Annamalai University

REGULATIONS FOR THE TWO-YEAR POST GRADUATE PROGRAMMES UNDER
CHOICE BASED CREDIT SYSTEM (CBCS)

These Regulations are common to all the students admitted to the Two-Year Master’s Programmes in the Faculties of Arts, Science, Indian Languages, Education, Marine Sciences, and Fine Arts from the academic year 2019-2020 onwards.

1. **Definitions and Nomenclature**

1.1 **University** refers to Annamalai University.

1.2 **Department** means any of the academic departments and academic centres at the University.

1.3 **Discipline** refers to the specialization or branch of knowledge taught and researched in higher education. For example, Botany is a discipline in the Natural Sciences, while Economics is a discipline in Social Sciences.

1.4 **Programme** encompasses the combination of courses and/or requirements leading to a Degree. For example, M.A., M.Sc.

1.5 **Course** is an individual subject in a programme. Each course may consist of Lectures/Tutorials/Laboratory work/Seminar/Project work/Experiential learning/ Report writing/viva-voce etc. Each course has a course title and is identified by a course code.

1.6 **Curriculum** encompasses the totality of student experiences that occur during the educational process.

1.7 **Syllabus** is an academic document that contains the complete information about an academic programme and defines responsibilities and outcomes. This includes course information, course objectives, policies, evaluation, grading, learning resources and course calendar.

1.8 **Academic Year** refers to the annual period of sessions of the University that comprises two consecutive semesters.

1.9 **Semester** is a half-year term that lasts for a minimum duration of 90 days. Each academic year is divided into two semesters.

1.10 **Choice Based Credit System** A mode of learning in higher education that enables a student to have the freedom to select his/her own choice of elective courses across various disciplines for completing the Degree programme.

1.11 **Core Course** is mandatory and an essential requirement to qualify for the Degree.

1.12 **Elective Course** is a course that a student can choose from a range of alternatives.

1.13 **Value-added Courses** are optional courses that complement the students’ knowledge and skills and enhance their employability.

1.14 **Credit** refers to the quantum of course work in terms of number of class hours in a semester required for a programme. The credit value reflects the content and duration of a particular course in the curriculum.

1.15 **Credit Hour** refers to the number of class hours per week required for a course in a semester. It is used to calculate the credit value of a particular course.

1.16 **Programme Outcomes (POs)** are statements that describe crucial and essential knowledge, skills and attitudes that students are expected to achieve and can reliably manifest at the end of a programme.

1.17 **Programme Specific Outcomes (PSOs)** are statements that list what the graduate of a specific programme should be able to do at the end of the programme.

1.18 **Learning Objectives also known as Course Objectives** are statements that define the expected goal of a course in terms of demonstrable skills or knowledge that will be acquired by a student as a result of instruction.

1.19 **Course Outcomes (COs)** are statements that describe what students should be able to achieve/demonstrate at the end of a course. They allow follow-up and measurement of Learning Objectives.

1.20 **Grade Point Average (GPA)** is the average of the grades acquired in various courses that a student has taken in a semester. The formula for computing GPA is given in section 11.3
1.21 **Cumulative Grade Point Average (CGPA)** is a measure of overall cumulative performance of a student over all the semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters.

1.22 **Letter Grade** is an index of the performance of a student in a particular course. Grades are denoted by the letters S, A, B, C, D, E, RA, and W.

2. **Programmes Offered and Eligibility Criteria**

   The Department of Business administration offers SEVEN two Year MBA Programmes and the eligibility criteria for each of these programmes are detailed below.

<table>
<thead>
<tr>
<th>Faculty of Arts</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.No.</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>5.</td>
</tr>
<tr>
<td>7.</td>
</tr>
</tbody>
</table>

2.1 In the case of SC/ST and Differently-abled candidates, a pass is the minimum qualification for all the above Programmes.

3. **Reservation Policy**

   Admission to the various programmes will be strictly based on the reservation policy of the Government of Tamil Nadu.

4. **Programme Duration**

   4.1 The Two Year Master's Programmes consist of two academic years.

   4.2 Each academic year is divided into two semesters, the first being from July to November and the second from December to April.

   4.3 Each semester will have 90 working days (18 weeks).

5. **Programme Structure**

   5.1 The Two Year Master’s Programme consists of Core Courses, Elective Courses (Departmental & Interdepartmental), and Project.

   5.2 **Core courses**

   5.2.1 These are a set of compulsory courses essential for each programme.

   5.2.2 The core courses include both Theory (Core Theory) and Practical (Core Practical) courses.

   5.3 **Elective courses**

   5.3.1 **Departmental Electives (DEs)** are the Electives that students can choose from a range of Electives offered within the Department.

   5.3.2 **Interdepartmental Electives (IDEs)** are Electives that students can choose from amongst the courses offered by other departments of the same faculty as well as by the departments of other faculties.

   5.3.3 **Students shall take a combination of both DEs and IDEs.**

   5.4 **Experiential Learning**

   5.4.1 Experiential learning provides opportunities to students to connect principles of the discipline with real-life situations.

   5.4.2 In-plant training/field trips/internships/industrial visits (as applicable) fall under this category.

   5.4.3 Experiential learning is categorised as Core.
5.5 **Project**

5.5.1 Each student shall undertake a Project in the final semester.

5.5.2 The Head of the Department shall assign a Research Supervisor to the student.

5.5.3 The Research Supervisor shall assign a topic for research and monitor the progress of the student periodically.

5.5.4 Students who wish to undertake project work in recognised institutions/industry shall obtain prior permission from the University. The Research Supervisor will be from the host institute, while the Co-Supervisor shall be a faculty in the parent department.

5.6 **Value added Courses (VACs)**

5.6.1 Students may also opt to take Value added Courses beyond the minimum credits required for award of the Degree. VACs are outside the normal credit paradigm.

5.6.2 These courses impart employable and life skills. VACs are listed in the University website and in the Handbook on Interdepartmental Electives and VACs.

5.6.3 Each VAC carries 2 credits with 30 hours of instruction, of which 60% (18 hours) shall be Theory and 40% (12 hours) Practical.

5.6.4 Classes for a VAC are conducted beyond the regular class hours and preferably in the II and III Semesters.

5.7 **Online Courses**

5.7.1 The Heads of Departments shall facilitate enrolment of students in Massive Open Online Courses (MOOCs) platform such as SWAYAM to provide academic flexibility and enhance the academic career of students.

5.7.2 Students who successfully complete a course in the MOOCs platform shall be exempted from one elective course of the programme.

5.8 **Credit Distribution**

The credit distribution is organised as follows:

<table>
<thead>
<tr>
<th></th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Courses</td>
<td>65-75</td>
</tr>
<tr>
<td>Elective Courses</td>
<td>15</td>
</tr>
<tr>
<td>Project</td>
<td>6-8</td>
</tr>
<tr>
<td>Total (Minimum requirement for award of Degree)</td>
<td><strong>90-95</strong></td>
</tr>
</tbody>
</table>

*Each Department shall fix the minimum required credits for award of the Degree within the prescribed range of 90-95 credits.

5.9 **Credit Assignment**

Each course is assigned credits and credit hours on the following basis:

- 1 Credit is defined as
- 1 Lecture period of one hour per week over a semester
- 1 Tutorial period of one hour per week over a semester
- 1 Practical/Project period of two or three hours (depending on the discipline) per week over a semester.

6 **Attendance**

6.1 Each faculty handling a course shall be responsible for the maintenance of Attendance and Assessment Record for candidates who have registered for the course.

6.2 The Record shall contain details of the students’ attendance, marks obtained in the Continuous Internal Assessment (CIA) Tests, Assignments and Seminars. In addition the Record shall also contain the organisation of lesson plan of the Course Instructor.
6.3 The record shall be submitted to the Head of the Department once a month for monitoring the attendance and syllabus coverage.

6.4 At the end of the semester, the record shall be duly signed by the Course Instructor and the Head of the Department and placed in safe custody for any future verification.

6.5 The Course Instructor shall intimate to the Head of the Department at least seven calendar days before the last instruction day in the semester about the attendance particulars of all students.

6.6 Each student shall have a minimum of 75% attendance in all the courses of the particular semester failing which he or she will not be permitted to write the End-Semester Examination. The student has to redo the semester in the next year.

6.7 Relaxation of attendance requirement up to 10% may be granted for valid reasons such as illness, representing the University in extracurricular activities and participation in NCC/NSS/YRC/RRC.

7 Mentor-Mentee System

7.1 To help the students in planning their course of study and for general advice on the academic programme, the Head of the Department will attach certain number of students to a member of the faculty who shall function as a Mentor throughout their period of study.

7.2 The Mentors will guide their mentees with the curriculum, monitor their progress, and provide intellectual and emotional support.

7.3 The Mentors shall also help their mentees to choose appropriate electives and value-added courses, apply for scholarships, undertake projects, prepare for competitive examinations such as NET/SET, GATE etc., attend campus interviews and participate in extracurricular activities.

8 Examinations

8.1 The examination system of the University is designed to systematically test the student's progress in class, laboratory and field work through Continuous Internal Assessment (CIA) Tests and End-Semester Examination (ESE).

8.2 There will be two CIA Tests and one ESE in each semester.

8.3 The Question Papers will be framed to test different levels of learning based on Bloom’s taxonomy viz. Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation/Creativity.

8.4 Continuous Internal Assessment Tests

8.4.1 The CIA Tests shall be a combination of a variety of tools such as class tests, assignments, seminars, and viva-voce that would be suitable to the course. This requires an element of openness.

8.4.2 The students are to be informed in advance about the assessment procedures.

8.4.3 The pattern of question paper will be decided by the respective faculty.

8.4.4 CIA Test-I will cover the syllabus of the first two Units while CIA Test-II will cover the last three Units.

8.4.5 CIA Tests will be for two to three hours duration depending on the quantum of syllabus.

8.4.6 A student cannot repeat the CIA Test-I and CIA Test-II. However, if for any valid reason, the student is unable to attend the test, the prerogative of arranging a special test lies with the teacher in consultation with the Head of the Department.

8.5 End Semester Examinations (ESE)

8.5.1 The ESE for the first/third semester will be conducted in November and for the second/fourth semester in May.
8.5.2 A candidate who does not pass the examination in any course(s) of the first, second and third semesters will be permitted to reappear in such course(s) that will be held in April and November in the subsequent semester/year.

8.5.3 The ESE will be of three hours duration and will cover the entire syllabus of the course.

9 Evaluation

9.1 Marks Distribution

9.1.1 Each course, both Theory and Practical as well as Project/Internship/Field work/In-plant training shall be evaluated for a maximum of 100 marks. For the theory courses, CIA Tests will carry 25% and the ESE 75% of the marks.

9.1.2 For the Practical courses, the CIA Tests will constitute 40% and the ESE 60% of the marks.

9.2 Assessment of CIA Tests

9.2.1 For the CIA Tests, the assessment will be done by the Course Instructor

9.2.2 For the Theory Courses, the break-up of marks shall be as follows:

<table>
<thead>
<tr>
<th></th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test-I &amp; Test-II</td>
<td>15</td>
</tr>
<tr>
<td>Seminar</td>
<td>05</td>
</tr>
<tr>
<td>Assignment</td>
<td>05</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
</tr>
</tbody>
</table>

9.2.3 For the Practical Courses (wherever applicable), the break-up of marks shall be as follows:

<table>
<thead>
<tr>
<th></th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test-I</td>
<td>15</td>
</tr>
<tr>
<td>Test-II</td>
<td>15</td>
</tr>
<tr>
<td>Viva-voce and Record</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
</tr>
</tbody>
</table>

9.3 Assessment of End-Semester Examinations

9.3.1 Evaluation for the ESE is done by both External and Internal examiners (Double Evaluation).

9.3.2 In case of a discrepancy of more than 10% between the two examiners in awarding marks, third evaluation will be resorted to.

9.4 Assessment of Project/Dissertation

9.4.1 The Project Report/Dissertation shall be submitted as per the guidelines laid down by the University.

9.4.2 The Project Work/Dissertation shall carry a maximum of 100 marks.

9.4.3 CIA for Project will consist of a Review of literature survey, experimentation/field work, attendance etc.

9.4.4 The Project Report evaluation and viva-voce will be conducted by a committee constituted by the Head of the Department.

9.4.5 The Project Evaluation Committee will comprise the Head of the Department, Project Supervisor, and a senior faculty.

9.4.6 The marks shall be distributed as follows:

<table>
<thead>
<tr>
<th>Continuous Internal Assessment (25 Marks)</th>
<th>End Semester Examination (75 Marks)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Project / Dissertation Evaluation</td>
</tr>
<tr>
<td></td>
<td>Viva-voce</td>
</tr>
</tbody>
</table>
9.5 **Assessment of Value-added Courses**

9.5.1 Assessment of VACs shall be internal.

9.5.2 Two CIA Tests shall be conducted during the semester by the Department(s) offering VAC.

9.5.3 A committee consisting of the Head of the Department, faculty handling the course and a senior faculty member shall monitor the evaluation process.

9.5.4 The grades obtained in VACs will not be included for calculating the GPA.

9.6 **Passing Minimum**

9.6.1 A student is declared to have passed in each course if he/she secures not less than 40% marks in the ESE and not less than 50% marks in aggregate taking CIA and ESE marks together.

9.6.4 A candidate who has not secured a minimum of 50% of marks in a course (CIA + ESE) shall reappear for the course in the next semester/year.

10. **Conferment of the Master’s Degree**

A candidate who has secured a minimum of 50% marks in all courses prescribed in the programme and earned the minimum required credits shall be considered to have passed the Master’s Programme.

11. **Marks and Grading**

11.1 The performance of students in each course is evaluated in terms Grade Point (GP).

11.2 The sum total performance in each semester is rated by Grade Point Average (GPA) while Cumulative Grade Point Average (CGPA) indicates the Average Grade Point obtained for all the courses completed from the first semester to the current semester.

11.3 The GPA is calculated by the formula

\[
GPA = \frac{\sum_{i=1}^{n} C_i G_i}{\sum_{i=1}^{n} C_i}
\]

where, \(C_i\) is the Credit earned for the Course \(i\) in any semester; \(G_i\) is the Grade Point obtained by the student for the Course \(i\) and \(n\) is the number of Courses passed in that semester.

11.4 CGPA is the Weighted Average Grade Point of all the Courses passed starting from the first semester to the current semester.

\[
CGPA = \frac{\sum_{i=1}^{m} \sum_{j=1}^{n} C_i G_j}{\sum_{i=1}^{m} \sum_{j=1}^{n} C_i}
\]

where, \(C_i\) is the Credit earned for the Course \(i\) in any semester; \(G_j\) is the Grade Point obtained by the student for the Course \(j\) and \(n\) is the number of Courses passed in that semester. \(m\) is the number of semesters.

11.5 Evaluation of the performance of the student will be rated as shown in the Table.

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Grade Points</th>
<th>Marks %</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>10</td>
<td>90 and above</td>
</tr>
<tr>
<td>A</td>
<td>9</td>
<td>80-89</td>
</tr>
<tr>
<td>B</td>
<td>8</td>
<td>70-79</td>
</tr>
</tbody>
</table>
11.6 Classification of Results. The successful candidates are classified as follows:

11.6.1 For **First Class with Distinction**: Candidates who have passed all the courses prescribed in the Programme *in the first attempt* with a CGPA of 8.25 or above within the programme duration. Candidates who have withdrawn from the End Semester Examinations are still eligible for First Class with Distinction (See Section 12 for details).

11.6.2 For **First Class**: Candidates who have passed all the courses with a CGPA of 6.5 or above.

11.6.3 For **Second Class**: Candidates who have passed all the courses with a CGPA between 5.0 and less than 6.5.

11.6.4 Candidates who obtain highest marks in all examinations at the first appearance alone will be considered for University Rank.

11.7 Course-Wise Letter Grades

11.7.1 The percentage of marks obtained by a candidate in a course will be indicated in a letter grade.

11.7.2 A student is considered to have completed a course successfully and earned the credits if he/she secures an overall letter grade other than RA.

11.7.3 A course successfully completed cannot be repeated for the purpose of improving the Grade Point.

11.7.4 A letter grade RA indicates that the candidate shall reappear for that course. The RA Grade once awarded stays in the grade card of the student and is not deleted even when he/she completes the course successfully later. The grade acquired later by the student will be indicated in the grade sheet of the Odd/Even semester in which the candidate has appeared for clearance of the arrears.

11.7.5 If a student secures RA grade in the Project Work/Field Work/Practical Work/Dissertation, he/she shall improve it and resubmit if it involves only rewriting/incorporating the clarifications suggested by the evaluators or he/she can re-register and carry out the same in the subsequent semesters for evaluation.

12. Provision for Withdrawal from the End Semester Examination

12.1 The letter grade W indicates that a candidate has withdrawn from the examination.

12.2 A candidate is permitted to withdraw from appearing in the ESE for one course or courses in ANY ONE of the semesters ONLY for exigencies deemed valid by the University authorities.

12.3 Permission for withdrawal from the examination shall be granted only once during the entire duration of the programme.

12.4 Application for withdrawal shall be considered only if the student has registered for the course(s), and fulfilled the requirements for attendance and CIA tests.

12.4 The application for withdrawal shall be made ten days prior to the commencement of the examination and duly approved by the Controller of Examinations. Notwithstanding the mandatory prerequisite of ten days notice, due consideration will be given under extraordinary circumstances.
12.5 Withdrawal is not granted for arrear examinations of courses in previous semesters and for the final semester examinations.

12.6 Candidates who have been granted permission to withdraw from the examination shall reappear for the course(s) when the course(s) are offered next.

12.7 Withdrawal shall not be taken into account as an appearance for the examination when considering the eligibility of the candidate to qualify for First Class with Distinction.

13. Academic misconduct

Any action that results in an unfair academic advantage/interference with the functioning of the academic community constitutes academic misconduct. This includes but is not limited to cheating, plagiarism, altering academic documents, fabrication/falsification of data, submitting the work of another student, interfering with other students' work, removing/defacing library or computer resources, stealing other students' notes/assignments, and electronically interfering with other students'/University's intellectual property. Since many of these acts may be committed unintentionally due to lack of awareness, students shall be sensitised on issues of academic integrity and ethics.

14. Transitory Regulations

Wherever there has been a change of syllabi, examinations based on the existing syllabus will be conducted for two consecutive years after implementation of the new syllabus in order to enable the students to clear the arrears. Beyond that, the students will have to take up their examinations in equivalent subjects, as per the new syllabus, on the recommendation of the Head of the Department concerned.

15. Notwithstanding anything contained in the above pages as Rules and Regulations governing the Two Year Master’s Programmes at Annamalai University, the Syndicate is vested with the powers to revise them from time to time on the recommendations of the Academic Council.
### Programme Structure
(For students admitted from the academic year 2019-2020)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours per week</th>
<th>C</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>L  P</td>
<td>CIA</td>
<td>ESE</td>
</tr>
<tr>
<td>19BBAC101</td>
<td>Core 1: Management Concepts and Organizational Behavior</td>
<td>4 - 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAC102</td>
<td>Core 2: Introduction to Analytics</td>
<td>4 - 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAC103</td>
<td>Core 3: Accounting for Managers</td>
<td>4 - 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAC104</td>
<td>Core 4: Statistical Decision Making</td>
<td>4 - 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAC106</td>
<td>Core 5: E-Business Management</td>
<td>4 - 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAC107</td>
<td>Core 6: Introduction to R (Practical)</td>
<td>- 4 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAC108</td>
<td>Core 7: Spreadsheet Modelling</td>
<td>4 - 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4 1</td>
<td>CIA</td>
<td>ESE</td>
</tr>
<tr>
<td>19BBAC201</td>
<td>Core 8: Marketing &amp; CRM</td>
<td>4 - 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAC202</td>
<td>Core 9: Business Strategy</td>
<td>4 - 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAC203</td>
<td>Core 10: PYTHON (Practical)</td>
<td>- 4 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAC204</td>
<td>Core 11: Time Series Forecasting</td>
<td>4 - 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19XXXX205</td>
<td>Elective 1: Interdepartmental Elective</td>
<td>3 - 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAE206</td>
<td>Elective 2: Department Elective</td>
<td>4 - 4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAE207</td>
<td>Elective 3: Department Elective</td>
<td>4 - 4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAC208</td>
<td>Applied Project in Big Data Analysis</td>
<td>- - 2</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4 5</td>
<td>CIA</td>
<td>ESE</td>
</tr>
</tbody>
</table>

**Value Added Course (VAC)**
Covers Additional Credits

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours per week</th>
<th>C</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>L  P</td>
<td>CIA</td>
<td>ESE</td>
</tr>
<tr>
<td>19BBAC301</td>
<td>Core 12: Data Visualization (HADOOP/TABLEAU)</td>
<td>4 - 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAC302</td>
<td>Core 13: e-Governance and Cyber Law</td>
<td>4 - 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAC303</td>
<td>Core 14: Soft Skills</td>
<td>4 - 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAC304</td>
<td>Core 15: SQL (Practical)</td>
<td>- 4 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAE306</td>
<td>Elective 4: Department Elective</td>
<td>4 - 4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAE307</td>
<td>Elective 5: Department Elective</td>
<td>- - 4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAC308</td>
<td>Project Work (Intern with Analytics Firm)</td>
<td>- - 4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4 4</td>
<td>CIA</td>
<td>ESE</td>
</tr>
</tbody>
</table>

**Value Added Course (VAC)**
Covers Additional Credits

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours per week</th>
<th>C</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>L  P</td>
<td>CIA</td>
<td>ESE</td>
</tr>
<tr>
<td>19BBAC401</td>
<td>Core 16: Operations &amp; Supply Chain Analytics</td>
<td>4 - 3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>19BBAC402</td>
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### Programme Outcomes

**PO1:** Critical thinking  
**PO2:** Cultivating Cognitive skills required in the job market  
**PO3:** Effective Communication  
**PO4:** Familiarity with ICT to thrive in the information age  
**PO5:** Cultivating aptitude for research  
**PO6:** Respect for alternate view-points including those conflicting with one’s own perspectives  
**PO7:** Ability to work individually and as members in a team  
**PO8:** Upholding ethical standards  
**PO9:** Acting local while thinking global  
**PO10:** Commitment to gender equality  
**PO11:** Commitment to Sustainable development  
**PO12:** Lifelong learning

### Programme Specific Outcomes

Annamalai University is a pioneering institution among all state universities in providing Business Administration programme in Business Analytics with the following objectives:

**PSO1:** To facilitate you develop proficiency in the key knowledge areas of business analytics  
**PSO2:** To deepen analytical skills and investigate data to establish new relationships and patterns  
**PSO3:** To provide practical hands-on experience with statistics programming languages and big data tools  
**PSO4:** To develop understanding in data science and master technology trends of Data Analytics, Big Data, Cloud computing and Machine Learning  
**PSO5:** To have proficiency in using tools and open source software to interpret data  
**PSO6:** To understand and explore problems in business and provide viable solutions using analytics  
**PSO7:** To interpret data as well as projects and tasks that are based on real-life case studies  
**PSO8:** To demonstrate use of teamwork, leadership skills, decision making in their future career
Learning Objective

The objective of this course is

LO1: To provide foundational knowledge associated with managerial functions

LO2: To enable students to effectively identify the recent management thoughts

LO3: To help students understand the conceptual framework of management and organizational behavior.

LO4: To explain how organizational change and culture affect working relationships within organizations.

LO5: To provide foundational knowledge on leadership theory and styles.

Unit-1 Management Thought (12 h)

Unit-2 Managerial Functions (12 h)
Planning - concept, significance, types; Organizing - concept, principles, theories, types of organizations, authority, responsibility, power, delegation. Decentralization; Staffing; Directing; Coordinating; Control - nature, process, and techniques.

Unit-3 Organizational Behaviour (12 h)
Organisational behaviour - concept and significance; Relationship between management and organisational behaviour; organizational culture, Attitudes; Perception; Learning; Personality and values; emotions and moods. Motivation: Process of motivation; Theories of motivation - need hierarchy theory, theory X and theory Y, two factor theory, Alderfer's ERG theory, Victor Vroom's expectancy theory.

Unit-4 Leadership Concept (12 h)
Leadership styles; Theories -trait theory, behavioral theory, Group dynamics -definition and importance, types of groups, group formation, group development, group composition, group performance factors; Approach to team development.

Unit-5 Organizational Conflict and Negotiations (12 h)
Dynamics and management; Sources, patterns, levels, and types of conflict; Traditional and modern approaches to conflict; Functional and dysfunctional organizational conflicts; Resolution of conflict. Organizational Development: Concept; Need for change, resistance to change; Theories of planned change; organization change and stress management, Organizational diagnosis.

Text Books


Supplementary Readings


Course Outcome

Upon completion of this course, the student will have the ability to

CO1: Describe and assess the basic managerial functions and evaluate its impact on organizational development.
CO2: Evaluate the appropriateness of various leadership styles and conflict management strategies used in organizations.
CO3: Analyze individual and group behaviour, and understand the implications of organizational behaviour on the process of management.
CO4: Demonstrate critical thinking skills on application of motivational theories
CO5: Knowledge on organizational conflict and negotiations techniques in an organization and real life problems,
CO6: Ability to work as member in a team and to develop competitive edge to work with large corporate

Outcome Mapping

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Semester – I

19BBAC102: Introduction to Business Analytics

Credits: 3
Hours: 60

Learning Objective
The objective of this course is
LO1: To Study core statistical techniques; data retrieval, analysis and mining
LO2: To effectively persuade in the project-oriented world of data-driven decisions.
LO3: To understand the purpose of using business analysis tools within an organization
LO4: To analyse a dataset for making a business decisions.
LO5: To use R studio for data analysis.

Unit-1 Introduction to Business Analytics and Big Data (12 h)

Unit-2 Application of Business Analytics (10 h)

Unit-3 Decision support and Data Visualisation (12 h)
DSS- Executive and enterprise support- Automated decision support - Web analytics- Data mining -Applied artificial intelligence - Visual analysis: Data concepts – Data Dashboards - Data exploration & visualization - Scorecards

Unit-4 Time Series and Forecasting (14 h)

Unit-5 Data Analysis using R (12 h)
R Studio: Introduction – R data types and objects, reading and writing data - Data structures in R - R programming fundamentals - Advantages and disadvantages of using R.

Text Books
1) Majid Nabavi, David L.Olson, Introduction to Business Analytics, Business Expert Press, 2018

**Supplementary Readings**

**Course Outcome**
Upon completion of this course, the student will have the ability to
CO1: Critically analyze the business problems and apply analytical knowledge in big data
CO2: Recognize, understand and apply the language, theory and models of the field of business analytics
CO3: Able to cultivating cognitive skills on the applications of business analytics.
CO4: Commitment to sustainable development of data visualization and time series analysis related to various sectors.
CO5: Provide leadership in application of using R statistics
CO6: Cultivating cognitive skills acquired on forecasting methods

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**Semester – I**

19BBAC103: *Accounting For Managers*  
*Credits: 3  *  
*Hours: 60*

**Learning Objective**
The objective of the course is
LO1: To acquaint the students with the various concepts, techniques, methods, process of accounting data analysis and interpretation,
LO2: To understand the concepts of decision making in the areas of Financial and Management Accounting.
LO3: To provide fundational knowledge on fund flow analysis and ration analysis
LO4: To enable students to effectively identify the techniques of Cost Accounting
LO5: To provide the practice exposure on cost analysis

**Unit-1**  *Introduction to Management Accounting and Financial Accounting (12 h)*

**Unit-2**  *Financial Statement Analysis, Ratio Analysis, Fund and Cash Flow Analysis (12 h)*
Unit-3 Methods and Techniques of Cost Accounting (10 h)
Concept of cost – Elements of cost – Cost Accounting – Objectives – Cost Sheet (Problems) – Classification of cost – Cost Unit and Cost Centre – Methods of Costing _ Techniques of Costing.

Unit-4 Marginal Costing, Budget and Budgetary Control (12 h)
Marginal Costing – Concept – Advantages and Disadvantages – Break even analysis – Cost volume profit analysis – Budget and Budgetary control – Objectives – Type of budgets – Preparation of Sales, Cash, flexible and master budgets (simple problems).

Unit-5 Standard Costing and Variance Analysis (12 h)

Text Books

Supplementary Readings
3. Maheswari, S.N., Cost and Management Accounting, Sultan Chand & Sons.,Publisher New Delhi, 2013.

Course Outcome
After completion of this course, the student will have the ability to
CO1: Have stronger understanding of the basic accounting and regulations of accounting format
CO2: Analysis the financial statement with ethical standards.
CO3: Understanding different financial items like ratio, capital budgeting, marginal costing etc.
CO4: Evaluate and solve the accounting problems and it helps for financial decision making.
CO5: Cultivating cognitive skills acquired on standard costing and variance analysis
CO6: Commitment to sustainable development of budget and budgetary control system

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Semester – I 19BBAC104: Statistics for Business Decision Making Credits: 3 Hours: 60

Learning Objective
The objective of the course is
LO1: To equip the students with the basic understanding of the research methodology
LO2: To provide an insight into the application of modern analytical tools and techniques for the
purpose of management decision making

LO3: To provide hands on experience in SPSS software
LO4: To understand and analyze the factor and cluster analysis
LO5: To get idea on application of non-parametric tools.

Unit-1 Introduction to Research (10 h)
Research – Meaning – Types – Nature and scope of research – Problem formulation – Statement of research Objective – Importance of research in Management – Research process – Research designs

Unit-2 Data Collection Methods (10 h)
Data Collection Methods of data collection – Observational and Survey methods – Field surveys – Sampling methods & techniques – Sample size

Unit-3 Research Tools (12 h)
Sources of Data – Primary – Secondary data – Questionnaire Design; Attitude measurement techniques – Scaling Techniques - Simple Tabulation and Cross Tabulation– Frequencies – Percentage – Charts

Unit-4 Parametric Tools (14 h)

Unit-5 Non-Parametric Tools (14 h)
Scale Validation - Normality Test - Chi–square test – 1-sample Wilcoxon signed rank test. - Friedman test - Kruskal-Wallis test - Mann-Whitney test - Spearman Rank Correlation

Text Books

Supplementary Readings

Course Outcome
Upon completion of this course, the student will have the ability to

CO1: Develop expertise in describing data, cultivating aptitude for research design, hypothesis testing and model building
CO2: Increase their capability as a manager to think statistically using data
CO3: Apply cognitive skills to support the data collection methods to solve the problems
CO4: Provide experience in statistical methods in decision making process
CO5: Cultivating cognitive skills acquired on using the parametric and non-parametric tools for various service sectors.
CO6: Apply analytical knowledge in business statistics for sustainable development of an organisation

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Learning Objective
The objective of the course is
LO1: To understand the practices and technology to start an online business.
LO2: To know how to build and manage an e-business.
LO3: To recognize the fundamental principles of e-Business and e-Commerce.
LO4: To distinguish the role of management in the context of e-Business and e-Commerce
LO5: To explain the added value, risks and barriers in the adoption of e-Business and e-commerce

Unit-1 Introduction to e-Business (12 h)
Overview of E-Business; Fundamentals, E-Business framework; E-Business application; Major requirements in E-Business; Emerging trends and technologies in E-Business; From ECommerce to E-Business.

Unit-2 Technology Infrastructure (10 h)
Internet and World Wide Web, internet protocols - FTP, intranet and extranet, information publishing technology- basics of web server hardware and software.

Unit-3 Business Applications (14 h)
Consumer oriented e-business – e-tailing and models - Marketing on web – advertising, e-mail marketing, affiliated programs - e-CRM; online services, Business oriented e-business, e-governance, EDI on the internet.

Unit-4 E-Business Payments and Security (12 h)

Unit-5 Legal and Privacy Issues (12 h)
Legal, Ethics and privacy issues – Protection needs and methodology – consumer protection, cyber laws, contracts and warranties, Taxation and encryption policies.

Text Books
1. ParagKulkarni, SunitaJahirabadkao, PradeepChande, e business, Oxford University Supplementary Readings

Supplementary Readings

Course Outcome
Upon completion of this course, the student will have the ability to

CO1: Cultivating cognitive skills acquired on the internet in the development of a virtual e-commerce site.
CO2: Critically thinking a various issue in electronic payment systems which held in various fields.
CO3: Apply analytical knowledge in the security protocols and the issues in internet security
CO4: Examine the various legal and ethical issues specific to E-Business for effective decisions
CO5: Capable to analyze problem using the applications of e-Commerce in global level.
CO6: Commitment to sustainable development of e-business activities with unparalleled ideas.
Learning Objective
The objective of the course is
LO1: To give an introduction to the software R and how to write elementary programs
LO2: To demonstrate how statistical models are implemented and applied
LO3: To write simple program scripts for data analysis
LO4: To produce illustrative data plots and carry out statistical tests
LO5: To get hands-on experience to work with Statistical graphs.

Unit-1 Introduction to the R language (12 h)
Introduction to the R language - SAS versus R - R, S, and S-plus - Obtaining and managing R - Objects - types of objects, classes, creating and accessing objects - Arithmetic and matrix operations - Introduction to functions.

Unit-2 Working with R (12 h)
Working with R - Reading and writing data - R libraries - Functions and R programming – the If statement - looping: for, repeat, while - writing functions - function arguments and options – Basic R commands

Unit-3 Graphics (10 h)
Graphics - Basic plotting - Manipulating the plotting window - Advanced plotting using lattice library - Saving plots.

Unit-4 Standard statistical models in R (12 h)
Standard statistical models in R - Model formulae and model options - Output and extraction from fitted models - Models considered: Linear regression: lm() , Logistic regression: glm() , Linear mixed models: lme()

Unit-5 Advanced R (14 h)

Text Books

Supplementary Readings

**Course Outcome**
By the end of this course students should be able to
CO1: CO1: Critically thinking on import, manage and structure data files for using business analytics.
CO2: CO2: Apply analytical knowledge with the R interface and language for different fields.
CO3: CO3: Provide leadership in analytics in existing datasets into R or create new ones
CO4: CO4: Cultivating cognitive skills acquired on existing data and performs all conventional statistical analysis tests
CO5: CO5: Capable to analyze problems using R knowledge on data management for sustainable development of the organisation.
CO6: CO6: Effectively solve business problems and make effective decision making using R Statistics.

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**Semester – I**

**19BBAC107: Spreadsheet Modeling**

**Credits:** 4  
**Hours:** 60

**Learning Objective**
The objective of the course is
LO1: To cover all aspects of creating spreadsheet, performing calculations, formatting, some very widely used formulas
LO2: To enable the students to create, build models and customize graphs,
LO3: To develop advanced solutions on the worksheet in the areas of marketing, finance, statistics, production and human resource and to assemble the proper Excel tools.
LO4: To become expertise on Spreadsheet Modeling in Statistics
LO5: To understand the concepts of Spread Sheet Modeling In Production and Human Resource

**Unit-1 Introduction to Spreadsheet Modeling (12 h)**
Formulas/Formatting/Printing/Functions Cell references, Lookup tables, Linking disparate work books, Dynamic, linking, updating links, data validation, Goal seek, Pivot table, Sorting Charting and filtering and protecting spread sheets

**Unit-2 Spread Sheet Modeling in Sales and Marketing: (12 h)**
New product decision making–Sales and marketing data analysis

**Unit-3 Spreadsheet Modeling in Finance (12 h)**
Forecasting financial statements – NPV & IRR, Bond valuation, Stock valuation - Fundamentals, Budgeting, Ratio analysis

**Unit-4 Spreadsheet Modeling in Statistics (12 h)**
Measures of central tendency, t test, ANOVA, Correlation, Regression and Time series

**Unit-5 Spread Sheet Modeling In Production and Human Resource (12 h)**
ABC analysis, Economic Order Quantity, Production budget – Employee payroll decision making
Text Books

Supplementary Readings

Course Outcome
Upon completion of this course, the student will have the ability to
CO1: Perform, recognize and formulate business problems in using Excel spreadsheets
CO2: Evaluate or solve Excel spreadsheet models using professional software
CO3: Apply analytical knowledge in the concepts and techniques of spread sheets to solve the real-world business situations and take effective decisions
CO4: Critically thinking and compare the applications of Spread sheet modeling in real life situation
CO5: Use cognitive skills to the application of t-test and ANOVA through spread sheet and develop competitive edge for a large corporate.
CO6: Capable to analyze problems using spread sheet modeling in Finance, HR and Marketing fields.

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Learning Objective
The objective of the course is
LO1: acclimatize the participants about the environment of market, consumer behaviour
LO2: To identify, understand, and apply basic marketing concepts to solving marketing challenges
LO3: To train the students to develop a sound Integrated Marketing Communications plan
LO4: To develop the ability to design the best marketing strategy by analyzing the factors influencing the consumer decision
LO5: To understand the importance of CRM, its practices, techniques and application

Unit-1 Introduction of Marketing (12 h)

Unit-2 Marketing Mix – Product & Price (12 h)

Unit-3 Marketing Mix - Physical Distribution and Promotion (12 h)

Unit-4 CRM in Marketing (12 h)

Unit-5 Analytical CRM (12 h)
Managing and sharing customer data - Customer information 2 databases - Ethics and legalities of data use - Data Warehousing and Data Mining concepts - Data analysis - Market Basket Analysis (MBA), Click stream Analysis, Personalization and Collaborative Filtering.

Text Books

Supplementary Readings
**Course Outcomes**
Upon completing this course, the student will be able to
CO1: Acquire required skills in solving marketing related problems and challenges
CO2: Analyse the relevance of Marketing concepts and theories in evaluating environmental changes on marketing planning, strategies and practices
CO3: Determine strategies for developing new products and services that are consistent with evolving market needs
CO4: Formulate marketing plan and employ digital tools to analyze the effectiveness of a marketing campaign
CO5: Understand the implementation of CRM best practices and customer relationships
CO6: Work professionally in CRM team and exhibit leadership skills

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**Semester – II**

**19BBAC202: Business Strategy**

**Credits:** 3  
**Hours:** 60

**Learning Objective**
The objective of the course is
LO1: To describe the practical and integrative model of strategic management process that defines basic activities in strategic management
LO2: To develop the ability in understanding business environment and formulation of strategies in the real business situation.
LO3: To gain the knowledge and abilities in formulating strategies and strategic plans
LO4: To demonstrate understanding of the concept of competitive advantage and its sources and the ability to recognize it in real-world scenarios
LO5: To understand and think critically in relation to a particular problem, situation or strategic decision through real-world scenarios

**Unit-1 Basic concepts of strategy (12 h)**

**Unit-2 Strategy Formulation – Competitive Strategy (12 h)**

**Unit-3 Strategy Formulation - Corporate Strategy (12 h)**

**Unit-4 Strategy Implementation (12 h)**
Unit-5  Strategy Evaluation and control (12 h)
Strategy Review – Strategy Evaluation and Control – Strategic Audit – Michael Porter’s
Competitive Advantage - Strategy for Entrepreneurial Ventures and Small business - Strategy for
non-profit organizations.

Text Books
1. Thompson A., Margaret A Peteraf, John E Gamble, A J Strickland and
2. Ghosh, P.K., Strategic Management Text & Cases, Sultan Chand & Sons,
New Delhi, 2012.

Supplementary Readings
Hill, New Delhi, 2012.
2. Hill, Charles W.L., Gareth R. Jones, Strategic Management Theory: An Integrated
Approach, Cengage Learning, New Delhi, 10th edition 2012
3. Francis Cherunilam, Strategic Management, Himalaya Publishing House, Mumbai,

Course Outcome
Upon completing this course, the student will be able to
CO1: Recognize the different stages of industry evolution and recommend strategies appropriate
to each stage
CO2: Gain competence in crafting business strategies, evaluate action alternatives and make
sound strategic decisions
CO3: Asses and analyse business risks and improve ability to achieve effective outcomes
CO4: Appraise the resources and capabilities of the firm in terms of their ability to confer
sustainable competitive advantage
CO5: Demonstrate the ability to think critically in relation to a particular problem and formulate
strategies that leverage a firm's core competencies
CO6: Recognize strategic decisions and make appropriate recommendations for ethical decision-
making.

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Learning Objective

The objective of the course is

LO1: To learn to use Python for data analysis
LO2: To understand how to use lists, tuples, and dictionaries in Python programs
LO3: To define the structure and components of a Python program
LO4: To learn how to design and program Python applications
LO5: To provide students with an understanding of the role computation can play in solving problems

Unit-1 Introduction to Python (12 h)
Knowledge, Machines, Languages, Types, Variables Operators and Branching — Core elements of programs: Bindings, Strings, Input/Output, IDEs, Control Flow, Iteration, Guess and Check — Simple Programs: Approximate Solutions, Bisection Search, Floats and Fractions Newton - Raphson – Functions: Decomposition and Abstraction, Functions and Scope, Keyword Arguments, Specifications, Iteration vs Recursion, Inductive Reasoning, Towers of Hanoi, Fibonacci, Recursion on non-numerics, Files

Unit-2 Tuples and Lists (12 h)

Unit-3 Classes and Inheritance (12 h)
Object Oriented Programming, Class Instances, Methods Classes Examples , Why OOP, Hierarchies, Your Own Types – An Extended Example: Building a Class, Visualizing the Hierarchy, Adding another Class, Using Inherited Methods, Grade book Example, Generators

Unit-4 Computational Complexity (12 h)
Program Efficiency, Big Oh Notation, Complexity Classes Analyzing Complexity – Searching and Sorting Algorithms: Indirection, Linear Search, Bisection Search, Bogo and Bubble Sort, Selection Sort, Merge Sort

Unit-5 Optimization and Knapsack Problem (12 h)
Computational models, Intro to optimization - Knapsack Problem, Greedy solutions – Decision Trees and Dynamic Programming: Decision tree solution to knapsack Dynamic programming and knapsack, Divide and conquer – Graphs: Graph problems, Shortest path, Depth first search, Breadth first search

Text Books

2. Siddhartha Chatterjee and Michal Krystyanczuk, Python Social Media Analytics, Packt Publishing Ltd, 2017

Supplementary Readings

1. Thamassia and Micheal S Goldwasser, Data Structures and Algorithms in Python by Michael T Goodrich and Roberto, Wiley Publisher (2016)
2. Introduction to Computation and Programming using Python, by John Guttag, PHI Publisher, Revised and Expanded version (Referred by MIT)2010

Course Outcome

Upon completing this course, the student will be able to
CO1: Capture data from internet and other sources
CO2: Plot data using appropriate Python visualization libraries
CO3: Create and execute Python programs
CO4: Interpret Object Oriented Programming using Python
CO5: Design and program Python applications
CO6: Adapt and combine standard algorithms to solve problems

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Semester – II 19BBAC204: Time Series Forecasting Credits: 3 Hours: 60

Learning Objective
The objective of the course is
LO1: To understand various forecasting methods that includes obtaining the relevant data and carrying out the necessary computation
LO2: To equip students with various forecasting techniques
LO3: To gain knowledge on modern statistical methods for analyzing time series data
LO4: To enable students to use data for solving business and transactional problems
LO5: To understand and analyze complex multifactor data sets

Unit-1 Introduction to Time Series Analysis (12 h)

Unit-2 Models and Forecast for Time Series Data (12 h)
Additive model - multiplicative model, Editing of Time Series, Measurement of Seasonal Variation - Seasonal average method - Seasonal variation through moving averages - Chain or link relative method - Ratio to trend method, Forecasting Methods Using Time Series - Mean forecast - Naive forecast - Linear trend forecast - Non-linear trend forecast - Forecasting with exponential smoothing.

Unit-3 Vector Auto Regression Model (VAR) (12 h)
Estimation and Identification, - Variance decomposition and Impulse response functions, - Causality applying Granger Causality Tests and VAR model, - Forecasting using a VAR model.

Unit-4 Stochastic Process (12 h)
Stochastic process and its main characteristics - Stochastic process - Time series as a discrete stochastic process – Stationarity - Main characteristics of stochastic processes (means, auto co-variation and autocorrelation functions) - Stationary stochastic processes - Stationarity as the main characteristic of stochastic component of time series.

Unit-5 Linear Time Series (12 h)

Text Books
Supplementary Readings

Course Outcome
Upon completing this course, the student will be able to
CO1: Understand the various forecasting techniques and its advantages
CO2: Generate prediction equations to predict business behaviour based on critical inputs
CO3: Appreciate the fundamental advantage and necessity of forecasting in various situations
CO4: Apply knowledge to diagnose and solve problems in diverse situations
CO5: Choose an appropriate forecasting method in a particular environment
CO6: Improve forecast with better statistical models based on statistics

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Semester – II 19BBAE206: Data Science Credits: 4 Hours: 60

Learning Objective
The objective of the course is
LO1: To know to derive meaning form huge volume of data and information
LO2: To work through all stages of a data mining methodology.
LO3: To enable students to effectively identify sources of data and process it for data mining
LO4: To make students well versed in all data mining algorithms, methods of evaluation
LO5: To develop competence in data mining applications

Unit-1 Introduction to Data Mining (12 h)
Data mining, Text mining, Web mining, Spatial mining, Process mining, BI process- Private and Public intelligence, Strategic assessment of implementing

Unit-2 Data Warehousing (12 h)
Data ware house – characteristics and view - OLTP and OLAP - Design and development of data warehouse, Meta data models, Extract/ Transform / Load (ETL) design.

Unit-3 Data Mining Tools, Methods and Techniques (12 h)
Regression and correlation; Classification- Decision trees; clustering –Neural networks; Market basket analysis- Association rules-Genetic algorithms and link analysis, Support Vector Machine, Ant Colony Optimization

Unit-4 Modern Information Technology & Its Business Opportunities (12 h)
Business intelligence software, BI on web, Ethical and legal limits, Industrial espionage, modern techniques of crypto analysis, managing and organizing for an effective BI Team

Unit-5 BI and Data Mining Applications (12 h)
Applications in various sectors – Retailing, CRM, Banking, Stock Pricing, Production, Crime, Genetics, Medical, Pharmaceutical field
Text Books
1. Anil Maheshwari, Data Analytics Made Accessible, Kindle edition, 2019

Supplementary Readings
1. Jiawei Han, Micheline Kamber and Jian Pei, Data Mining: Concepts and Techniques, 3rd ed., Morgan Kaufmann Publishers, 2012

Course Outcome
Upon completing this course, the student will be able to
CO1: Demonstrate an understanding of the importance of data mining and the principles of business intelligence
CO2: Appreciate the merits and demerits of various data mining models, tools & techniques
CO3: Design and develop Data warehouses
CO4: Apply Data mining techniques to match business objectives and add value to business
CO5: Define and apply metrics to measure the performance of various data mining algorithms
CO6: Apply BI to solve practical problems, interpret and visualize the results and provide decision support

Outcome Mapping

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Semester – II

19BBAE207 Business Intelligence – Big Data & Cloud Computing

Credits: 4
Hours: 60

Learning Objective
The objective of the course is
LO1: To provide foundational knowledge associated with the Cloud Computing
LO2: To acclimatize with different cloud programming platforms and tools
LO3: To understand big data analysis tools and techniques
LO4: To provide the knowledge based on the development of Cloud Service
LO5: To learn the applications of Cloud Computing

Unit-1 Understanding Cloud Computing (12 h)

Unit-2 Developing Cloud Services (12 h)
Unit-3  Cloud Computing For Everyone (12 h)
Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation

Unit-4  Using Cloud Services (12 h)

Unit-5  Other Ways to Collaborate Online (12 h)

Text Books

Supplementary Readings

Course Outcome
Upon completing this course, the student will be able to
CO1: Understand the principles of Business Intelligence and Big data
CO2: Identify problems, and explain, analyze, and evaluate various cloud computing solutions
CO3: Explain and identify the techniques of big data analysis in cloud
CO4: Choose appropriate technologies, algorithms, and approaches for the related issues
CO5: Compare the applications of Collaborating using Cloud Service
CO6: Apply Business Intelligence methods that support decision process in business operations

Outcome Mapping

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Course Objective
Students should undergo an observational study to learn from either, small and medium business units or from online resources. They should get versatile exposure in big data analysis using various data available in the establishments or they may get exposure in doing analysis with data available from social media or online resources. They can make use of second semester evening hours and weekends to undergo the study. They are expected to submit a report of their study for evaluation.

Applied project evaluation in big data analysis will be done for 100 marks which includes Dissertation (75 marks) and Viva voce (25 marks) and the minimum requirement for passing the project is 50 marks. A periodical review will be carried out to assess the originality of the project.

Guidelines
- The duration of the study is 40 hours.
- The students have to select a small and medium business units or from online resources.
- Students have to visit the enterprise during the evening hours or on leave days to complete the project if they select a business unit.
- Important concepts related to business analytics have to be studied and the same have to be reported.
- Students have to submit the report about the project they are involved in.
- Students should get the attendance from the firm and attach the same in the report if they do study in business unit.
- Students are allotted a guide in the department.
- Frequent discussions have to be made with the guide for the completion of the project.
Learning Objective
The objective of the course is
LO1: To provide the basics of data visualization techniques namely Hadoop and Tableu
LO2: To get hands-on experience to work with Data Visualization techniques
LO3: To understand the concepts related to Hadoop Ecosystem and Yarn
LO4: To get exposure to Tableu user interface and data connection
LO5: To attain knowledge on group and hierarchies in datasets

Unit-1 Introduction to HADOOP (12 h)
Big Data – Apache Hadoop & Hadoop Eco System – Moving Data in and out of Hadoop –
Understanding inputs and outputs of Map Reduce - Data Serialization

Unit-2 HADOOP Architecture (12 h)
Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands , Anatomy of
File Write and Read., Name Node, Secondary Name Node, and Data Node, Hadoop Map Reduce
paradigm, Map and Reduce tasks, Job, Task trackers - Cluster Setup – SSH &Hadoop
Configuration – HDFS Administering –Monitoring & Maintenance.

Unit-3 HADOOP Ecosystem AND Yarn (12 h)
Hadoop ecosystem components - Schedulers - Fair and Capacity, Hadoop 2.0 New Features
Name Node High Availability, HDFS Federation, MRv2, YARN, Running MRv1 in YARN

Unit-4 Introduction to TABLEAU (12 h)
Introduction to Tableau 8 - Tableau User Interface - Basic Tableau Design Flow - Basic
Visualization Design - Show Me! choosing Mark Types color - Size, and Shape Options - shaped
Axis Charts-combination Charts - Measure Names - Measure Values - Data Connection -
Connecting to Various Data Sources - Customizing Your View of the DataSets

Unit-5 GROUPS – HIERARCHIES (12 h)
Groups – Hierarchies - Extracting Data - Data Blending - Top 10 Chart - Bar Chart, Line Chart -
Area Chart - Text Table/Cross Tab - Scatter Plot/Bubble Chart - Bullet Chart, Box Plot- Tree Map -
Pie Chart - World Cloud - Tableau maps - Geocoded Fields - Dashboard Actions - Distributing and
Sharing Your Dashboards - Exporting Worksheets and Dashboards
Publishing to Tableau Server - Creating Tableau Server User Filters - Smartphones and Tablets
with iOS and Android

Text Books
1. Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, “Professional Hadoop Solutions”,

Supplementary Readings
2. "Information Dashboard Design: Displaying Data for At-a-glance Monitoring" by Stephen
Few 2010
3. "Beautiful Visualization, Looking at Data Through the Eyes of Experts by Julie Steele, Noah
Iliinsky" 2010

Course Outcome
After completing the course, students will be familiar with
CO1: the basics of data visualization techniques namely Hadoop and Tableu
CO2: working with data visualization techniques
CO3: understanding the concepts related to Hadoop Ecosystem and Yarn
CO4: getting exposure to Tableu user interface and data connection
CO5: knowledge on groups and hierarchies in datasets
CO6: distributing, sharing and exporting worksheets and dashboards

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Semester – III  19BBAC302: E-Governance And Cyber Law  Credits: 3  Hours: 60

**Learning Objective**
The objective of the course is

LO1: To introduce the cyber world and cyber law in general
LO2: To explain about the various facets of cyber crimes
LO3: To enhance the understanding of problems arising out of online transactions and provoke them to find solutions
LO4: To clarify the Intellectual Property issues in the cyber space and the growth and development of the law in this regard,
LO5: To educate about the regulation of cyber space at national and international level.

**Unit-1 Introduction to Web Technology (12 h)**

**Unit-2 International Cyber Law (12 h)**
Cyber Law - International Perspectives, UN & International Telecommunication Union (ITU) Initiatives, Council of Europe - Budapest Convention on Cybercrime, Asia-Pacific Economic Cooperation (APEC), Organization for Economic Co-operation and Development (OECD), World Bank, Commonwealth of Nations

**Unit-3 Cyber Crimes & Legal Framework (12 h)**

**Unit-4 Dispute in Cyberspace (12 h)**

**Unit-5 Ethics and Business (12 h)**

**Text Books**

**Supplementary Readings**

Course Outcome
After completing the course, students will be familiar with
CO1: Understanding concepts related to cyber world and cyber law in general
CO2: Develop competitive edge on various facets of cyber crimes
CO3: Problems arising out of online transactions and provoke them to find solutions
CO4: Intellectual property issues in the cyber space and the growth and development of the law
CO5: Regulation of cyber space at national and international level.
CO6: Upholding ethical standards in cyber laws and intellectual property issues

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Semester – III  19BBAC303: SOFT SKILLS  Credits: 3  Hours: 60

Learning Objective
The objective of the course is
LO1: To enable students to better understand themselves and the importance of soft skills in order to meet the professional expertise and its competitiveness with necessary skills
LO2: To improve their communication skills both in oral and written
LO3: To enhance the employability skills of the students like goal setting, career planning, etc
LO4: To understand the concepts of emotional intelligence, team building and team spirit at work place
LO5: To make familiar with the decision making skills of the students so as to take right decision at right time

Unit-1 Soft Skill and Personality Development (12 h)
Soft skills – Meaning and Importance, Self concept - Self awareness, Self development, Know Thyself – Power of positive attitude – Etiquette and Manners
Listening – Types of Listening – Effective Listening – Barriers to Listening – Assertive communication

Unit-2 Communication Skills (12 h)

Unit-3 Interpersonal Skills (12 h)
Interpersonal skills – Relationship development and maintenance – Transactional Analysis Conflict resolution skills – levels of conflict – handling conflict - Persuasion – Empathy – Managing emotions – Negotiation – types, stages & skills – Counselling skills

Unit-4 Employability Skills (12 h)
Goal setting – Career planning – Corporate skills – Group discussion – Interview skills – Types of Interview - Interview body language - E-mail writing – Job application – cover letter - Resume preparation

Unit-5 Work Skills (12 h)

Text Books

Supplementary Readings

Course Outcome
After completing this course the students will be familiar with
CO1: Better understanding on themselves and know the importance of soft skills in order to meet the professional expertise and its competitiveness with necessary skills
CO2: Communication skills both in oral and written
CO3: Employability skills of the students like goal setting, career planning, etc.
CO4: Understanding the concepts of emotional intelligence, team building and team spirit at work place
CO5: Decision making skills of the students so as to take right decision at right time
CO6: Commitment to sustainable development using various skills

Outcome Mapping

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Semester – III 19BBAC304: SQL (Practical) Credits: 3 Hours: 60

Learning Objective
The objective of the course is
LO1: To provide foundational knowledge on SQL
LO2: To familiarize the students with all concepts of SQL, exception handling
LO3: To understand the process of using and managing functions
LO4: To get familiar with the process of using, creating and managing packages
LO5: To practice various commands in SQL

Unit-1 Introduction to PL/SQL (12 h)

Unit-2 Program Structures to Control Execution Flow (12 h)

Unit-3 Exception Handling (12 h)

Unit-4 Using and Managing Functions (12 h)

Unit-5 Improving PL/SQL Performance (12 h)

Text Books

Supplementary Readings

Course Outcome
After completing this course the students will be familiar with
CO1: Analyzing foundational knowledge on SQL
CO2: Managing all concepts of SQL, exception handling
CO3: Understanding the process of using and managing functions
CO4: The process of using, creating and managing packages
CO5: Practicing various commands in SQL
CO6: Effective communication with computers in machine language
### Outcome Mapping

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### Learning Objective

The objective of the course is:

- LO1: To provide fundamental knowledge on predictive analysis and modeling
- LO2: To familiarize the students with the concepts of sampling multivariate design and analysis
- LO3: To get insights into sampling design, tools and techniques
- LO4: To understand the predictive analysis concepts like simple linear regression and logistics and multinomial regression
- LO5: To know the applications of predictive analysis in various functional areas

### Unit-1

**Conceptual foundations of research (12 h)**


### Unit-2

**Sampling Design and Tools (12 h)**


### Unit-3

**Multivariate Designs and Analysis (12 h)**

Introduction to Multivariate methods and analysis, Discriminant Analysis Multiple, logistic and hierarchical regression Factor analysis, structural equation modeling (SEM), Meta analysis, Mediational Analysis, Canonical Analysis. Advantages of multivariate strategies

### Unit-4

**Predictive analysis (12 h)**

Simple linear regression: Coefficient of determination, Significance tests, Residual analysis, Confidence and Prediction intervals Multiple linear regression: Coefficient of multiple coefficient of determination, Interpretation of regression coefficients, Categorical variables, heteroscedasticity, Multi-collinearity, outliers, Auto regression and Transformation of variables

### Unit-5

**Logistic and Multinomial Regression (12 h)**

Logistic and Multinomial Regression: Logistic function, Estimation of probability using logistic regression, Deviance, Wald Test, Hosmer Lemshow Test Forecasting: Moving average, Exponential smoothing, Trend, Cyclical and seasonality components, ARIMA (autoregressive integrated moving average). Application of predictive analytics in retail, direct marketing, health care, financial services, insurance, supply chain, etc.

### Text Books


Supplementary Readings

Course Outcome
After completing the course, students will be familiar with
CO1: fundamental knowledge on predictive analysis and modeling
CO2: the concepts of sampling multivariate design and analysis
CO3: getting insights into sampling design, tools and techniques
CO4: the predictive analysis concepts like simple linear regression and logistics and multinomial regression
CO5: the applications of predictive analysis in various functional areas
CO6: cultivating aptitude in designing the framework of quantitative research

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Semester – III

19BBAE307: Business Optimization

Learning Objective
The objective of the course is
LO1: To provide foundational knowledge associated with the domain of business optimization and analytics
LO2: To get exposure to solution for business related problems with the help of linear programming models and methods
LO3: To get hands on experience in optimization using Excel to solve business problems
LO4: To familiarize the students with all concepts of optimization techniques
LO5: To understand the simulation for analytics, and process mining

Unit-1 Modeling (12 h)

Unit-2 Linear Programming (12 h)

Unit-3 Visualization (12 h)
Visualization, Organization/sources of data, Importance of data quality. Dealing with missing or incomplete data, Data Classification

Unit-4 Decision modeling (12 h)
Decision modeling, Optimization Use of Excel to solve business problems: e.g. marketing mix, capital budgeting, portfolio optimization, Goal programming; pareto optimality and trade-off curves; the Analytic Hierarchy Process (AHP)

Unit-5 Process Mining (12 h)
Process Mining, Concept and content of workflow logs; discovering the underlying process; discovering exceptions. Process Mining (Course Notes). ProM - process mining toolkit

Text Books

Supplementary Readings

Course Outcome
After completing the course, students will be familiar with
CO1: foundational knowledge associated with the domain of business optimization and analytics
CO2: getting exposure to solution for business related problems with the help of linear programming models and methods
CO3: getting hands on experience in optimization using Excel to solve business problems
CO4: all concepts of optimization techniques
CO5: the simulation for analytics and process mining
CO6: optimizing business using critical thinking process with the help of different mathematical models

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Project Training

Summer project is an on-the-job training that inculcates practical knowledge and improves performance by giving an insight into business realities. As a part of the curriculum, the project is intended to input practical and conceptual knowledge to the students which is to be carried out for 45 days during May–June.

A committee is constituted for the overall Co-ordination of the students. The students undertake projects in various business analytics firms all over the country. Faculty members also render their help in finding project placements at various business analytics firms. Students will be allotted faculty guides and they are advised to undertake projects based on their individual area of specialization. The topics are selected by consulting with their project guides and company guides.

MBA project End Semester Evaluation will be done for 75 marks which includes Dissertation (50 marks) and Viva voce (25 marks) and the minimum requirement for passing the project is 38 marks. The internal assessment evaluation carries 25 marks that constitute two reviews (I review-10 marks and II review-15 marks) and the minimum requirement for passing the internal evaluation is 12 marks. Overall the minimum passing requirement for the project is 50 marks.

A Project Evaluation Committee will be formed comprising the Head of the Department, Project Supervisor, and a senior faculty.

Project Related Activities
- Project discussions for students with their guides have to be made once in a week.
- Students can make use of the computer lab facilities for execution of their project work and for preparation of their report.
- Frequent workshops and review meetings will be conducted with trainers and experts of various disciplines.
- A formal interim – project presentation will be held before their juniors. This presentation acts as a good ground of experience on the part of the presenters while a good beginning of insight for the juniors.
- A mock viva–voce will be held before appearing for their main project viva–voce examination to gain an experience.
- Best Project Contest will be conducted every year to provide a platform to exhibit the skills they have acquired during the summer project training.
- Students are encouraged to participate in the National Level Project contest held at various institutions.
- Students are also encouraged to work towards publishing a paper along with the help of their faculty guide to add a real value to their project work.
Semester – IV

19BBAC401: Operations And Supply Chain Analytics  
Credits: 3  
Hours: 60

Learning Objective
The objective of the course is
LO1: To provide foundational knowledge associated with the operations analytics
LO2: To provide foundational knowledge associated with the supply chain analytics
LO3: To describe the various tools and techniques for implementation of analytics based on the
    supply chain drivers such as location, logistics and inventory
LO4: To describe the various techniques for analytics based on the Multi Attribute Decision
    Making (MADM) and risk
LO5: To provide the applications of analytics in operations and supply chain

Unit-1 Warehousing Decisions (12 h)
Warehousing Decisions, Mathematical Programming Models, P-Median Methods, Guided LP
Approach, Balmer – Wolfe Method, Greedy Drop Heuristics, Dynamic Location Models, Space
Determination and Layout Methods

Unit-2 Inventory Management (12 h)
Inventory Management, Inventory aggregation Models, Dynamic Lot sizing Methods, Multi-Echelon
Inventory models, Aggregate Inventory system and LIMIT, Transportation Network Models, Notion
of Graphs, Minimal Spanning Tree,

Unit-3 Path Algorithms (12 h)
Shortest Path Algorithms, Maximal Flow Problems, Multistage Transshipment and Transportation
Problems, Set covering and Set Partitioning Problems, Traveling Salesman Algorithms, Advanced
Vehicle Routing Problem Heuristics, Scheduling Algorithms-Deficit function Approach and Linking
Algorithms

Unit-4 Data Envelopment Analysis (12 h)
Analytic Hierarchy Process, Data Envelopment Analysis, Risk Analysis in Supply Chain, Measuring
transit risks, supply risks, delivering risks

Unit-5 Application in SCM (12 h)
Risk pooling strategies, Fuzzy Logic and Techniques-Application in SCM

Text Books
1. Khalid Zidan, Supply Chain Management: Fundamentals, Strategy, Analytics & Planning for
2. Chan, Hing Kai, Subramanian, Nachiappan, Abdulrahman and Muhammad Dan-Asabe,
   Supply Chain Management in the Big Data Era, IGI Global. 2016

Supplementary Readings
1. GerardFeigin, Supply Chain planning and analytics – The right product in the right place at
   the right time, Business Expert Press, 2011
   Improvement Using the SCOR Model, AMACOM Div American MgmtAssn, 2007
3. Robert Penn Burrows, Lora Cecere, Gregory P. Hackett, The Market-Driven Supply Chain:
   A Revolutionary Model for Sales and Operations Planning in the New On-Demand
   Economy, AMACOM Div American Mgmt Assn, 2001

Course Outcomes
After completing this course, the student will learn
CO1: To recognize on the fundamental concepts of location and layout.
CO2: To understand on the implementation of analytics in location and layout.
CO3: To understand the inventory techniques for analytics.
CO4: To analyze the inventory using aggregate production model
CO5: To identify the different network models.
To Analyze the role and applications of Descriptive Analytics in a Supply Chain

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Semester – IV

19BBAC402: Human Resource Analytics

Credits: 3
Hours: 60

Learning Objective

The objective of the course is

LO1: To understand the concepts, tools and techniques of HR Analytics that could be applied as resource management evidence based.

LO2: To understand HR reports & to understand the decisions technologies.

LO3: Recognize the fundamental strategic priorities of the business and learn how to provide enhanced decision support leveraging analytics.

LO4: Develop a structured approach to apply judgment, and generate insight from data for enhanced decision making.

Unit-1 Introduction to HR Analytics: (12 h)

Unit-2 Creating business understanding for HR initiatives: (12 h)
Workforce segmentation and search for critical job roles; Statistical driver analysis – association and causation; Linking HR measures to business results; choosing the right measures for scorecards; Identifying and using key HR Metrics.

Unit-3 Forecasting budget numbers for HR costs: (12 h)
Workforce planning including internal mobility and career pathing; training and development requirement forecasting and measuring the value and results of improvement initiatives; optimizing selection and promotion decisions

Unit-4 Predictive modelling in HR: (12 h)
Employee retention and turnover; workforce productivity and performance; scenario planning.

Unit-5 Communicating with data and visuals (12 h)
Data requirements; identifying data needs and gathering data; HR data quality, validity and consistency; Using historical data; Data exploration; Data visualization; Association between variables; Insights from reports; Root cause analysis of HR issues

Text Books


Supplementary Readings

2. The New HR Analytics: Predicting the Economic Value of Your Company's Human Capital Investments: Predicting the Economic Value of Your Company's Human Capital Investments Hardcover – Import, 1 Jun 2010,
Course Outcome
After completing this course, the student will be able to

CO1: Analyse appropriate internal and external human resource metrics benchmarks and indicators.

CO2: Operate relational databases and make recommendations regarding the appropriate HRIS to meet organization's human resource needs.

CO3: Employ appropriate software to record, maintain, retrieve and analyse human resources information (e.g., staffing, skills, performance ratings and compensation information).

CO4: Apply quantitative and qualitative analysis to understand trends and indicators in human resource data; understand and apply various statistical analysis methods

CO5: Manage information technology to enhance the efficiency and effectiveness of human resource functions within the organization.

CO6: Analyse the Employee work history & Multi-rater reviews

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Semester – IV 19BBAC403: Finance And Risk Analytics

Credits: 3
Hours: 60

Learning Objective
The objective of the course is

LO1: To provide hands on experience in financial statement analysis.

LO2: To expose to general tools of financial analysis, theoretical concepts, and practical valuation issues.

LO3: To be comfortable with using firm’s financial statements to develop understanding of their performance and to establish basis for making reasonable evaluation estimates.

LO4: To identify the value-relevant information contained within financial statements;

LO5: To understand the impact of financial reporting choices on the usefulness of reported earnings to predict future performance

Unit-1 Introduction to financial analysis (12 h)
Finance and accounting – meaning – Types of companies - Financial statement analysis – on the basis of materials used – on the basis of modus operandi – Comparing financial and non-financial listed companies performance through annual as a bench marking against competitor and industry.

Unit-2 Financial analysis through ratios (12 h)

Unit-3 Prospective and Credit analysis (12 h)

Unit 4  M & A and Equity analysis (12 h)

Unit 5  Financial reporting (12 h)
Financial reporting – Concepts – users, Objectives of financial reporting – Qualitative characteristics of information in financial reporting – basic problems of disclosure – Role of SEBI in IFRS – Statutory disclosures in IFRS – Corporate reporting practices in India-Challenges in financial reporting

Text Books

Supplementary Readings

Course Outcome
After completing this course, the student will be able to
CO1: Describe and apply the basic techniques of financial statement analysis
CO2: Understand the relationship between strategic business analysis, accounting analysis and financial analysis
CO3: Identify and utilise value-relevant information contained within financial statements
CO4: Recognize and explain the fundamental role of accounting numbers in the valuation of entities and the key financial claims on these entities assets (equity and debt securities)
CO5: Understand the impact of financial reporting choices on the usefulness of reported earnings to predict future performance
CO6: To introduces basic concepts of Investment

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Learning Objective
The objective of the course is
LO1: To create an understanding of the use of analytics in Marketing and Retail Management.
LO2: To use the predictive analysis in decision making.
LO3: To Understand the types of positioning strategies followed by the companies.
LO4: To analyze and contrast products and services.
LO5: To understand the various segments for a product.

Unit-1 Introduction to Marketing (12 h)
Understanding the marketplace and consumer needs, Designing a Customer Driven Marketing Strategy, Building Customer Relationships, Consumer Behaviour and Business Buyer Behaviour

Unit-2 Marketing Strategy (12 h)

Unit-3 Product and Service (12 h)
Products and services, product and service classifications, consumer products, industrial products, product and service decisions, product and service attributes, product support services, services marketing – the nature and characteristics of a service

Unit-4 Retail Analytics – I (12 h)
Customer Analytics Overview; Quantifying Customer Value, Using Stata for Basic Customer Analysis. Predicting Response with RFM Analysis, Statistics Review, Predicting Response with Logistic Regression, Predicting Response with Neural Networks, Predicting Response with Decision Trees.

Unit-5 Retail Analytics – II (12 h)
The digital evolution of retail marketing, Digital natives, Constant connectivity Social interaction, Predictive modeling, Keeping track, Data availability, Efficiency optimization.

Text Books

Supplementary Readings

Course Outcome
After completing this course, the student will learn
CO1: To understand the market place and the changing consumer needs.
CO2: To identify various methods followed to build CRM practices.
CO3: To recognize the various segments for a product.
CO4: To identify the various positioning strategies followed by the companies.
CO5: To compare and contrast products and services.
CO6: To Understand the Role of Analytics in Retail sector

Semester – IV 19BBAC404: Marketing And Retail Analytics Credits: 3 Hours: 60
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**Semester – IV**  
**19BBAE406: Machine Learning**  
**Credits: 4**  
**Hours: 60**

**Learning Objective**  
The objective of the course is  
LO1: To understand the basic theory underlying machine learning.  
LO2: To be able to formulate machine learning problems corresponding to different applications.  
LO3: To understand a range of machine learning algorithms along with their strengths and weaknesses.  
LO4: To be able to apply machine learning algorithms to solve problems of moderate complexity.  
LO5: To apply the algorithms to a real-world problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models.

**Unit-1 Introduction (12 h)**  

**Unit-2 Neural Networks and Genetic Algorithms (12 h)**  

**Unit-3 Bayesian and Computational Learning (12 h)**  

**Unit-4 Instant Based Learning (12 h)**  
K- Nearest Neighbour Learning – Locally weighted Regression – Radial Bases Functions – Case Based Learning.

**UNIT V Advanced Learning (12 h)**  

**Text Books**  

**Supplementary Readings**  
Course Outcome
After completing this course, the student will be able to
CO1: Appreciate the importance of visualization in the data analytics solution
CO2: Apply structured thinking to unstructured problems
CO3: Understand a very broad collection of machine learning algorithms and problems
CO4: Learn algorithmic topics of machine learning and mathematically deep enough to introduce the required theory
CO5: Develop an appreciation for what is involved in learning from data.

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Semester – IV

19BBAE407: Social & Web Analytics
Credits: 4
Hours: 60

Learning Objective
The objective of the course is
LO1: To understand how big data principles implemented in Social media & Web
LO2: To understand the data processing for Social media & Web analytics
LO3: To describe the different metrics for Social media & Web analytics
LO4: To understand the application for Social media & Web analytics
LO5: To analyze the types of data for Social media & Web analytics.

Unit-1 Introduction (12 h)

Unit-2 Web analytics (12 h)
Web analytics 2.0 framework (clickstream, multiple outcomes analysis, experimentation and testing, voice of customer, competitive intelligence, Insights) - Experimental methods in web data analytics - Air France Internet Marketing Case Study - Econometric modeling of search engine ads.

Unit-3 Structured data Vs unstructured data (12 h)
Data (Structured data, unstructured data, metadata, Big Data and Linked Data) - Lab testing and experiment design (selecting participants, within-subjects or between subjects study, counterbalancing, independent and dependent variable; A/B testing, multivariate testing, controlled experiments).

Unit-4 Web metrics and web analytic (12 h)
Web metrics and web analytics - PULSE metrics (Page views, Uptime, Latency, Seven-day active users) on business and technical issues; -HEART metrics (Happiness, Engagement, Adoption, Retention, and Task success) on user behaviour issues; - On-site web analytics, off-site web analytics, the goal-signal-metric process.

Unit-5 Social media analytics (12 h)
Social media analytics - Social media analytics (what and why) - Social media KPIs (reach and engagement) - Performing social media analytics (business goal, KPIs, data gathering, analysis, measure and feedback) 6. Data analysis language and tools Cases and examples - User experience measurement cases - Web analytics cases 8. Group work and hands on practice -
Usability study planning and testing; and data analysis using software tools (Google Analytics, Google Sites, R and Deducer)

**Text Books**

**Supplementary Readings**

**Course Outcome**
After completing this course, the student will learn

- **CO1**: To recognize the fundamental concepts of Social media.
- **CO2**: To recognize the fundamental concepts of Web.
- **CO3**: To analyze data obtained from social media.
- **CO4**: To explain the experimental methods in web data analytics.
- **CO5**: To recognize the types of data for Social media & Web analytics.
- **CO6**: To Utilize various Application Programming Interface (API) services to collect data from different social media sources

**Outcome Mapping**

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**Semester – IV**

19BBAC408: Comprehensive Viva-voce
*(Business Analytical and Subjects)*

Credits: 2
# ASSESSMENT PATTERN
## Continuous Internal Evaluation (25 Marks)

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## End Semester Examination (75 Marks)

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