*

## **SDC5IT18 (E1/E2) - Elective 1**

### **E1. Python Programming and Mobile Web**

**Course No:** 5.5

**Course Code:** SDC5IT18 (E1)

**Course Name:** Elective 1 - Python Programming and Mobile Web



Credits: 5

Hours: 75

## Objectives

On **completion of this course**, the student should be able to:

- Expertise Python Programming
- Learn web based applications for mobile devices

## Prerequisites

- Basic Knowledge of Programming
- Knowledge of HTML and JavaScript

## Course Outline

### Unit 1 (12 Hours)

Introduction to Python - Features, Python interpreter and Idle, data types, strings, variables, operators and expressions, control flow tools, loops, break, continue, data structures, Input and Output, functions.

### Unit 2 (12 Hours)

Introduction to Object Oriented Concepts in Python- Class, class variable, data member, function overloading, instance variable, inheritance, instance, instantiation, method, object, operator overloading, exception handling.

### Unit 3 (12 Hours)

Introduction to Mobile Web- Introduction to HTML, Basic formatting tags: heading, paragraph, underline break, bold, italic, underline, superscript, subscript, font and image. Different attributes like align, color, bgcolor, font face, border, size. Navigation Links using anchor tag: internal, external ,mail and image links. Lists: ordered, unordered and definition, Table tag, HTML Form controls: form, text, password, textarea, button, checkbox, radio button, select box, hidden controls, Frameset and frames.

### Unit 4 (12 Hours)

Server side programming using Python- Server side scripting - CGI - role of Web server – XAMMPP /WAMP (choose any one of these servers) – Python server side

script - XAMPP/WAMP – capturing form data – validation – processing data – exchange of data between form and server .

### **Unit 5 (12 Hours)**

Python- MySQLdb integration: Features of MySQL, data types, Introduction to SQL commands-SELECT, DELETE, UPDATE, INSERT. Python functions for MySQLdb operations – database connection, selection, query, fetching results- Insertion and Deletion of data using Python- Displaying data from MYSQL in webpage.

### **References:**

1. David M.Beazly, *Python Essential Reference*
2. Mark Lutz, *Programming Python*

## **E2. J2EE**

**Course No:** 5.5

**Course Code:** SDC5IT17 (E3)

**Course Name:** Elective 2 - J2EE

**Credits:** 5

**Hours:** 75

### **Objectives**

On completion of this course, the student should be able to:

Learn distributed enterprise applications using java.

Learn web development and server side programming using java Learn database managements and spring frameworks.

### **Prerequisites**

Knowledge of OOPS concept

Basics of Java Programming.

### **Course Outline**

**Unit 1 (12 Hours)**

Core Java EE: Platform Overview, Distributed Multi tiered Applications, Web & Business Components, services & types, Java EE Application Assembly & Deployment – Packaging Applications, Java EE modules, Getting Started with Web Applications, Model View Controller (MVC) Architecture.

Application deployment-Web application development and deployment Steps, Configuring Web application – Web application deployment descriptor (web.xml file)

**Unit 2 (12 Hours)**

SERVLETS: Servlet Overview, Life cycle of Servlet, Handling Client HTTP Request & Server HTTP Response, Initializing Parameters & ServletContext, Initializing a Servlet, initialization Parameters, ServletContext Attributes (Context binder), Session Management, Request Dispatcher & Redirecting.

**Unit 3 (12 Hours)**

JSP: Overview of JSP, JSP Architecture & life cycle, Components of Java Server Pages, Implicit Objects & Standard JSP Tags, Scope of JSP objects.

**Unit 4 (12 Hours)**

JDBC: JDBC Overview & Architecture, Step By Step Usage of JDBC API, Connecting to Database in Java, Prepared Statement & JDBC Transactions. Developing Web Application with MySQL Database by implementing Java Beans, DAO's & MVC Architecture.

**Unit 5 (12 Hours)**

Hibernate: Introduction to Hibernate, ORM Overview, Hibernate Environment, Hibernate Architecture & API, Hibernate Configuration, Hibernate Sessions, Persistent Class & Mapping Files, Building Hibernate application, Hibernate Query Language (HQL), Hibernate O/R Mappings – Collection & Association Mappings(Many-to-One, One-to-One, One-to-Many,Many-to-Many), Implementing Hibernate in Java Web Applications using Netbeans with MySQL.

**Unit 6 (15 Hours)**

Spring: Introduction to Spring Framework Architecture,Bean Definition, Bean Scopes & Bean Definition Inheritance, Spring IoC Containers, Understanding

inversion of control (IoC) – Dependency Injection (DI), Spring Setter Injection, Spring Constructor Injection, IoC in Action, Architecture of Spring Web MVC Framework, Spring MVC Getting Started – constructing web MVC application using Spring Framework, AbstractController in Spring MVC, Spring MVC Controllers hierarchy, SimpleFormController, Spring DAO design pattern, Building Spring MVC Framework Applications by using Netbeans.

## References

1. James Keogh, *J2EE: The complete Reference*

## SDC5IT18 (E3/E4) – Elective 2

### (E3) Mobile Software Development using Android

Course No: 5.6

Course Code: SDC5IT18 (E4)

Course Name: Elective 2

Credits: 4

Hours: 60

### Objectives

On completion of this course, the student should be able to

- Develop mobile applications with Google Android Platform
- Learn more about mobile operating system
- Get an insight to cross-platform mobile app development

### Prerequisites

- Basic concepts of Operating Systems
- Programming skills in core Java

### Course Outline

#### Unit 1 (15 Hours)

Introduction & environment set up: Introduction to object oriented programming and java basics, introduction to android and smart phones, Android Architecture & Virtual Machine, Mobile Technology terminologies, setting up the environment, Setting up Emulators, android fundamentals - Activities and Applications Activity Life Cycles Activity Stacks, Activity States, introduction to manifest, resources & R.java , assets, Values – strings.xml

### **Unit 2 (15 Hours)**

Basic UI design: Form widgets, views, Layouts & Drawable Resources - XML Layouts, Linear Layouts, Relative layouts, Table Layouts, android Widgets, UI XML Specifications Events, Bundles & Intents- Explicit Intents Implicit Intents Event Broadcasting with Intents Event Reception with Broadcast Receivers, Adapters and Data Binding

### **Unit 3 (15 Hours)**

Files, Content Providers, and Databases: Saving and Loading Files, SQLite Databases Android Database Design Exposing Access to a Data Source through a Content Provider Content Provider Registration Native Content Providers, Android Debug Bridge (adb) tool, Linkify

### **Unit 4 (15 Hours)**

Custom components, Threads & multimedia: Adapters and Widgets , Notifications , Custom components Threads running on UI thread, Worker thread Handlers & Runnable AsyncTask(in detail), Playing Audio and Video, Recording Audio and Video, Using the Camera to Take and Process Pictures

### **Unit 5 (15 Hours)**

Networking & Location based services: Live Folders, Using SD cards – Reading and writing, XML Parsing JSON Parsing Including external libraries in our application, Map-Based Activities, Maps via intent and Map Activity GPS, Location based Services configuration, Geo-coding, Accessing Phone services (Call, SMS, MMS) Network connectivity services, Using Wi-Fi & Bluetooth Action bar tabs and custom views on Action bars. Introduction to cross-platform application development tools like ruby on rail, phone gap etc.

### **References**

1. Beginning Android 4, Onur Cinar, Apress Publication

2. Professional Android 4 Application Development, Reto Meier

**Course No:** 5.6

**Course Code:** SDC5IT20 (E5)

**Course Name:** Elective 2

**Credits:** 4

**Hours:** 60

## **Objectives**

On completion of this course, the student should be able to:

Develop mobile applications with HTML5 and Angular JS

Develop mobile web and applications that runs on multiple platforms.

## **Prerequisites**

Basic knowledge about HTML, CSS and JavaScript.

Background of Programming.

## **Course Outline**

### **Unit 1 (15 Hours)**

HTML5 & CSS3: Introduction to HTML5, HTML5 new elements, canvas, video and audio, web storage, geo-location, HTML5 APIs, CSS3- Backgrounds, border, color, fonts, multi column layout, selectors, contents

### **Unit 2 (15 Hours)**

AngularJS: AngularJS architecture overview, Get Setup Data Binding-Wiring up a controller, Binding, Iteration, Forms binding and validation, Build: A two-way bound form with validation. Services and DI- Overview of the built-in AngularJS services, angular's \$http and \$resource services, Promises, Service registration and injection, Using services to build a service, Injecting services, Build: Create a twitter search service.

### **Unit 3 (15 Hours)**

Templates and Routing- Linking and images, The routing API, PushState, hasbangs and SEO, Build: Using templates with iteration. Directives- Simple directives, Using templates, Working with controllers, Transclusion, Directive scope and isolate scope, Build: Tweet Directive. Advanced Topics-How to avoid polluting the global namespace, Using modules, Some AngularJS best practices, Using \$watch, \$digest, \$apply, AngularJS events

#### **Unit 4 (15 Hours)**

PhoneGap: Installing PhoneGap, Building & Debugging on multiple Platforms, HTML 5 APIs, CSS transition & animation.

#### **References**

1. AngularJS , Green, Brad; Seshadri, Shyam,. O'Reilly Media.
2. Mastering Web Application Development with AngularJS, Kozlowski, Pawel; Darwin, Peter Bacon.
3. Murach's HTML5 and CSS3: Training and Reference by Zak Ruvalcaba, Mike Murach & Associates
4. Beginning PhoneGap Mobile Web Framework for JavaScript and HTML5, Apress,

### **SDC5IT20 (P) - Net and Database - Lab**

**Course No:** 5.6

**Course Code:** SDC5IT20 (P)

**Course Name:** .Net and Database - Lab

**Credits:** 4

**Hours:** 60

#### **Objectives**

On completion of this course, the student should be able to:

Develop applications with C#.Net and ASP.Net

Develop mobile web and applications that runs on multiple platforms.

## **Prerequisites**

Basic knowledge about .Net Technology.

Background of Programming.

## **Course Outline**

### **C# - LAB Programs**

1. Simple C# programs
2. Create and populate Windows Forms
3. Create and use user controls in a Windows Forms application
4. Create menus in a Windows Forms applications
5. Add code to form and control event procedures sin a Windows Forms applications.
6. Validate user input in a Windows Forms applications
7. Bind Windows Forms applications to various data sources by using Microsoft ADO.NET
8. Debug a Windows Form Application (try/catch)

### **Database - Lab Programs**

1. Preparing the Database Environment and Creating Database
2. Network Configuration
3. User Manager and configuration
4. Reporting and managing performance
5. Performing Database backup
6. Managing and Scheduling tasks
7. Configure oracle for recovery
8. Backup configuration
9. RMAN for backup and recovery
10. Monitoring using RMAN
11. Flashback Technology



## **SDC5IT21 (P) - Elective Lab**

### **1. Android & Python Programming**

**Course No:** 5.7

**Course Code:** SDC5IT21 (P)

**Course Name:** Elective Lab

**Credits:** 5

**Hours:** 75

## **Objectives**

On completion of this course, the student should be able to:

Practice and implement the theoretical knowledge acquired in the selected elective course.

Develop industry standard applications with real life implications.

## **Prerequisites**

## **Course Outline**

### **Android**

1. Creating Activities for Menu Items and Parsing XML Files
2. Writing Multi-Threaded Applications using Async Task
3. Using Web View and Using the Network
4. Using Audio Functions in Android
5. Graphics Support in Android
6. Preferences and Content Providers
7. Preference Activity
8. Creating Menus
9. Location Services and Google Maps in Android
10. Obtaining User Location

11. Obtaining a Maps API Key
12. Creating Status Bar Notifications
13. Data Storage
14. Simulating Sensors

### **Python:**

1. Programs using Loops and decisions
2. Programs for constants and String Manipulations
3. Programs for Functions, arrays , tuple, list, Dictionary
4. Programs for Sessions and request handling
5. Programs for Modules, Input-Output, Exception Handling, OOPs concept
6. Programs for Database management, Multithreading Installation of WAMP/XAMPP Server, MySQL db, and Python MySQL interface
7. Exchange of data between web page and server
8. Storage /Retrieval/Updation of form data in MySQL DB

## **2. J2EE Programming**

1. Practical demonstration on Distributed Multi tiered Applications, Web & Business Components,
2. Handling Client HTTP Request & Server HTTP Response,
3. Initializing Parameters & ServletContext.
4. Initializing a Servlet, Parameters,
5. Programme for ServletContext Attributes (Context binder), Session Management,
6. Programme for Request Dispatcher & Redirecting.
7. Programme on Components of Java Server Pages, Implicit Objects & Standard JSP Tags, Scope of JSP objects
8. Step By Step Usage of JDBC API
9. Connecting to Database in Java.
10. Developing Web Application with MySQL Database by implementing Java Beans, DAO's & MVC Architecture

11. Implementing Hibernate in Java Web Applications using Netbeans with MySQL
12. Building Spring MVC Framework Applications by using Netbeans

### **3. Programming Mobile Application**

1. Practical sessions on Html5 & css3
2. Programme for Data Binding-Wiring up a controller, Binding, Iteration, Forms binding and validation, Build: A two-way bound form with validation
3. Programme for Angular js Services
4. Programme for Templates and Routing Directives- Simple directives, Using templates, Working with controllers, Transclusion, Directive scope and isolate scope, Build: Tweet Directive
5. JavaScript based object oriented programme on Advanced Angular JS
6. Installing Phone Gap, Building & Debugging on multiple Platforms

### **Presentation Skill/Seminar**

#### **Course Outline**

Each student shall present a seminar on any topic of interest related to the branch-specific courses offered in previous semester of the programme. He / she shall select the topic based on the references: from reputed International Journals, preferably IEEE journals. They should get the paper approved by the Programme Co-ordinator / Faculty member in charge of the seminar and shall present it in the class. Proper presentation aid can be used. Every student shall participate in the seminar. The students should undertake a detailed study on the topic and submit a report prior to the presentation. Marks will be awarded based on the topic, presentation, participation in the seminar and the report submitted.

### **Social Service**

#### **Course Outline**

The Social Work programme aims to develop competency among students in critical thinking, knowledge building and a set of practice skills in the area of conceiving, designing and managing social enterprises with a view to create wealth for the poor. The objective of the course is to nurture entrepreneurial attributes of young professionals and equip them to build entrepreneurial ventures in emerging social sectors. The programme seeks to create a cadre of professionals equipped to visualize economic opportunities, conceive and design plans, raise resources, develop products and services, and evaluate and change existing systems of operation. In addition, the students will develop competency in designing and redesigning appropriate and efficient service delivery systems, and creating and strengthening an effective organizational mechanism in social enterprises.

## Semester 6

C. No	Course Code	Course Name	Credit	Marks			Hrs		
				Int	Ext	Tot	T	P	Tot
6.1	SDC6IT22 (Pr)	Internship & Project (900 hrs)	30	0	100	100		900	
<b>Semester VI Total</b>			<b>30</b>			<b>100</b>		<b>900</b>	

### SDCIT22 (Pr) - Industrial Training and Project

**Course No:** 6.1

**Course Code:** SDCIT22 (Pr)

**Course Name:** Industrial Training and Project

**Credits:** 30

**Hours:** 900 Hours

On completion of this course, the student should be able to:

Utilize the theoretical knowledge and practical experiences to solve a real life problem with high standard and accuracy.

Get a feel of organizational atmosphere and their practices.

Induce confidence to manage large engineering projects and make him work ready.

## **Prerequisites**

Software Engineering concepts

Programming skills

Knowledge of OS, Data structure and Database concepts.

## **Course Outline**

The student shall undergo Industrial training and a project of four month duration. Industrial training should be carried out in an industry / company approved by the institution and under the guidance of a staff member in the concerned field. At the end of the training he / she have to submit a report on the work being carried out.

The project is designed to develop practical ability and knowledge about practical tools/techniques in order to solve real life problems related to the industry, academic institutions and computer science research. The project should strictly stick to the software engineering principles. Students can take up any application level/system level project pertaining to a relevant domain. Projects can be chosen either from the list provided by the faculty or in the field of interest of the student. For external projects, students should obtain prior permission after submitting the details of the external guide, institution and synopsis of the work. The project guide should have a minimum qualification of ME/M.Tech/MCA/M.Sc in Computer Science or related fields.

At the end of each phase, presentation and demonstration of the project should be conducted, which will be evaluated by a panel of examiners. A detailed project report duly approved by the guide in the prescribed format should be submitted for end semester assessment. Marks will be awarded based on the report and their performance during presentations and demonstrations. Publishing the work in Conference Proceedings/ Journals with National/ International status with the consent of the guide will carry an additional weightage in the review process.

### **References:**

1. Software Engineering: A Practitioner's Approach, Roger S Pressman
2. Systems Analysis and Design, Elias M. Awad.