Surana College

AUTONOMOUS

16, South End Road | Bengaluru-04

Reaccredited 'A+' Grade by NAAC | Affiliated to Bengaluru University

1.1.2

Programme Wise Syllabus

Index

Sl. No	Particular	Page. No
1.	Syllabus for BBA	2 - 45
2.	Syllabus for B.Com	46 - 52
3.	Syllabus for BCA	53 - 60
4.	Syllabus for Journalism	61 - 75
5.	Syllabus for BA Tourism	76 - 79
6.	Syllabus for Political Science	80 - 106
7.	Syllabus for History	107 - 129
8.	Syllabus for BA Psychology	130 - 143
9.	Syllabus for Botany	144 - 150
10.	Syllabus for Chemistry	151 - 180
11.	Syllabus for Physics	181 - 196
12.	Syllabus for Biotechnology	197 - 214
13.	Syllabus for Mathematics	215 - 234

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

SURANA COLLEGE-AUTONOMOUS

BACHELOR OF BUSINESS ADMINISTRATION, B.B.A. REGULAR

ACADEMIC REGULATIONS PERTAINING TO B.B.A DEGREE (REGULAR)

(CBCS - SEMESTER SCHEME) 2021-2022.

PREAMBLE

Education is critical for realizing one's full potential, creating a more just and equal community in advancing individual and national progress. In terms of economic growth, social fairness and equality along with scientific advancement, national integration and cultural preservation, the universal access to high-quality education is critical to continue the raise of Indian leadership in the global arena.

Systematic and structural education is the most effective path for developing and exploiting our country's vast skills and resources to benefit individuals, communities, the country, and the globe. Over the next decade, India will have the world's most promising, production of young population, and our capacity to offer them high-quality educational opportunities will decide the country's future.

The cornerstone of National Education Policy (NEP) 2020 is the UN's interrelated 17 Sustainable Development Goals (SDGs), including the fourth objective (SDG-4) on quality education. The NEP intends to induce a paradigm shift by re-conceptualizing higher education as well as re-visioning and redesigning essential components of higher education in India, in line with the UN's goal. The NEP's ideals are in accordance with the objective of education in the 21stcentury. As a result, the NEP emphasizes the development of literacy and numeracy, as well as higher-order cognitive talents such as critical thinking and knowledge to solve social, ethical, and emotional challenges.

The NEP Regulations for Four-Year Undergraduate Program were drafted by the committee over the course of more than three months. The University's Faculty Members were given the opportunity to comment on the proposed NEP rules 2020, which were subsequently approved by the Faculty of Arts, Science and Commerce, and the Academic Council for implementation commencing in the academic year 2021-22.

On this foundation, Surana College-Autonomous is implementing the NEP objectives to advance from the traditional information generation and distribution by integrating those objectives for a breakthrough with broader social and economic implications. As a result, Surana College-Autonomous intends to bring structural changes to its undergraduate and post-graduate programmes to provide students with a diverse set of talents, ambitions, and professional goals.

As per the NEP, the structure and durations of university degree programmes are modified. The undergraduate degree is structured for either three or four years with multiple exit options and appropriate certifications. Students are eligible for obtaining a certificate after one year of study; a

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004

diploma is awarded after two years of study, and a Bachelor's degree is awarded after a three-year programme. Students can pursue a four-year multidisciplinary Bachelor's degree to gain exposure to the whole spectrum of holistic education while focusing on their chosen major and minor areas.

As NEP is based on a Choice Based Credit System (CBCS), the accumulated credits of a student are digitally stored in the Academic Bank of Credit (ABC) system. If a student chooses to transfer to a different Higher Education Institution (HEI) to study a particular topic, previous semester credits will be digitally transferred to the new HEI. The credits earned by the student will be transferable across numerous recognised higher education institutions within the state/country, allowing degrees to be awarded from any of the HEIs based on the credits earned. The 4-year programme may lead to a degree with Research if a student completes a research project as per the curriculum.

Education being significant in building nation, education intuitions accordingly imparting their services. However, an education system to churn out the educated with the global meeting competence is the core objective of the higher education system with the priority of a learner-centric approach. Students are exposed to a wide range of disciplines due to the flexibility of choosing intra-disciplinary, inter-disciplinary, and skill-based courses, resulting in holistic learning and training. This is ensured with the innovated and improved course curriculum with a paradigm shift in pedagogy and evaluation.

Due to the importance of education in developing a nation, educational institutions provide services in this regard. However, the fundamental aim of the higher education system with a learner-centric approach as the priority is to produce students to meet global competence. This is accommodated with the flexibility of choosing intra-disciplinary, inter-disciplinary, and skill-based courses for the students for broad exposure to disciplines resulting in responsible and creative individuals with ethical and constitutional values. Further, it imparts intellectual curiosity, the spirit of service, and capabilities across the disciplines such as sciences, social sciences, arts, humanities, and professional, technical, and vocational crafts. Thus, higher education is expected to facilitate the formation of an enlightened, conscientious, informed individual.

For the state of Karnataka, the Karnataka State Higher Education Council has suggested a model curriculum framework and an implementation plan. Its mission is to propose and support implementing plans and programmes that increase academic quality and the state's academic and Research environment. The suggested curricular framework aims to empower students by assisting them in their quest for total excellence.

The four-year Multidisciplinary Undergraduate programme is a significant shift in contemporary undergraduate education by replacing traditional undergraduate programmes. The curriculum is designed on the Outcome-Based Education (OBE) approach. As a result, Surana

College-Autonomous decided to replace current undergraduate degree programmes in the Faculties of Arts, Science, Commerce, and Management with multidisciplinary and holistic education in all under-graduate and post-graduate programmes, with multiple entry and exit options.

This Multidisciplinary Undergraduate programme aims to improve the student's community with the implementation of flexible and creative curricula. This encompasses a wide variety of disciplines in order to expose students to a broad range of information and experience while focusing on one or two areas in particular. The curriculum would fulfil the significant knowledge criteria for vocational, professional, and skill development since it incorporates humanities, arts, social, physical, and mathematical sciences, life sciences, sports, and culture.

Hence the regulations

TITLE

a) The regulations shall be called "The Regulations Governing the Choice Based Credit System Semester Scheme with Multiple Entry and Exit Options in Undergraduate and Postgraduate Degree Programmes in the Faculties of Arts, Science, Commerce and Management prepared by Bangalore University, adopted by Surana College-Autonomous".
b) These regulations shall come into force from the Academic Year 2021-22

SALIENT FEATURES OF FOUR YEARS MULTIDISCIPLINARY UG PROGRAMME

a) Students at the end of the second, fourth and sixth semester of a degree programme exit options are provided with certification, diploma and basic Bachelor's degrees. Students will receive a Bachelor's degree with Honours on successfully completing all eight semesters of the Undergraduate Program either at a stretch or with opted exits and re-entries.
b) Students who are eligible for Doctoral/Research Programme should have a Four-Year Undergraduate Honours Degree with compulsory research component paper and the students of Two Semester Master's Degree with compulsory Project Work in the relevant subjects.
c) Students who wish to pursue a Master's or Doctorate in a discipline other than the major subject studied in undergraduate programmes must take additional course/s for the new discipline, which is not pursued in the previously completed course for eligibility.
d) Students can have exit options in Five-Years Integrated Master's Degree programme at the end of the third-year programme with a Bachelor's degree and the end of the fourth year with a Bachelor's Honours degree.
e) There may also be an integrated doctoral programme with an exit option at the end of the first year with the Master's degree.
f) Students who leave with a Certification, Diploma, or a Basic Bachelor's Degree will be eligible to re-enter the programme at the exit level to compete or progress to the next level.

g) The curriculum combines conceptual understanding with practical involvement and thinking to impart applicable knowledge through laboratory experiences, field work, internships, workshops, and research projects.

h) All students must take a few required courses that will help them expand their horizons. In any academic discipline, however, two areas of specialisation allow for in-depth knowledge of the subject.

i) Students select a 'major discipline' and a 'minor discipline' from a list of two disciplines/subjects provided by the institution. Students are expected to gain in-depth disciplinary understanding through theoretical and practical experiences, as well as an adequate knowledge base that is studied as a 'minor discipline'. Students can choose subject combinations across the 'streams.

j) Students are allowed to study two subjects in each semester up to the sixth semester. To acquire an Honours degree, they must select one of the disciplines in the fourth year. On the other hand, if students wish to possess another Honours degree in the second subject studied, they must repeat the fourth year of the course in the second subject as a major.

k) The students may study two disciplines at the same level or breadth up to the sixth semester and choose one of them for study in the fourth year to obtain the Honours degree in that discipline. A student who wishes to get dual degrees may repeat the fourth year of the program in the second discipline.

l) In the undergraduate degree, students might concentrate on one discipline, a vocational field or Teacher Education. They will obtain an Honours degree in either the discipline or the vocational subject/Teacher Education or both.

m) Skills must be explicitly integrated, prominently exhibited, taught in context, and evaluated explicitly. The skills shall include language, communication and life skills, and working in various teams such as critical thinking, problem-solving and data analysis.

n) Students will have the option of selecting courses from a range of alternatives available at the school. There will be no constraint in the subject combinations.

In terms of academic standards and assessment methods, the four-year CBCS maintains output up to date with worldwide trends. Surana College- Autonomous must consider adopting this strategy in globalizing Indian higher education so that students can travel both inside and outside of geographical domains.

THE SALIENT FEATURES OF THE CREDIT-BASED SEMESTER SCHEME

Each course carries a defined number of credits. The credits are based on the course structure, including the teaching mode and the number of contact hours for lecture, tutorial, and practical classes. One hour of theory/tutorial teaching per week equals one credit, and two hours of

laboratory/demonstration classes per week equals one credit. Credits are considered based on the number of contact hours, course content, teaching methodology, allotted 6 maximum marks. While calculating the grading, one credit is equal to 25 marks in a semester. Thus, a 3 or 4 credit course will receive 100 marks, a 2-credit course would receive 50 marks, and a single credit course will receive 25 marks. The proportion of marks earned in a course and the credits given to that course are used to calculate the Semester Grade Point Average (SGPA) or Cumulative Grade Point Average (CGPA). There will be 140 credits in a three-year or six-semester undergraduate programme, 180 credits in a four-year or eight-semester Honours degree programme, and 220 credits in a five year or ten-semester Master's degree programme.

The general features of the Credit Based Semester Scheme are:

a) Credits are used to quantify the relative value of the subjects
b) The subjects of study include foundation, core& skill development courses.
c) The programme permits horizontal mobility in course selections
d) The students shall take part in co-curricular and extension activities
e) The result will be declared based on Semester Grade Point Average (SGPA), or Cumulative Grade Point Average (CGPA) earned.

DEFINITIONS OF KEY WORDS

- **Academic Year**: Two consecutive (one odd + one even) semesters constitute one academic year.
- **Choice Based Credit System (CBCS):** The CBCS provides options for students to select courses from the prescribed courses (core, open elective, discipline elective, ability and skill enhancement language, soft skill courses and soon).
- **Course:** Usually referred to as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work / field work / project work/ vocational training/viva/ seminars/term papers /assignments/ presentations / self-study or a combination of some of these.
- **Credit-Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree /diploma /certificate is prescribed in terms of the number of credits to be earned.
- **Credit**: A unit by which the course work is measured. It determines the number of hours of instructions required per week in a semester. One credit is equivalent to one hour of lecture or tutorial or two hours of practical work/field work per week in a semester. It will generally be equal to 13-15 hours of instructions
- **Grade Point**: It is a numerical weight allotted to each letter grade on a 10-point scale.
- **Credit Point**: It is the product of grade points and the number of credits for a course.

- **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.
- **Programme**: A programme leading to the award of a degree, diploma or Certificate.
- **Semester:** Each semester will consist of over 16 weeks of academic work equivalent to 90actual teaching days. The odd semester may be generally scheduled from June to November and even semester from January to May.
- **Semester Grade Point Average (SGPA**): It is a measure of performance of work done in a semester. It is the ratio of total credit points secured by a student in various courses registered in a semester and the full course credits taken during that semester. It shall be expressed up to two decimal places.
- **Cumulative Grade Point Average (CGPA):** It measures the overall cumulative performance of a student over all the semesters of a programme. The CGPA is the ratio of total credit points secured by a student in various courses in all the semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
- **Transcript or Grade Card or Certificate**: Based on the grades earned, a graded certificate shall be issued to all the registered students after every semester. The grade certificate will display the course details (code, title, number of credits, grade secured).

PROGRAMME

Faculty of Commerce

Bachelor of Business Administration, B.B.A., Bachelor of Business Administration with Honours, B.B.A. (Hons.)

INTRODUCTION

The role of a manager in changing world can never be over emphasized. For a vast country like India and a dynamic world, there is an ever-growing demand for professionals with the right academic background in the field of management studies. A practical learning in management involves appreciation of real-world dynamics and grassroot principles across functional areas. The 21st century workplace demands niche knowledge, finesse in execution, an entrepreneurial mind-set and a global approach towards business organisation. Ultimately, the vantage accrues to those who bring inspiration, commitment and competence to their workplace. Department of management studies keeps this market dynamics and functions towards the society.

The curriculum framework for B.B.A. degree is structured to offer a broad outline that helps in understanding the creative potential of new career growth opportunities based on changing industrial and societal needs. The course is upgraded keeping in mind the aspirations of students, changing nature of the subject as well as the learning environment. The syllabus under NEP-2020 is expected to enhance the level of understanding among students and maintain the high standards of graduate

program offered in the country. The major objective of the graduate program is to elevate the subject knowledge among students, and making them as critical thinkers thereby students can address the issues related to industry and other business sectors. In a nutshell, the course serves as plethora of opportunities in different fields right from accounting, financial markets, marketing, human resource management, Entrepreneurship, research & development, Business analytics.

PROGRAM OUTCOME:

PO	PARTICULARS
PO-1	The syllabus is based on interdisciplinary and integrated curriculum due to which student will acquire quality education & be capable of making a positive contribution to business, trade & industry in the national & global context.
PO-2	To provide adequate basic understanding about Management Education among the students.
PO-3	The program aims at developing a student's intellectual ability, executive personality and management skills through an appropriate blending of business and general education.
PO-4	Focuses on training that brings about changes in thinking and behavior by emphasizing on the fundamental aspects of learning that are crucial for the survival in the challenging and evolving competitive market scenario.
PO-5	To train the students in communication skills effectively& develop organizing & leadership skills by organizing events.
PO-6	To provide holistic understanding of the dynamic business environment.
PO-7	The program will help students to Act with global, ethical, societal, ecological, and commercial awareness expected of practicing management professionals.
PO-8	To train the students to take up marketing, finance, human resource function of various/ different organizations.
PO-9	The holistic outlook of the program with a number of value-based and personality development courses ensures that students are groomed into up-to-date, assertive and effective business executives with strong leadership skills and social consciousness
PO-10	To motivate students to take up higher studies in India & abroad.
PO-11	To embed entrepreneurship qualities/skills like Manage people, process, and resources within a diverse organization required to be a successful individual / an entrepreneur.

PO-12	At the end of the Bachelors in Business Administration program, students would become Knowledgeable across disciplines with a kaleidoscopic view.

ELIGIBILITY FOR ADMISSION:

Candidates who have completed Two years Pre – University course of Karnataka State or its equivalent from any Indian or Foreign approved education board or institution are eligible for admission into this course as notified by the University from time to time.

DURATION OF THE COURSE:

- The course of study is four (04) years of Eight Semesters with Multiple Entry and Exit Options. A candidate shall complete his/her degree within eight (08) academic years from the date of his/her admission to the first semester. However,
- Students successfully complete one (01) year of the course and leave the course, will be awarded certificate of completion,
- Students successfully complete Two (02) years of the course and leave the course, will be awarded Diploma in Management,
- Students successfully completes Three (03) years of the course will be awarded Bachelor Degree in Administration (B.B.A).
- An option is provided to the students to continue the course to the Fourth year and those who successfully complete the Fourth year will be awarded Bachelor's Degree in Management (Hon.) {B.B.A, (Hon)
- Students shall be given options to choose courses from a basket of courses which the institution is capable of offering. There shall be no rigidity of combination of subjects.
- Each semester shall consist of at least 16 weeks of study with a minimum of 90 working days (excluding the time spent for the conduct of final examination of each semester).

The progressive curriculum proposed shall position knowledge and skills required on the continuum of novice problem solvers (at the entry-level of the programme) to expert problem solvers (by the time of graduation):

- At the end of the first year – Ability to solve well-defined problems
- At the end of the second year – Ability to solve broadly-defined problems
- At the end of the third year – Ability to solve complex, ill-structured problems, requiring multidisciplinary skills to solve them
- During the fourth year – Experience of workplace problem-solving in the form of internship or Research Experience preparing for higher education or Entrepreneurship Experience

The Integrated Master's Degree Programmes shall extend over Five academic years (Ten Semesters) with exit options with Regular Bachelor Degree after successful completion of Three academic years (Six Semesters) of study and Bachelor Degree with Honours in a discipline/subject at the end of Four academic years (Eight Semesters). Completing five years of integrated Master's Degree Programme would lead to a Master's degree in a subject

MEDIUM OF INSTRUCTION The medium of instruction shall be in English.

THE CREDIT REQUIREMENTS ARE AS FOLLOWS

EXIT WITH	Min. Credits Requirement*	NSQF Level
Certificate at the Successful Completion of First Year (Two Semesters) of Four Years Multidisciplinary UG Degree Programme	**48**	**5**
A Diploma at the Successful Completion of the Second Year (Four Semesters) of Four Years Multidisciplinary UG Degree Programme	**96**	**6**
Basic Bachelor Degree at the Successful Completion of the Third Year (Six Semesters) of Four Years Multidisciplinary Undergraduate Degree Programme	**140**	**7**
Bachelor Degree with Honours in a **Discipline** at the Successful Completion of the Four Years (Eight Semesters) Multidisciplinary Undergraduate Degree Programme	**180**	**8**

Credit Requirements: The candidates shall complete courses equivalent to a minimum of

- 140 credits to become eligible for the Regular Bachelor Degree,
- 180 credits to become eligible for the Bachelor Degree with Honours
- 220 credits to become eligible for the Integrated Master's Degree.
- Master's Degree Programmes will be of One Academic Year (Two Semesters) for the Four Years Honours Degree holders
- Master's Degree Programmes will be of Two Academic Years (Four Semesters) for the three years basic or three years Honours Degree holders.
- Two Years Master's Degree Programmes will have exit option at the end of One Academic
- Year (Two Semesters) with the Post-graduate Diplomas in the respective disciplines/ subjects, provided they earn a minimum of 44 credits as follows:
    - 44 Credits after the Bachelor Degree to become eligible for the PG Diploma
    - 88 Credits after the Bachelor Degree to become eligible for the Master's Degree.

ACADEMIC BANK OF CREDITS (ABC)

- The Academic Bank of Credits (ABC), a national-level facility will promote the flexibility of the curriculum framework and interdisciplinary/multidisciplinary academic mobility of students across the Higher Education Institutions (HEIs) in the country with appropriate "credit transfer" mechanism.
- It is a mechanism to facilitate the students to choose their own learning path to attain a Degree/ Diploma/Certificate, working on the principle of multiple entry and exit as well as anytime, anywhere, and any level of learning.
- ABC will provide significant autonomy to the students by providing an extensive choice of courses for a programme of study, flexibility in curriculum, novel and engaging course options across a number of higher education disciplines/ institutions

CLASS ROOM STRENGTH OF STUDENTS There shall be Maximum of 70 students in each section.

ATTENDANCE:

- For the purpose of calculating attendance, each semester shall be taken as a Unit.
- Student shall be considered to have satisfied the requirement of attendance for the semester, if he/she has attended not less than 75% in aggregate of the number of working periods in each of the subjects compulsorily.
- A student who fails to complete the course in the manner stated above shall not be permitted to take the semester end examination.
- Suppose a candidate represents their institution / University/ Karnataka State/ Nation in Sports / NCC / NSS / Cultural or any officially sponsored activities, in that case, they may be permitted to claim attendance for the actual number of days participated, based on the Head of the Institution's recommendation

COURSE MATRIX See Annexure – 1

TEACHING AND EVALUATION:

M.Com/MBA/MFA/MBS graduates with B. Com, B.B.M, BBA & BBS as basic degree from a recognized university are only eligible to teach and to evaluate the subjects (excepting languages, compulsory additional subjects and core Information Technology related subjects) mentioned in this regulation. Languages and additional subjects shall be taught by the graduates as recognized by the respective board of studies.

PEDAGOGY

Effective learning requires an appropriate curriculum, an apt pedagogy, continuous formative assessment and adequate student support. The intention is to contextualise curriculum through meaningful pedagogical practices, which determine learning experiences directly influencing

learning outcomes. Active, cooperative, collaborative and experiential learning pedagogies are some of the examples.

The use of technology in creating a learning environment that connects learners with content, peers and instructors all through the learning process, respecting learners' pace is the need of the hour.

- Classroom processes must encourage rigorous thinking, reading and writing, debate, discussion, peer learning and self-learning.
- The emphasis is on critical thinking and challenge to current subject orthodoxy and develops innovative solutions. Curricular content must be presented in ways that invite questions, not as a body of ready knowledge to be assimilated or reproduced. Faculty should be facilitators of questioning and not authorities on expertise.
- Classroom pedagogy should focus on the 'how' of things, i.e. applying theory and ideas. All courses, including social sciences and humanities, should design projects and practicums to enable students to get relevant hands-on experiences.
- Learning must be situated in the Indian context to ensure no sense of alienation from their context, country and culture.
- Classroom processes must address issues of inclusion and diversity since students are likely to be from diverse cultural, linguistic, socio-economic and intellectual backgrounds. f)
- Cooperative and peer-supported activities must be part of empowering students to take charge of their own learning.
- Faculty will have the freedom to identify and use the pedagogical approach best suited to a particular course and student.
- Pedagogies like PBL (Problem / Project Based Learning) and Service Learning be brought into practice as part of the curriculum. Experiential learning in an internship with a specified number of credits is to be made mandatory.
- The blended learning (BL) method is intended to aid learners in developing 21st-century abilities as well as effective learning and skill development in subject-domains. BL should be introduced with caution and should not be used to replace classroom time as a privilege.

BLENDED MODE (BL) AS A NEW MODE OF TEACHING-LEARNING

UGC suggests implementing Blended Mode (BL) as a new mode of teaching-learning in higher education. BL is not a mere mix of online and face-to-face mode, but it refers to a well-planned combination of meaningful activities in both modes. The blend demands consideration of several factors, mainly focusing on learning outcomes and the learner centered instructional environment. An effective teaching learning process in a blended environment calls for understanding and skills of using appropriate pedagogies with suitable technologies. The UGC Concept Note provides guidelines for the implementation of BL.

Pedagogies for Online and Face-to-face Modes

Learner-centred teaching-learning activities include several cognitive processes which enable learners to be communicative, confident, creative and cooperative. Learners in BL environments are not visualised as passive learners but active learners generating ideas, assimilating knowledge individually and in teams. Once learning resources are provided on an online platform, students sitting in the classroom need not listen to the instructor again. The time, then, can be used for engaging them in activities. Even their online time can be used innovatively for making online sessions more effective and exciting. There are a few learning processes for both online and face-to-face modes.

Higher education learners are adult learners who come with their own world of experience, previous knowledge gained at schooling level and previous years of education, exposure to other sources of knowledge, etc. Even pre-session resources suggested by teachers help them with some knowledge, information. Lecturing of teachers assuming the learners are empty boxes is no more a preferred pedagogy. Instead, learners can contribute by sharing their knowledge, ideas, and views, either in the classroom or on online platforms.

BL mode will provide this opportunity to learners to a great extent. Resources can be uploaded, and external links can be posted on Learning Management systems before classroom sessions. These Out-of-class resources are helpful, at least for acquiring information. Once the student's study through the resources, classroom time can be utilised fruitfully in discussions. Online platforms such as discussion forums, shared documents, blogs, etc., may be used to help them share their ideas and knowledge on a common platform.

Brainstorming exercise always helps learners think spontaneously; derive solutions, ideas; appreciate others' ideas, and enjoy the generation of several ideas by the whole group instead of listening to only teachers' ideas and views. It creates a sense of personal responsibility to think and learn.

In addition to Brainstorming, Concept-mapping/Mind-mapping, Creative Presentations, Exposure to the real world, Case studies, Open Book Examinations, Online quiz, E-portfolio, Group examinations for conventional theory papers, Cooperative Learning Strategies are a few learning processes for online and face-to-face mode.

Hence the area of assessment and evaluation needs to be explored again in the light of BL mode.

SUGGESTIVE GUIDELINES FOR ASSESSMENT CONTINUOUS INTERNAL EVALUATION [CIE] & SEMESTER END EXAMINATION [SEE].

Assessment is an integral part of the teaching-learning process. A multidisciplinary program requires a multidimensional assessment to measure the effectiveness of the diverse courses. The assessment process acts as an indicator to both faculty and students to improve continuously.

The following are the guidelines for effective assessment of the program:

a. Student assessment should be as comprehensive as possible and provide meaningful and constructive feedback about the teaching-learning process to faculty and students.
b. Assessment tasks need to evaluate the capacity to analyse and synthesize new information and concepts rather than simply recall information previously presented.
c. The assessment process should be carried on in a manner that encourages better student participation and rigorous study.
d. Assessment should be a combination of continuous formative evaluation and an end-point summative evaluation. e)
e. A range of tools and processes for assessment should be used (e.g., open book tests, portfolios, case study/assignments, seminars/presentations, field work, projects, dissertations, peer and self-assessment) in addition to the standard paper-pencil test. The concerned teachers shall conduct tests/seminars/case studies by prior intimation to the students on evaluation modalities. The evaluated courses/assignments shall be immediately provided to the students.
f. Paper-pencil tests should be designed rigorously using various tools and processes (e.g., constructed response, open-ended items, multiple-choice, and more than one correct answer).
g. Continuous/ Internal assessment marks shall be shown separately. A candidate who has failed or wants to improve the result shall retain the IA marks, provided they fulfil the minimum requirements

The CIE and SEE will carry 40% and 60% weightage each, to enable the course to be evaluated for a total of 100 marks, irrespective of its credits. The evaluation system of the course is comprehensive & continuous during the entire period of the Semester.

- Total Marks for each course = 100%
- Continuous assessment (C1) = 20% marks
- Continuous assessment (C2) = 20% marks
- Semester End Examination (C3) = 60% marks.

The evaluation process of CIE (IA) marks shall be as follows:

1. The first component (C1) of assessment is for 20% marks. This shall be based on the test, assignment, seminar, case study, field work, project work etc. This assessment and score process should be completed after completing 50% of the syllabus of the course/s and within 45 working days of the semester programme.
2. The second component (C2) of assessment is for 20% marks. This shall be based on test, assignment, seminar, case study, field work, internship / industrial practicum / project work etc. This assessment and score process should be based on completion of the remaining 50% of the syllabus in the courses of any semester.

3. During the 17th – 19th week of the semester, a semester end examination shall be conducted by the college for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60%.
4. In case of a student who has failed to attend the C1 or C2 on a scheduled date, it shall be deemed that the student has dropped the test. However, in case of a student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the Program Coordinator / Principal. The Program Coordinator / Principal in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher but before commencement of the concerned semester end examinations.
5. For assignments, tests, case study analysis etc., of C1 and C2, the students should bring their own answer scripts (A4 size), graph sheets etc., required for such tests/assignments and these be stamped by the concerned department using their department seal at the time of conducting tests/ assignment / work etc.
6. The outline for continuous assessment activities for Component-I (C1) and Component-II (C2) of a course shall be as under.

Outline for continuous assessment activities for C1 and C2

Activities	**C1**	**C2**	**Total Marks**
Session Test	10% marks	10% marks	20%
Seminars/Presentations/Activity	10% marks		10%
Case study/Assignment/ Fieldwork / Project work etc.		10% marks	10%
Total	20% marks	20% marks	40%

7. For practical course of full credits, Seminar shall not be compulsory. In its place, marks shall be awarded for Practical Record Maintenance (the ratio is 50% : 50%)
8. Conduct of Seminar, Case study / Assignment, etc. can be either in C1 or in C2 component at the convenience of the concerned teacher.
9. The teachers concerned shall conduct test / seminar / case study, etc. The students should be informed about the modalities well in advance. The evaluated courses / assignments during component I (C1) and component II (C2) of assessment are immediately provided to the candidates after obtaining acknowledgement in the register by the concerned teachers(s) and maintained by the Chairman in the case of a University Post-Graduate Department and the Principal / Director in the case of affiliated institutions. Before commencement of the semester end examination, the evaluated test, assignment etc. of C1 and C2 shall be obtained back to maintain them till the announcement of the results of the examination of the concerned semester.

10. The internal assessment marks shall be published on the notice board of the department/college for information of the students.
11. The Internal assessment marks shall be communicated to the Registrar (Evaluation) at least ten days before the commencement of the University examinations, and the Registrar (E) shall have access to the records of such periodical assessments.
12. There shall be no minimum in respect of internal assessment marks.
13. Internal assessment marks may be recorded separately. A candidate who has failed or rejected the result shall retain the internal assessment marks.

SUGGESTIVE PATTERN OF QUESTION PAPER FOR INTERNAL ASSESSMENT TEST:

SECTION-A 1,2,3	(Remembering the concepts) Answer any TWO	(02 X 05 = 10 Marks)
SECTION -B: 4,5,6	(Understanding and applying) Answer any TWO	(02 X 04 = 08 Marks)
SECTION-C: 7,8	(Analyzing and evaluating) Answer any ONE	(01 X 12 = 12 Marks)
TOTAL		**30 Marks**

The evaluation process of SEE marks shall be as follows:

A candidate shall register for all the courses/papers of a semester for which they fulfil the requirements when they appear for the examination of that semester for the first time. (a)

1. There shall be Theory and Practical examinations at the end of each semester, ordinarily during November-December for odd semesters and during May-June for even semesters, as prescribed in the Scheme of Examinations.
2. Unless otherwise stated in the schemes of examination, practical examinations shall be conducted at the end of each semester. They shall be conducted by two examiners, one internal and one external and shall never be conducted by both internal examiners. The statement of marks sheet and the answer books of practical examinations shall be sent to 30 the Registrar (Evaluation) by the Chief Superintendent of the respective Colleges immediately after the practical examinations.
3. The candidate shall submit the record book for practical examination duly certified by the course teacher and the H.O.D/staff in-charge. It shall be evaluated at the end of the Semester at the practical examination.

SUGGESTIVE PATTERN OF QUESTION PAPER FOR SEE:

SECTION-A 1. a,b,c,d,e,f,g	(Conceptual questions) Answer any SIX	(06 X 02 = 12 Marks)
SECTION -B: 2,3,4,5.6	(Analytical questions) Answer any THREE	(03 X 04 = 12 Marks)
SECTION-C: 7,8,9,10,11	(Essay type questions) Answer any THREE	(03 X 12 = 36 Marks)
TOTAL		**60 Marks**

PROJECT REPORT AND VIVA-VOCE:

a) The Project report in the eighth semester carries 100 marks (60 marks for project report and 40 marks for viva – voce) which shall form part of Eighth semester examination.

b) There shall be single valuation of project report and this will be done simultaneously along with Viva - Voce. Internal Assessment does not carry any marks.

c) A batch of Two (02) Project Report and Viva – Voce Examiners shall evaluate and conduct Viva - Voce examinations for a maximum of Forty (40) Project Reports and Conduct Viva – Voce Examinations for the same candidates.

d) The principal of the college shall submit the project reports of the students, to the university within three days after the completion of Viva - Voce examination.

e) Candidate shall obtain a minimum of 40% marks (Including Viva-Voce) in this subject (project Report) failing which he she shall revise and resubmit before the commencement of the next examination. However, no student shall be allowed to resubmit the project report after three consecutive chances.

g) The board of examiners or their nominees" shall conduct viva-voce examination for Project Report.

MINIMUM FOR A PASS

a. No candidate shall be declared to have passed the Semester Examination as the case may be under each course/paper unless he/she obtains not less than 35% marks in written examination / practical examination and 40% marks in the aggregate of written / practical examination and internal assessment put together in each of the courses and 40% marks (including IA) in Project work and viva wherever prescribed.

b. A candidate shall be declared to have passed the program if he/she secures at least 40% of marks or a CGPA of 4.0 (Course Alpha-Sign Grade P) in the aggregate of both internal assessment and semester end examination marks put together in each unit such as theory papers / practical / field

work / internship / project work / dissertation / viva-voce, provided the candidate has secured at least 40% of marks in the semester end examinations in each unit.

c. The candidates who pass all the semester examinations in the first attempts are eligible for ranks provided they secure at least CGPA of 6.00 (Alpha-Sign Grade B+).

d. A candidate who passes the semester examinations in parts is eligible for only Class, CGPA and Alpha Sign Grade but not for ranking.

e. The results of the candidates who have passed the last semester examination but not passed the lower semester examinations shall be declared as NCL (Not Completed the Lower Semester Examinations). Such candidates shall be eligible for the degree only after completion of all the lower semester examinations.

f. If a candidate fails in a subject, either in theory or in practical's, he/she shall appear for that subject only at any subsequent regular examination, as prescribed for completing the programme. He/she must obtain the minimum marks for a pass in that subject (theory and practical's, separately) as stated above.

CARRY OVER

Candidates who fail in lower semester examinations may go to the higher semesters and take the lower semester examinations. However, no candidate shall be permitted to take the

A) Fifth semester examination unless he/she passes all courses/papers of the first semester examination and

B) No candidate shall be permitted to take the sixth semester examination unless he/she passes all courses/papers of the first and second semester examinations. Similarly, no candidate shall be permitted to take the

C) Seventh semester examination unless he/she passes all papers of the first three semester examinations, and

D) No candidate shall be permitted to take the 8th semester examination unless he/she passes all papers of the first four semesters' examinations)

CLASSIFICATION OF SUCCESSFUL CANDIDATES:

- An alpha-sign grade, the eight-point grading system, as described below may be adopted. The declaration of result is based on the Semester Grade Point Average (SGPA) earned towards the end of each semester or the Cumulative Grade Point Average (CGPA) earned towards the completion of all the eight semesters of the programme and the corresponding overall alpha-sign grades.
- If some candidates exit at the completion of first, second or third year of the four years Undergraduate Programmes, with Certificate, Diploma or the Basic Degree, respectively, then the results of successful candidates at the end of second, fourth or sixth semesters shall also

be classified on the basis of the Cumulative Grade Point Average (CGPA) obtained in the two, four, six or eight semesters.

TABLE - FINAL RESULT / GRADES DESCRIPTION

Semester GPA/ Program CGPA	Alpha-Sign / Letter Grade	Semester/Program % of Marks	Result / Class Description
9.00-10.00	**O (Outstanding)**	90.0-100	Outstanding
8.00-<9.00	**A+ (Excellent)**	80.0-<90.0	First Class Exemplary
7.00-<8.00	**A (Very Good)**	70.0-<80.0	First Class Distinction
6.00-<7.00	**B+** (Good)	60.0-<70.0	First Class
5.50-<6.00	**B (AboveAverage)**	55.0-<60.0	High Second Class
5.00-<5.50	**C (Average)**	50.0-<55.0	Second Class
4.00-<5.00	**P (Pass)**	40.0-<50.0	**Pass Class**
Below 4.00	**F (Fail)**	Below 40	Fail/Reappear
Ab (Absent)	-	Absent	-

The Semester Grade Point Average (SGPA) in a Semester and the CGPA at the end of each year may be calculated as described in ANNEXURE-2

REJECTION OF RESULTS:

a. A candidate may be permitted to reject result of the whole examination of any semester. Rejection of result course/paper wise or subject wise shall not be permitted.

b. The candidate who has rejected the result shall appear for the immediately following examination.

c. The rejection shall be exercised only once in each semester and the rejection once exercised shall not be revoked.

d. Application for rejection of results along with the payment of the prescribed fee shall be submitted to the Registrar (Evaluation) through the College of study together with the original statement of marks within 30 days from the date of publication of the result.

e. A candidate who rejects the result is eligible for only SGPA/CGPA or Class and not for ranking

TRANSFER OF ADMISSION

- Transfer of admissions are permissible only for odd semesters for students of other universities and within the University.
- His/her transfer admission shall be within the intake permitted to the college.
- He/she shall fulfil the attendance requirements as per the University Regulation.
- He/she shall complete the programme as per the regulation governing the maximum duration of completing the programme.
- A Candidate migrating from any other University may be permitted to join odd semester of the degree programme provided he/she has passed all the subjects of previous semesters /

years as the case may be. Such candidates must satisfy all other conditions of eligibility stipulated in the regulations of the University

- The candidate who is migrating from other Universities is eligible for overall SGPA/CGPA or Class and not for ranking. He/she shall complete the programme as per the regulation governing the maximum duration of completing the programme as per this regulation.

SUBJECTS OF STUDY

The Components of Curriculum for Four Years Multidisciplinary Undergraduate Programme: The Category of Courses and their Descriptions are given in the following Table;

1	Languages	Languages provide the medium of fresh and free thinking, expression and clarity in thought and speech. It forms as a foundation for learning other courses. Helps fluent communication. In addition to English, a candidate shall opt for any of the languages studied at the PU or equivalent level.
2	Foundation Courses/ Ability Enhancement Courses **(AECC)**	Foundation Courses enable students to develop a deeper sense of commitment to oneself and to the society and nation largely. These courses will supplement in better understanding of how to integrate knowledge to application into a society. Ability enhancement courses are the generic skill courses which are basic and needed to all to pursue any career. These courses ensure progression across all careers.
3	Skill Development Courses/ Vocational Courses **(SDC/VOC)**	Skill Enhancement/Development courses are to promote skills pertaining to a particular field of study. The purpose of these courses is to provide students life-skills in hands-on mode so as to increase their employability/ Self-employment. The objective is to integrate discipline related skills in a holistic manner with general education. These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based knowledge. Each University has complete freedom to suggest their own papers under this category based on their expertise, specialization, requirements, scope and need.
4	Discipline based Introductory Courses	Introductory courses bridge the gap for a student if he/she has not got a basic groundwork in a specific area of discipline.

5	Major Discipline Core Courses **(MDCC)**	A Major discipline is the field in which a student focuses during the course of his/her degree. A course in a discipline, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course. The core courses aim to cover the basics that a student is expected to imbibe in that particular discipline. They provide fundamental knowledge and expertise to produce competent, creative graduates with a strong scientific, technical and academic acumen. The courses under this category are to be taught uniformly across all universities with minimum deviation. The purpose of fixing core courses is to ensure that all the institutions follow a minimum common curriculum so that each institution adheres to a common minimum standard Which makes credit transfer and mobility of students easier.
6	Major Discipline Elective Courses **(MDEC)**	Elective Course is a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/subject of study or which provides an extended scope or enables an exposure to some other discipline/ subject/domain or which nurtures the candidate's proficiency/skill. Elective courses offered under the main discipline are referred to as Discipline Specific Electives. These courses provide more depth within the discipline itself or within a component of the discipline and provide advanced knowledge and expertise in an area of the discipline. The institutions have freedom to have their own courses based on their expertise, specialization, requirements, scope and need. The elective courses may be of interdisciplinary nature
7	Minor Discipline Courses **(MDC)**	A Minor Discipline is a secondary specialization that one may choose to pursue in addition to a Major Discipline. They may be related areas of studies or two distinct areas of studies which are not interrelated at well.
8	Generic Elective Courses **(GEC)**	Generic Elective Courses are courses chosen from an unrelated discipline/ subject, with an intention to seek exposure beyond discipline/s of choice. The purpose of these is to offer the students the option to explore disciplines of interest beyond the choices they make in Core and Discipline Specific Elective Courses.

		Note: A core course offered in a discipline/subject may be treated as an elective by other discipline/subject and vice versa and such electives may also be referred to as Generic Electives.
9	Project work/ Dissertation/ Internship/ Entrepreneurship	Project work is considered as a special course involving application of knowledge in solving / analyzing / exploring a real life situation / difficult problem/ data analysis. Project Work has the intention to provide research competencies at Undergraduate level. It enables to acquire special/ advanced knowledge through supplement / support study to a project work. Candidates shall carry out project work on his/her own with an advisory support by a faculty member to produce a dissertation/ project report. Internship/ Entrepreneurship shall be an integral part of the Curriculum.
10	Extra-Curricular Activities / Co-curricular and Extension Activities (ECA)	These activities help in character building, spiritual growth, physical growth, etc. They facilitate development of various domains of mind and personality such as intellectual, emotional, social, moral and aesthetic developments. Creativity, Enthusiasm, and Positive thinking are some of the facets of personality development and the outcomes of these activities.

CORE PAPER

Business administration subjects, ability and skill enhancement and other courses in accordance with the course pattern &the scheme of examinations.

ABILITY ENHANCEMENT COURSES:

Ability Enhancement (AE) Courses can be divided into two categories:

a) AE Compulsory Courses (AECC): The universities may have common curriculum for these papers.

There may be one paper each at least in the first four semesters viz.

- Environmental Studies
- Constitution of India.
- Business communication.
- Life skills.
- Foreign language.
- Managerial skills.

In addition to these, two languages shall be studied in the first four semesters of the Undergraduate Programmes.

b) Skill Enhancement Courses (SEC): There are skill enhancement/development courses in the first six semesters, one in each semester as prescribed by the concerned faculty and approved by the Academic Council. The courses may include the following:

- Digital Fluency.
- Creativity & Innovation.
- Internship in Audit firms
- Artificial Intelligence.
- Health Wellness/ Social & Emotional Learning
- Industry Analysis and Reports
- E-Commerce
- Collective Bargaining & Negotiation Skills in Business
- Training & Development
- Stock Market Operations
- Communication & Documentation
- New Venture Planning and Development
- Personal Tax Planning and Tax Management
- Cyber Security
- Leadership & Team Development
- Event Management
- Basics of Spreadsheets modelling
- Advanced Spreadsheets modelling
- Advertisement & Personal Selling
- Managing Digital Platforms
- ERP Applications
- Others (if any)

c) **Generic/Open Elective Courses:**

- Personal Financial Planning
- Accounting for Everyone
- Financial Literacy
- Financial Environment
- Public Policy
- People Management
- Rural Development
- Basics of Management
- Investment in Stock Markets

- Good Governance
- Sustainable Development Goals
- Risk Management
- Digital Marketing
- Creativity and Innovation
- Public Administration and Business
- Others (if any)

d) Pre-requisite/ Bridge course/Foundation course:

- Basics of Accounting.
- Introduction to Math's.
- Introduction to forms of organization.
- Introduction of financial markets.
- Banking

e) Vocational course:

- Foreign language.
- Secretarial practice.
- I T for managers.
- Tally ERP.
- Digital marketing.
- Application of statistical software.
- GST.
- Tax procedure & practice.
- Social Media Marketing.
- Jewelry designing.
- Fashion designing.

f) Co-Curricular and Extension Activities

A student shall opt for two of the following activities offered in the college, in each of the first six semesters of the undergraduate programmes. The activity carries a credit each for each of the activities and will be internally assessed for 50 marks.

- Physical Education or Activities related to Yoga/ Sports and Games
- N.S.S. / N.C.C / Rotaract club/ Lions Club/Red cross
- Field studies / Industry Implant Training
- Involvement in campus publication or other publications
- Publication of articles in newspapers, magazines

- Community work such as promotion of values of National Integration, Environment, Human rights and duties, Peace, Civic sense etc.
- A Small project work concerning the achievements of India in different fields
- Involvement in popularization programmes such as scientific temper
- Innovative compositions and creations in music, performing and visual arts etc.
- Any other activities such as Cultural Activities as prescribed by the University

ANNEXURE -1

Semester I								
Sl. No.	**Course Code**	**Title of the Course**	**Category of Courses**	**Teaching Hours per Week (L + T + P)**	**SEE**	**CIE**	**Total Marks**	**Credits**
1	Lang.1.1	Language - I	AECC	3+1+0	60	40	100	3
2	Lang.1.2	Language – II	AECC	3+1+0	60	40	100	3
3	BBA.1.1	Management Innovations	DSC	4+0+0	60	40	100	4
4	BBA.1.2	Fundamentals of Accountancy	DSC	3+0+2	60	40	100	4
5	BBA.1.3	Marketing Management	DSC	4+0+0	60	40	100	4
6	BBA.1.4	Digital Fluency	SEC-SB	1+0+2	50	50	100	2
7	BBA.1.5	Tourism & Travel Management /Event Management	OEC	3+0+0	50	50	100	3
8		Physical Education - Yoga	SEC-VB	0+0+2				1
9		Health and Wellness	SEC-VB	0+0+2				1
Sub –Total (A)					**400**	**300**	**700**	**25**

Semester II								
Sl. No.	Course Code	Title of the Course	Category of Courses	Teaching Hours per Week (L + T + P)	SEE	CIE	Total Marks	Credits
1	Lang.2.1	Language - I	AECC	3+1+0	60	40	100	3
2	Lang.2.2	Language - II	AECC	3+1+0	60	40	100	3
3	BBA.2.1	Financial Accounting and Reporting	DSC	3+0+2	60	40	100	4
4	BBA.2.2	Human Capital Management	DSC	4+0+0	60	40	100	4
5	BBA.2.3	Business Environment	DSC	4+0+0/ 3+0+2	60	40	100	4
6	BBA.2.4	Leadership & Team Development	SEC-VB	1+0+2	-	100	100	2
7	BBA.2.5	Environmental Studies	AECC	2+0+0	50	50	100	2
8	BBA.2.6	Health & Personal Insurance/ NGO Management	OEC	3+0+0	50	50	100	3
Sub –Total (B)					400	400	800	25

EXIT OPTION WITH CERTIFICATION-WITH ABILITY TO SOLVE WELL DEFINED PROBLEMS

ACRONYMS EXPANDED

- AECC : Ability Enhancement Compulsory Course
- DSC © : Discipline Specific Core (Course)
- SEC-SB/VB : Skill Enhancement Course-Skill Based/Value Based
- OEC : Open Elective Course
- DSE : Discipline Specific Elective
- SEE : Semester End Examination
- CIE : Continuous Internal Evaluation
- L+T+P : Lecture + Tutorial + Practical(s)

Notes:

- Practical Classes may be conducted in the Business Lab or in Computer Lab or in Class room depending on the requirement. One batch of students should not exceed half (i.e., 30 or less than 30 students) of the number of students in each class/section.
- 2 Hours of Practical Class is equal to 1 Hour of Teaching.
- Whenever it is conducted for the entire class (i.e., more than 30 students) 2 Hours of Practical Class is equal to 2 Hours of Teaching.

Name of the Programme: Bachelor of Business Administration (BBA)

Course Code: BBA 1.1

Name of the Course: Management Innovation

Course Credits	No. of Hours per week	Total No. of Teaching Hours
4 Credits	4 Hrs	56 Hrs

Pedagogy: Classroom lecture, tutorials, Group discussion, Seminar, Case studies, fieldwork etc.,

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

- Enhance their knowledge and skills which are essential for success in management careers.
- Understand the concepts related to Business Management.
- Adapt to the changing opportunities.
- Understand management information systems in practice
- Understand the role of Artificial Intelligence in Business Decisions.

Syllabus

Module No. 1: MANAGERIAL FUNCTIONS (12 Hrs)

Concept of Management, Principles of Management-Managerial Functions-Planning, Organizing, Staffing, Directing, Coordinating, Controlling. Manager- Meaning of Manager, Types of Managers, Role of Manager, Managerial Skills. Modern Organization Structure. Ethics in Management. CSR (Corporate Social Responsibility)- Meaning, Definition, Types, Need and responsibility towards stakeholders and community

Module No. 2: CHANGE MANAGEMENT (12 Hrs)

Meaning, Need, Volatility, Uncertainty, Complexity, Ambiguity (VUCA), 7 R's of Change Management - Reuse, Repurpose, Rot, Repair, Return, Refill and Refuse, Steps in Change Management, Change Management Risk. Change Management Process - Meaning, Need, Stages, Change Management Models, Theories of Change Management, Resistance to Change.

Module No. 3: MANAGEMENT INFORMATION SYSTEM (10 Hrs)

Meaning, Definition, concepts, Types of Information Systems, Trends in Information Technology, Role of MIS, MIS report- Meaning, Need, Type and Format of MIS report. Managing Data Resources, ERP- Meaning, Need, Steps, Challenges of ERP.

Module No. 4: GOVERNMENT and BUSINESS (12 Hrs)

Role of Government in Business Organization, State participation in Business Organization, Relationship between Government & Business Organization. Role of Chamber of Commerce and Industry, Government Schemes for Business Organization, Government Policy on Regional Balances

Module No. 5: BUSINESS INTELLIGENCE (BI) (10 Hrs)

Meaning and Definition of BI, Need, Role of BI, pros and cons of BI, types, Career Opportunities in BI, Trends in Business Intelligence.

Artificial Intelligence- Meaning, Goals, Role of AI in Management.

Skill Developments Activities:

- Two cases on the above syllabus should be analyzed by the teacher in the classroom and thesame need to be recorded by the student in the Skill Development Book.
- List out recent changes in management structure.
- Draft chart on functions of Management
- Prepare a report on the application of Artificial intelligence in Business.
- Any other activities, which are relevant to the course

Reference Books:

- Stephen P. Robbins, Management, Pearson
- Koontz and O‟ Donnell, Management, McGraw Hill.
- Appanniah and Reddy, Management,HPH.
- Management information system: Pearson
- Change Management: Prof Dr. Olaf Passenheim

Note: Latest edition of textbooks and reference Books may be used

Course Code: BBA 1.2

Name of the Course: Fundamentals of Accountancy

Course Credits	No. of Hours per week	Total No. of Teaching Hours
4 Credits	4 Hrs	56 Hrs

Pedagogy: Classroom lecture, tutorials, Group discussion, Seminar, Case studies, fieldwork etc.,

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

- Understand the basic Concepts of Accounting.
- Pass Journal Entries and Prepare Ledger Accounts.
- Prepare Subsidiary Books.
- Prepare Trial Balance and Final Accounts of Proprietary concern.
- Use Accounting Concepts in Spreadsheet.

Syllabus

Module No. 1: INTRODUCTION TO ACCOUNTANCY (10 Hrs)

Introduction – Meaning and Definition – Objectives of Accounting – Functions of Accounting– Users of Accounting Information – Limitations of Accounting – Accounting Cycle - Accounting Principles – Accounting Concepts and Accounting Conventions. Accounting Standards-objectives-significance of accounting standards. List of Indian Accounting Standards.

Module No. 2: ACCOUNTING PROCESS (12 Hrs)

Process of Accounting - Double entry system – Kinds of Accounts – Rules-Transaction Analysis – Journal – Ledger – Balancing of Accounts – Trial Balance – Problems on Journal, Ledger Posting and Preparation of Trial Balance

Module No. 3: SUBSIDIARY BOOKS (14 Hrs)

Meaning – Significance – Types of Subsidiary Books –Purchases Book, Sales Book (With Tax Rate) , Purchase Returns Book, Sales Return Book, Bills Receivable Book, Bills Payable Book. Types of Cash Book- Simple Cash Book , Double Column Cash Book , Three Column Cash Book and Petty Cash Book(Problems only on Three Column Cash Book and Petty Cash Book).

Module No. 4: FINAL ACCOUNTS OF PROPRIETARY CONCERN (14 Hrs)

Preparation of Statement of Profit and Loss and Balance Sheet of a proprietary concern with special adjustments like Depreciation, Outstanding and Prepaid Expenses, Outstanding And Received In Advance

of Incomes, Provision for Doubtful Debts, Drawings and Interest On Capital.

Module No. 5: EXPERIENTIAL LEARNING (06 Hrs)

Creation of Subsidiary Books in Spreadsheet: Purchases Book, Sales Book (With Tax Rate), Purchase Returns Book, Sales Return Book, Bills Receivable Book, Bills Payable Book. Types of Cash Book- Simple Cash Book, Double Column Cash Book, Three Column Cash Book and Petty Cash Book. Preparation of Statement of P/L, Balance Sheet in Spreadsheet.

Skill Developments Activities:

- List out the accounting concepts and conventions.
- Prepare a Bank Reconciliation Statement with imaginary figures

- Collect the financial statement of a proprietary concern and record it.
- Prepare a financial statement of an imaginary company using spreadsheet
- Any other activities, which are relevant to the course.

Reference Books:

- Hanif and Mukherjee, Financial Accounting, McGraw Hill Publishers
- Arulanandam & Raman; Advanced Accountancy, Himalaya Publishing House
- S.Anil Kumar,V.Rajesh Kumar and B.Mariyappa–Fundamentals of Accounting, Himalaya Publishing House.
- Dr. S.N. Maheswari, Financial Accounting, Vikas Publication
- S P Jain and K. L. Narang, Financial Accounting, Kalyani Publication
- Radhaswamy and R.L. Gupta, Advanced Accounting , Sultan Chand
- M.C. Shukla and Goyel, Advanced Accounting , S Chand.

Note: Latest edition of textbooks and reference Books may be used

Course Code: BBA 1.3

Name of the Course: Marketing Management

Course Credits	No. of Hours per week	Total No. of Teaching Hours
4 Credits	4 Hrs	56 Hrs

Pedagogy: Classroom lecture, tutorials, Group discussion, Seminar, Case studies, fieldwork etc.,

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

- Understand the Concepts and Functions of Marketing.
- Analyse Marketing Environment its Impact on the Business.
- Understand the Consumer Behaviour
- Describe Marketing Mix and also strategize Marketing Mix
- Describe Service Marketing Mix.
- Use the Technology in Market Survey and Collection of Data.
- Understand the Various Acts Related to Marketing.

Syllabus

Module No. 1: FUNDAMENTALS OF MARKETING (14 Hrs)

Introduction to Marketing, Evolution of Marketing, Meaning and Definitions, Objectives, Importance and Functions of Marketing, Traditional Marketing Concept vs Modern Marketing Concept. Marketing V/S Selling, Marketing Myopia, Approaches to Marketing.

Marketing of Services - Meaning, Definition, Features.

Marketing Environment - Meaning, Environmental Scanning, Benefits of Environmental Scanning, Components of Marketing Environment.

Module No. 2: MARKETING MIX & LEGAL ASPECTS OF MARKETING (14 Hrs)

Marketing Mix - Introduction, Elements of Marketing Mix, Product-Product Mix, Product Line, Product Lifecycle, New Product Development, Reasons For Failure of New Product, Branding, Packing and Packaging, Labeling, Pricing – Objectives, Factors Influencing Pricing Policy, Methods ofPricing; Physical Distribution–Meaning, Factors Affecting Channel Selection, Types of Marketing Channels. Promotion – Meaning and Significance of Promotion, Personal Selling and Advertising, Services Marketing Mix.

Legal Aspects of Marketing- Consumer Protection Act 1986, Environment Protection Act 1955, The Prevention of Food Adulteration Act 1951, The Competition Act 2002, The Packaging Rules 1977, FSSAI.

Module No. 3: CONSUMER BEHAVIOUR (08 Hrs)

Meaning, Definition: Consumer, Consumer Behaviour, Factors Influencing Consumer Behaviour, Consumer Decision Process, Types of Buying Motives, Theories of Consumer Buying Behaviour, Consumer Socialization, Factors Influencing Consumer Socialization

Module No. 4: MARKETING STRATEGIES (08 Hrs)

Market Segmentation- Meaning, Definition, Significance of Market Segmentation, Basis forSegmentation of Consumer Market and Business Segmentation.

Target Marketing: Steps in Target Marketing, Market Targeting Strategies.

Market Positioning: Importance of Marketing Positioning, Basis for Developing Positioning Strategy

Module No. 5: MARKET RESEARCH and INNOVATIONS (12 Hrs)

Market Research- Meaning Definition, Objectives, Characteristics. Types of Marketing Research, Methods in Market Research, Marketing Research Tools and Techniques – Consumer Engagement Softwares' & online data collection forms (Quest Back, Key Survey, Klout, Kred, Survey Monkey, Sparrow Survey, Typo Form Etc.)

Innovations In Marketing: Meaning, Definition, Characteristics and Challenges- Green Marketing, Online Marketing, Digital Marketing, Content Marketing, Social Media Marketing, Disruptive Marketing.

Skill Developments Activities:

- Two cases on the above syllabus should be analyzed and recorded in the skill developmentbook.
- Design a logo and tagline for a product of your choice
- Develop an advertisement copy for a product.
- Prepare a chart for distribution networks for different products.
- Prepare a Survey Report on Consumer Behaviour

Any other activities, which are relevant to the course.

Reference Books:

- Philip Kotler, Marketing Management, Prentice Hall.
- Lovelock Christopher, Services Marketing: People, Technology, Strategy, PHI
- Bose Biplab, Marketing Management, Himalaya Publishers.
- J.C. Gandhi, Marketing Management, Tata McGraw Hill.
- Ramesh and Jayanti Prasad: Marketing Management, I.K. International
- Sontakki, Marketing Management, Kalyani Publishers.
- P N Reddy and Appanniah, Marketing Management
- E – Commerce, P T Joseph, 4th Edition, 2013, PHI learning Pvt.Ltd.

Note: Latest edition of textbooks and reference Books may be used

Course Code: BBA 1.4 (SEC - SB)

Name of the Course: Digital Fluency

Course Credits	No. of Hours per week	Total No. of Teaching Hours
2 Credits	3 Hrs	15 hours of theory and 30 hours of practical's

Pedagogy: Classroom lecture, Flipped classroom learning, Practical etc.

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

- Learn how machines can be made to learn from data and carry out human tasks.
- Understand the importance of Big Data Analytics (BDA) in different fields.
- Learn how to perform data analysis in Excel using pivot tables and pivot charts.
- Understand the core concepts of Internet of Things (IoT), discover the skills that are required for IoT and understand how IoT system works.
- Understand the importance & service models of Cloud Computing in different fields.
- Understand the basic aspects of Cyber security & how it safeguards various sectors in the industry

Syllabus

Registration- Future Skills Course Registration Process

Module No. 1: Emerging Technologies (05 Theory hours and 10 practical hours)

Overview of Emerging Technologies:

i. Artificial Intelligence, Machine Learning, Deep Learning,

ii. Database Management for Data Science, Big Data Analytics,

iii. Internet of Things (IoT) and Industrial Internet of Things (IIoT)

iv. Cloud computing and its service models

v. Cyber Security and Types of cyber attack

Module No. 2: Applications of Emerging Technologies (05 Theory hours and 10 practical hours)

Applications of emerging technologies:

i. Artificial Intelligence

ii. Big Data Analytics

iii. Internet of Things

iv. Cloud Computing

v. Cyber Security

Module No. 3: Building Essential Skills Beyond Technology (05 Theory hours and 10 practical hours)

Importance of the following:

i. Effective Communication Skills

ii. Creative Problem Solving & Critical Thinking

iii. Collaboration and Teamwork Skills

iv. Innovation & Design Thinking

v. Use of tools in enhancing skills

References to learning resources:

1. The learning resources made available for the course titled “Digital 101” on Future Skills Prime Platform of NASSCOM

Course Code: BBA 1.4 (SEC-SB)

Name of the Course: Spreadsheet for Business

Course Credits	No. of Hours per week	Total No. of Teaching Hours
2 Credits	3 Hrs	28 Hrs

Pedagogy: Classroom lecture, tutorials, Group discussion, Seminar, Case studies, lab, fieldwork etc.,

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

- Understand the basic concepts of Spreadsheet
- Summarize data using Functions
- Apply Conditions using formulas and Functions
- Implement Basic financial Concepts in Spreadsheet

Syllabus

Module No. 1: Introduction (08 Hrs)

Introduction to spreadsheets - Office Suite overview - Basic text and cell formatting - Basic arithmetic calculation - Special paste - Freeze pane - Auto completion of series - Sort and filter - Charts.

Module No. 2: Summarize data using functions (10 Hrs)

Perform calculations by using the SUM function- Perform calculations by using MIN and MAX functions - Perform calculations by using the COUNT function - Perform calculations by using the AVERAGE function - Perform logical operations by using the IF function - Perform logical operationsby using the SUMIF function - Perform logical operations by using the AVERAGEIF function - Perform statistical operations by using the COUNTIF function.

Module No. 3: Text Functions (10 Hrs)

Data validation - Text Functions: LEN, TRIM, PROPER, UPPER, LOWER, CONCATENATE.

Skill Developments Activities:

- Enter class data into rows and columns
- Create Draft Marks Card in Spreadsheet
- Create Draft profit and Loss and Balance Sheet in Spreadsheet
- Create GST Invoice in Spreadsheet with Tax Rate

Any other activities, which are relevant to the course.

Reference Books:

- Learning MS-Word and MS-Excel, by Rohit Khurana
- Excel Formulas and Functions 2020: The Step by Step Excel Guide with Examples on How to Create Powerful Formulas: 1 by Adam Ramirez
- Excel 2013 in Simple Steps by Kogent Learning Solutions Inc.
- Excel Formulas and Functions: The Step by Step Excel Guide on how to Create Powerful Formulas by Harjit Suman

Note: Latest edition of textbook and reference Books may be used

Course Code: BBA 1.5 Open Elective Course (OEC)

Name of the Course: Tourism and Travel Management

Course Credits	No. of Hours per week	Total No. of Teaching Hours
3 Credits	3 Hrs	42 Hrs

Pedagogy: Classroom lecture, tutorials, Group discussion, Seminar, Case studies, fieldwork etc.,

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

- Understand the fundamental concept of Tourism.
- Overview of the Tourism products and resources of India.
- Understand the basic concept and various components of Tourism management.
- Understand the Functions and Types of Travel Agents and Tour Operators.
- Familiarize the concept of Transport and Accommodation.

Syllabus

Module No. 1: INTRODUCTION TO TOURISM (08 Hrs)

Travel: Meaning, Factors affecting travel, Traveler, Tourist, Travel guide (Meaning only).

Tourism: Meaning and Definition, Objectives, Types of Tourism: Inter-regional, Intra regional, Inbound and Outbound Tourism, Domestic, International. Forms of Tourism: Religious, Medical, Historical, Social, Adventure, Health, Business, Conference, Sports. Impact of Tourism

Module No. 2: TOURISM PRODUCTS (08 Hrs)

Tourism Resources- Meaning, Definition, Tourism resources of India-types & typologies

Cultural resources: Art & Architectures, Historical, Festivals, Costumes.

Popular Religious Centres: Hindu, Muslim, Christianity, Buddhism, Jainism, Sikhism others. Performing Art of India: Classical dance, folk, music, musical instruments, costumes, handicrafts, boat race, food festivals, An overview of tourism development strategies

Module No. 3: TOURISM MANAGEMENT & HOSPITALITY (10 Hrs)

Tourism Management: Meaning, Nature, Levels of Management, Principles of Management, Role of Manager, Managerial Functions (Planning, Decision, Organizing , Staffing, Directing) Accommodation - Meaning, role of accommodation in tourism, Types of Accommodations.

Module No. 4: TRAVEL AGENCY & TOUR OPERATIONS (10 Hrs)

Travel Agency: Introduction, Meaning, Types of Travel Agency, Functions, challenges faced by Travel Agency and Tour Operators. Procedure for approval of a travel agency & tour operators (IATA & Govtbody Approval) Travel Documentation: Passport-types, Procedure to apply, VISA-Types & Documents required for foreigners to visit India. Tour Operators: Meaning, Roles and Responsibilities, Types of tour operators, Types of tour packages.

Travel Organizations- UFTAA, TAAI, IATO and Its Functions.

Module No. 5: TRANSPORTATION MANAGEMENT (06 Hrs)

Transportation: Meaning, Role of transport in tourism, types of transportation systems, Rail transport- History, Role of Indian Railway in tourism, Air transport- History, Air Transport Regulations, Limitations, Recent trends in International Tourism. Water Transport- categories of water transport, Cruise Line type, facilities and Cruise Accommodation. Virtual Tour: Meaning, Characteristics, Pro's and Con's

Skill Developments Activities:

- Students are required to maintain a Newspaper clippings file, detailing the articles pertainingto tourism.
- Prepare a report on unexplored destinations in India and their potential for tourism promotion.
- Briefly Explain Role of Government – Ministry of tourism.
- Visit Virtual/ Study Tour and Prepare a report.
- Prepare an Itinerary of a tour.

Any other activities, which are relevant to the course.

Reference Books:

- Cottman, Travel & Tourism
- Bhatia AK (2002), Tourism Development: Principles and Practices, Revised edition Sterling Publishers Private Limited, New Delhi.
- Chris Cooper, Fletcher John, Fyall, Alan, Gilbert David, Wall Stephen (2008), Tourism Principles and Practices,4th edition, Pearson Education Limited.
- Dennis L & Foseter – Glencoe (2003), an Introduction to Travel & Tourism, McGrawHill International.
- Dr. Revathy Girish (2007), Indian Tourist Panorama, Dominant Publishers and Distributors,New Delhi.
- Ghosh Bishwanth (2000), Tourism & Travel Management, Second Revised Edition Vikas Publishing House Pvt Ltd, New Delhi.
- Kaul R.N 91991), Dynamics of Tourism, Sterling Publishers Pvt Ltd, Volume 1,2 & 3 New Delhi,

Note: Latest edition of textbooks and reference Books may be used

Course Code: BBA 1.5 Open Elective Course (OEC)

Name of the Course: Event Management

Course Credits	No. of Hours per week	Total No. of Teaching Hours
3 Credits	3 Hrs	42 Hrs

Pedagogy: Classroom lecture, tutorials, Group discussion, Seminar, Case studies, fieldwork etc.,

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

- Understand the process of organizing an event.
- Understand the importance of a checklist in organizing an event.
- Familiarize with organizing corporate events
- Obtain a sense of responsibility for the multidisciplinary nature of event management.
- Learn to promote the events.

Syllabus

Module No. 1: INTRODUCTION TO EVENT MANAGEMENT (08 Hrs)

Introduction to Event Management: Meaning , Scope, Types of Events (Corporate, Private, orCharity, Indoor Events, OutDoor Events , Celebrity Events) Tools For Event Planning & Management , MICE Events, Event Operations and Services (Setting Up, Parking , Maintenance, Ticketing , Food and Beverage, Logistics) .

Module No. 2: EVENT PLANNING (08 Hrs)

Event Planning: Event Checklist, Hosting , Principles of Holding Event , Reserving Event Hall, Preparing and Designing ,The Schedule of Event Permissions, Policies , Government & Local Authorities , Phonographic , Performance License , Five Bridges Of Event Management , Characteristics of Successful Event Management

Module No. 3: CORPORATE EVENT MANAGEMENT (10 Hrs)

Corporate Event Organization : Preparing A Blueprint , Facilities Planning and Organizing (Assigning Staff , Maintenance of Inventory For The Chemicals and Equipments , Cleaning, Maintenance, Aesthetic Upkeep , Maintaining Back Areas, Public Areas and Surroundings, Floral Designing (- Assigning The Responsibilities , Event Organizer Arrangements , Corporate Event Packages , Corporate Hospitality , Well-Being of the Patrons & Participants , Entailing The Entertainment In Corporate Events and Corporate Event Reporting .

Module No. 4: MARKETING OF EVENTS (10 Hrs)

Marketing for Events: Introduction , Importance , Public relation strategies , Brainstorming sessions , writing for public relation (Reviews). Tools of promotion: Media, Types of Media (Print , Electronic, Social Media Networks). Advertising, Promotional Aids (Invitation, Brochures, Leaflets)

Module No. 5: POST EVENT FUNCTIONS (06 Hrs)

Post event functions: Basic guidelines of Budgeting , Essence of margin, Break even Analysis,Cost-Benefit Analysis, Forecasting Techniques, SWOC Analysis.

Skill Developments Activities:

- Prepare an event report with imaginary activities.
- Prepare a checklist for a birthday party.
- Prepare a Budget for Organizing an Event.
- Write a public relation letter for medical event
- Prepare a break-even analysis with imaginary figures for an event.
  Any other activities, which are relevant to the course.
-

Reference Books:

- Mark Sonderm CSEP -Event entertainment and production:publishers; wiley and sons, Inc
- Annestephen; Event management, HPH.
- K. Venkatramana -Event Management - SHBP.
- K Ramachandra and Allabaksh Principles of Event Management HPH
- Rekha and Vibha Marketing management -VBH
- Nihaasif Event management-VBH

Note: Latest edition of textbooks and reference Books may be use.

ANNEXURE-2

COMPUTATION OF SEMESTER GRADE POINT AVERAGE AND CUMULATIVE (AGGREGATE) GRADE POINT AVERAGE

1. **Calculation of Semester Grade Point Average (SGPA)**

   The Grade Points (GP) in a course shall be assigned on the basis of marks scored in that course as per the Table I. Any fraction of mark in the borderline less than 0.50 be ignored in assigning GP and the fractions of 0.50 or more be rounded off to the next integers. The Credit Points (CP) shall then be calculated as the product of the grade points earned and the credits for the course. The total CP for a semester is the sum of CP of all the courses of the semester. The SGPA for a semester is computed by dividing the total CP of all the courses by the total credits of the semester. It is illustrated below with typical examples. 2.

2. **Calculation of Aggregate or Cumulative GPA (CGPA)**

   The aggregate or cumulative SGPA (CGPA) at the end of the second, fourth, sixth, eighth and tenth semesters shall be calculated as the weighted average of the semester grade point averages. The CGPA is calculated taking into account all the courses undergone over all the semesters of a programme, i.e. The CGPA is obtained by dividing the total of semester credit weightages by the maximum credits for the programme.

   $CGPA = \Sigma(Ci \times Gi) / \Sigma Ci$

   where Gi is the grade point of the ith course/ paper and Ci is the total number of credits for that course/ paper.

   $CGPA = \Sigma(Ci \times Si) / \Sigma Ci$

   where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester.

An illustration is given below:

Table 1: Conversion of Percentage of Marks into Grade Points in a Course/Paper

% Marks in a paper/practical	Grade Point (GP)	% Marks in a paper/practical	Grade Point (GP)
98-100	**10**	63-67	**6.5**
93-97	**9.5**	58-62	**6.0**
88-92	**9.0**	53-57	**5.5**
83-87	**8.5**	48-52	**5.0**
78-82	**8.0**	43-47	**4.5**
73-77	**7.5**	40-42	**4.0**
68-72	**7.0**	Below 40	**0**

An Illustration of Calculation of Semester Grade Point Average (GPA):
I Semester (Typical)

Courses/Papers	C1	C2	C3	C4	C5	C6	C7	C6	C7	C8	Total
Max. Marks	100	100	100	100	100	100	100	50	25	25	800
Marks Obtained	77	74	62	76	78	72	68	38	18	17	580
% Marks Obtained	77	74	62	76	78	72	68	76	72	68	-
Grade Points Earned (G)	7.5	7.5	6.0	7.5	8.0	7.0	7.0	7.5	7.0	7.0	-
Credits for the Course (C)	3	3	3	3	3	3	3	2	1	1	25
Credit Points, CP (G x C)	22.5	22.5	18.0	22.5	24.0	21.0	21.0	15.0	7.0	7.0	180.5

Semester Aggregate Marks : 580/ 800 = **72.5%**

Classification of Result **:First Class Distinction**

SGPA = Total CP / Total Credits = 180.5 / 25= **7.22**

Semester Alpha Sign Grade: A

3. Calculation of Cumulative Grade Point Average (CGPA)

The Cumulative Grade Point Average (CGPA) at the end of the second, fourth, sixth, eighth and tenth semesters shall be calculated as the weighted average of the semester grade point averages (SGPA) of two, four, six, eight and ten semesters, respectively. The CGPA is obtained by dividing the total of semester credit weightages by the maximum credits for the programme.

Calculation of Cumulative Grade Point Average (CGPA) for Certification:

Illustration-I

Semester	**I**	**II**	**Total**
Total Marks per Semester	800	800	1600
Total Marks Secured	580	641	1221
Semester Alpha Sign Grade	A	A+	-
Semester GPA	7.22	8.02	-
Semester Credits (C)	25	25	50
Semester Credit Points (CP) (SGPA x C)	180.5	200.5	381.0

Aggregate Percentage of Marks = 1221 / 1600 = 76.31%

Classification of Result: ***First Class Distinction***

Cumulative Grade Point Average (CGPA) = Total of Semester CP / Total Credits for the program = 381.0 /50= 7.62

Program Alpha Sign Grade: A

ii) Calculation of Cumulative Grade Point Average (CGPA) for the Diploma: Illustration-II

Semester	I	II	III	IV	Total
Total Marks per Semester	800	800	800	800	3200
Total Marks Secured	580	641	664	684	2569
Semester Alpha Sign Grade	A	A+	A+	A+	-
Semester GPA	7.22	8.02	8.30	8.55	-
Semester Credits (C)	25	25	25	25	100
Semester Credit Points (CP) (SGPA x C)	180.5	200.5	207.5	213.8	802.3

Aggregate Percentage of Marks = 2569 / 3200 = 80.28**%**

Classification of Result: First Class Exemplary

Cumulative Grade Point Average (CGPA) = Total of Semester CP / Total Credits for the program = 802.3 /100**= 8.02**

Program Alpha Sign Grade: A^+

iii) Calculation of Cumulative Grade Point Average (CGPA) for the Bachelor Degree: Illustration-III

Semester	I	II	III	IV	V	VI	Total
Total Marks per Semester	800	800	800	800	600	600	4400
Total Marks Secured	580	641	664	684	490	499	3558
Semester Alpha Sign Grade	A	A+	A+	A+	A+	A+	-
Semester GPA	7.22	8.02	8.30	8.55	8.17	8.32	-
Semester Credits (C)	25	25	25	25	24	24	148
Semester Credit Points (CP) (SGPA x C)	180.5	200.5	207.5	213.8	196.1	199.7	1198.1

Aggregate Percentage of Marks = 3558 / 4400 = 80.86**%**

Classification of Result**: *First Class Exemplary***

Cumulative Grade Point Average (CGPA) = Total of Semester CP / Total Credits for the program = 1198.1 /148**= 8.10**

Program Alpha Sign Grade: A^+

iv) Calculation of Cumulative Grade Point Average (CGPA) for the Bachelor Degree with Honours: Illustration-IV

Semester	I	II	III	IV	V	VI	VII	VIII	Total
Total Marks per Semester	800	800	800	800	600	600	600	600	5600
Total Marks Secured	580	641	664	684	490	499	467	506	4531
Semester Alpha Sign Grade	A	A+	A+	A+	A+	A+	A	A+	-
Semester GPA	7.22	8.02	8.30	8.55	8.17	8.32	7.78	8.43	-
Semester Credits (C)	25	25	25	25	24	24	22	22	192
Semester Credit Points (CP) (SGPA x C)	180.5	200.5	207.5	213.8	196.1	199.7	171.2.	185.5	1554.8

Aggregate Percentage of Marks = 4531 / 5600 = 80.91%

Classification of Result: ***First Class Exemplary***

Cumulative Grade Point Average (CGPA) = Total of Semester CP / Total Credits for the program = 1554.8 /192= **8.10**

Program Alpha Sign Grade: A^+

v) Calculation of Cumulative Grade Point Average (CGPA) for the Integrated Master's Degree: Illustration-V

Semester	I	II	III	IV	V	VI	VII	VIII	IX	X	Total
Total Marks per Semester	800	800	800	800	600	600	600	600	600	600	6800
Total Marks Secured	580	641	664	684	490	499	467	506	481	513	5525
Semester Alpha Sign Grade	A	A+	A+	A+	A+	A+	A	A+	A+	A+	-
Semester GPA	7.22	8.02	8.30	8.55	8.17	8.32	7.78	8.43	8.02	8.55	-
Semester Credits (C)	25	25	25	25	24	24	22	22	22	22	236
Semester Credit Points (CP) (SGPA x C)	180.5	200.5	207.5	213.8	196.1	199.7	171.2.	185.5	176.4	188.1	1919.3

Aggregate Percentage of Marks = 5525 / 6800 = 81.25%

Classification of Result: ***First Class Exemplary***

Cumulative Grade Point Average (CGPA) = Total of Semester CP / Total Credits for the program = 1919.3 /236= **8.13**

Program Alpha Sign Grade: A^+

These are the sample illustrations of computing Semester Grade Point Averages (SGPA) and Cumulative Grade Point Averages (CGPA) and the Alpha – Sign Grades assigned.

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

2021-22

Syllabus

Name of the Programme: Bachelor of Commerce (B.Com.)

Course Code: B.Com. 1.1 (DSC)

Name of the Course: Financial Accountancy

Course Outcomes: On successful completion of the course, the Students will be able to • Understand the Basic Concepts of Accountancy

• Exercise the accounting treatments for consignment transactions & events in the books of consignor and consignee.

• Demonstrate various accounting treatments for dependent branches

• Learn various methods of accounting for hire purchase transactions.

• Outline the emerging trends in the field of accounting

• Demonstrate e-Treatment of Accountancy Syllabus

Module No. 1: Introduction to Accountancy (10 Hrs.) Introduction – Meaning, Definition of Accounting – Uses & Users of Accounting – Accounting Principles - Accounting process – Types of Reconciliation (Concepts) – Recognition of Capital & Revenue and Problems on Accounting Equation (Operating in Spreadsheet).

Module No. 2: Consignment Accounts (12 Hrs.) Introduction-Meaning of Consignment - Consignment Vs Sales -Proforma Invoice -Accounts Sales -Types Commission - Accounting for Consignment Transactions & Events in the books of Consignor only - Treatment of Normal & Abnormal Loss. - Valuation of Closing Stock-Goods sent at Cost Price and Invoice Price. (Operating in Spreadsheet)

Module No. 3: Accounting for Branches (12 Hrs.) Introduction – Meaning – Objectives – Types of Branches –Meaning and features of Branches - Dependent Branches – Independent Branches – Foreign Branches – methods of Maintaining books of Accounts by Head office – Meaning & Feature of Debtor system, stock & Debtor system, wholesale branch system and Final Account system – Supply of Goods at Cost Price & Invoice Price - Problems on preparation of Dependent Branch A/c in the books of Head Office under Debtor system only. (Operating in Spreadsheet)

Module No. 4: Leasing & Hire Purchase (14 Hrs.) Leasing – Elements of lease – Major Components of Lease Agreement – Types of Leasing – Leasing Financial institution in India. (Theory) - Hire Purchase - Meaning of Hire Purchase and Instalment Purchase System- difference between Hire Purchase and Instalment Purchase – Important Definitions – Hire Purchase Agreement – Hire Purchase Price – Cash Price – Hire Purchase Charges – Net Hire Purchase Price – Net Cash Price – Calculation of Interest – Calculation of Cash Price – Journal Entries and Ledger Accounts in the books of Hire Purchaser (Asset Accrual Method only). (Calculation of EMI in Spreadsheet)

Module No. 5: Emerging Trends in Accounting (08 Hrs.) 3 Digital Transformation of Accounting-Big Data Analytics in Accounting- Accounting through Cloud Computing - Green Accounting - Human Resource Accounting - Inflation Accounting - Database Accounting (Concepts only)

Bachelor of Commerce (B.Com.)

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

Course Code: B.Com. 1.2 (DSC)

Name of the Course: Business Management & Startups

Course Outcomes: On successful completion of the course, the Students will be able to ● Design and demonstrate the strategic plan for the attainment of organizational goals.

● Compare and choose the different types of motivation factors and leadership styles. ● Understand startups Opportunities and Financial Issues of Startups

● Understand the support extended by Incubators & Major Startups Incubators in India.

● Understands Government Initiatives for Startups in India. Syllabus

Module No. 1: Principles & Functions of Management (12 Hrs) Introduction – Meaning – Definitions – Importance & scope of management - Principles of Management. Managerial Functions: Meaning, Definition, Characteristics, benefits & Limitations of Planning, organizing, Directing, Coordinating & Controlling - Task & Responsibilities of Professional Manager.

Module No. 2: Leadership & Motivation (14 Hrs) Leadership: concept – Importance – Major Theories of leadership (Likert's scale Theory, Blake & Mouton's Managerial Grid theory, House Path Goal theory, Fred Fielder's situational leadership). Modern Leadership styles in the changing world (Charismatic leadership, Transformational leadership, Visionary Leadership, Transactional Leadership, Servant Leadership, Situational Leadership). Motivation: Concept & importance of Motivation – Contemporary Motivation Theories (Expectancy Theory, Equity Theory, Goal Setting Theory, Reinforcement theory)

Module No. 3: Startups & Its Financial Issues (10 Hrs) Introduction- Meaning – Features – Types of Startups – Ideation – Design Thinking, Entrepreneurship Lessons for Startups, 3 Pillars to Initiate startup (Handholding, Funding & Incubation). Startup Financial issues: feasibility Analysis- The cost & Process of Raising capital – Unique Funding issues of a High tech Ventures – funding with equity – Financing with debt – funding strategies with bootstrapping – Crowdfunding – Venture Capital.

Module No. 4: Incubation Support to startups (10 Hrs) Introduction- Meaning & definition of Incubation support – Objectives & Functions of Incubation Centers - Services Types – Incentives for Incubators – Role of Incubators in startup Policy, List of Major Startups Incubators in India - Case studies on Startups.

Module No. 5: Government Initiatives for Startups in India (10 Hrs) Government Initiatives – Startup India Initiative, Seed Fund – ASPIRE –SAMRIDDHI Scheme – Mudra Scheme (Sishu, Kishore & Tarun) – ATAL Innovation Mission – MSME Multiplier Grants Scheme – Credit Guarantee fund trust for micro & small business – Software Technology Park – Venture Capital Assistance Scheme – Single Point Registration scheme – M-SIPS – Self Employment & Talent Utilization (SETU)

Bachelor of Commerce (B.Com.)

Course Code: B.Com. 1.3 (DSC)

Name of the Course: Principles of Marketing

Course Outcomes: On successful completion of the course, the Students will be able to

● Understand the basic concepts of marketing and assess the marketing environment.

● Analyse the consumer behaviour in the present scenario and marketing segmentation.

● Discover the new product development & identify the factors affecting the price of a product in the present context.

● Judge the impact of promotional techniques on the customers & importance of channels of distribution.

● Outline the recent developments in the field of marketing. Syllabus

Module No. 1: Introduction to Marketing (12 Hrs) Fundamentals of Marketing : Importance and Scope of Marketing; Elements of Marketing Mix; Approaches of Marketing. Analyzing the Marketing Environment: Components of Environment; Micro & Macro Environment; Environment specific to the firm; Global Environment , consumer environment, technology environment, competition environment. Value Philosophy in Marketing: Understanding the value philosophy, Meaning of value; Value Creation and Delivery; Value Delivery Process; Value Delivery and Upstream Marketing; Value Innovation; Co-creation of value

Module No. 2: Consumer Behaviour & Market segmentation (12 Hrs) Introduction - Factors influencing Consumer Behaviour; Buying Decision Process; Theories of Consumer Decision Making Marketing Research Key terms and process of market research; Role of Market Research in the decision making system. Market Segmentation, Targeting, Differentiation & Positioning: Levels of Segmentation; Basis for Segmenting Consumer and Business Markets; Market Targeting , Developing, Communicating and Positioning Strategy.

Module No. 3: Product and Pricing Strategy (12 Hrs) Product Levels; Classifying products; Product Range, Line, Mix; Product Life Cycles; New Product Development, New Service Development; Stages of Product Development; Adoption Process. Pricing to Capture Value: Pricing Environment; Consumer Psychology & Pricing; Pricing Philosophy; Methods of Pricing; Price Adaptations; Initiating Price Changes; Responding to Competitors' Price Changes

Module No. 4: Marketing Channels & Promotional Strategy (12 Hrs) Marketing channels, Functions; Physical Distribution. and Value Networks; Channel Design Decisions; Channel Management Decisions; Channel Integration and Systems; E-commerce, E- Retailing. Promoting Value: Marketing Communications; Personal Influencers; Marketing Communications Mix - Advertising, Sales Promotion, Personal Selling, Direct Marketing; Public Relations. 7

Module No. 5: Advancements in Marketing: (Concepts only) (08 Hrs) Advancements in Marketing - Social Marketing, online marketing - Search Engine Optimization (SEO)- Green marketing, Rural Marketing; Mobile Marketing - Marketing Analytics - Social Media Marketing - Email Marketing - Live Video Streaming Marketing - Network Marketing, Affiliate Marketing , Chatbots, Influencer Marketing, Global Marketing, Experiential Marketing, Relationship Building and Customer Retention, Strategic Alliances and Networks

Name of the Programme: Bachelor of Commerce

Course Code: B.Com 1.4 (SEC – SB) Name of the Course: Digital Fluency

Course Outcomes: On successful completion of the course, the Students will be able to

● Understand the Fundamentals of computers.

● Work in Word Processor effectively.

● Discover the arena of the Internet and its possibilities.

● Effectively communicate through Email Syllabus

Module No. 1: Fundamentals of Computer (04 Hrs) Introduction – Objectives - Computer, Mobile/ Tablet and their application - Components of a Computer System - Central Processing Unit- Common Input & Output devices - USB ports and Pen Drive - Connecting Power cord, Keyboard, Mouse, Monitor and Printer to CPU

Module No. 2: Word Processor (16 Hrs) Introduction – Objective -Word Processing Basic - Opening Word Processing Package - Title Bar, Menu Bar, - Toolbars & Sidebar - Creating a New Document - Opening and Closing Documents- Opening Documents - Save and Save As - Closing Document - Using The Help - Page Setup - Print Preview - Printing of Documents - PDF file and Saving a Document as PDF file - Document manipulation & Formatting - Text Selection - Cut, Copy and Paste - Font, Color, Style and Size selection - Alignment of Text - Undo & Redo - Spelling & Grammar - Shortcut Keys

Module No. 3: Internet (04 Hrs) Introduction – Objectives – Internet - protocols: HTTP, HTTPS, FTP - Concept of Internet & WWW - Website Address and URL - Applications of Internet - Modes of Connecting Internet (Hotspot, Wi-Fi, LAN Cable, Broadband, USB Tethering) - Popular Web Browsers (Internet Explorer/Edge, Chrome, Mozilla Firefox,) - Exploring the Internet - Surfing the web - Popular Search Engines - Searching on Internet

Module No. 4: E-mail (04 Hrs) Introduction -Objectives - Structure - protocols: SMTP, IMAP, POP3 - Opening Email account - Mailbox: Inbox and Outbox - Creating and Sending a new E-mail - CC – BCC- Replying -Mail Merge- Forwarding - attachments – Scheduling – Password Protect – Delete.

Name of the Programme: Bachelor of Commerce (B.Com.)

Course Code: B.Com. 2.1 (DSC)

Name of the Course: Advanced Financial Accounting

Course outcomes: On successful completion of the course, the Students will be able to ● Understand and compute the amount of claim for loss of stock and the concept of loss of profit. ● Deal with the inter-departmental transfers and their accounting treatment. ● Prepare financial statements from incomplete records. ● Learn to deal with accounting for royalty transactions. ● Compute Average Due Date and preparation of Account current.

Module No. 1: Insurance Claims for Loss of Stock and Loss of Profit (10 Hrs.) Meaning of fire claim - Features and Principles of Fire Insurance. Concept of Loss of Stock - Loss of Profit and Average Clause. Computation of Claim for loss of stock (including Over valuation and Under Valuation of Stock, Abnormal Items) and application of Average Clause.

Module No. 2: Departmental Accounts (12 Hrs.) Meaning - Advantages - Disadvantages. Method of departmental accounting. Basis of allocation of common expenditure among various departments. Types of departments and inter-department transfers at cost price and invoice price (Theory and proforma journal entries). Preparation Departmental Trading and Profit and Loss Account including inter departmental transfers at Cost Price only.

Module No. 3: Conversion of Single Entry into Double Entry (12 Hrs.) Meaning - Features - Merits - Demerits - Types of Single Entry System - Differences between Single Entry System and Double Entry System - Need and Methods of conversion of Single Entry into Double Entry - Problems on Conversion of Single Entry into Double Entry (Simple Problems only).

Module No. 4: Royalty Accounts (12 Hrs.) Royalty and Royalty agreement - Introduction - Meaning - Definition - Differences between Rent and Royalty - Types of Royalty - Terms used in Royalty – Lessor – Lessee – Short Workings – Irrecoverable Short Workings - Recoupment of Short Workings – Surplus Royalty - Methods of Recoupment of Short Workings – Fixed and Floating methods - Preparation of Royalty Analysis Table (Excluding Government Subsidy) - Journal Entries and Ledger Accounts in the books of Lessee only – i) When Minimum Rent Account is opened ii) When Minimum Rent Account is not opened. Note: Problems including Strikes and Lockouts, but excluding sub-lease.

Module No. 5: Average Due Date and Account Current (10 Hrs.) Average Due Date: Meaning - Concept - Uses of. Calculation of Average Due Date: i)Where amount is lent in one installment ii)Where amount is lent in various installments iii)Taking Grace Days into account iv)Calculation of Due Date few months after date / Sight. Account Current: Meaning – Need and Situation leading to Account Current Preparation Account Current with the help of : i) Interest table. ii) By Means of Product.

Name of the Programme: Bachelor of Commerce (B.Com.)

Course Code: B.Com. 2.2 (DSC)

Name of the Course: Business Ethics

Course outcomes: On successful completion of the course, the Students will be able to

● Understanding the importance of ethical behavior in business and the community.

● Provide skills for recognising and resolving ethical issues in business;

● Critical self-examination of one's own values, as well as appreciation for the relevance of personal values in the business/workplace.

● Encourage self-reflection on the ethical dimensions of your own decisions in the workplace.

Module No. 1: Nature and Essence of Business Ethics (08 Hrs) Meaning of Ethics, Scope & Importance of Ethics, Types of Ethics. Business Ethics: Introduction, Meaning, Characteristics, Importance, Factors Influencing Business Ethics, Principles & Scope of Business Ethics, Approaches to the study of Business Ethics, Arguments for and against Business Ethics.

Module No. 2: Personal & Professional Ethics (12 hours) Personal Ethics - Meaning, Principles of Personal Ethics, Importance, Emotional Honesty, Virtue of Humility, Karma Yoga concept (Meaning & Principles). Professional Ethics - Concept & Emergence of Professional Ethics, Need for Professional Ethics, Ethical Dilemmas in Profession – Healthcare, Education, Corporate, Social work. Reasons for the crisis of Professional Ethics (Nepotism, favoritism etc.), Moral Entrepreneur (Meaning only)

Module No. 3: Business Ethics in Marketing & Finance (12 hours) Meaning of Marketing, Need of Ethics in Marketing, Ethical dilemmas in Marketing, Unethical practices in Marketing, Ethical issues in Advertising, Promotions and Distribution, Common deceptive marketing practices, Role of Consumerism. Meaning of Finance, Ethics in Finance, Need of Ethics in Finance, Scope & Code of Ethics in Finance, Unethical practices in Finance. Creative Accounting – Definition, Importance and

Methods; Earnings Management & Accounting Fraud; Hostile takeovers in India; Case study: Kingfisher Airlines Scam, Satyam Scam.

Module No. 4: Business Ethics in HRM & IT (12 hours) HRM – Meaning, Definition, Need and Types. Areas of HRM ethics, Ethical issues in HR, Unethical practices of HRM, Meaning & Importance of Workplace Ethics, Role of Management in inculcating workplace ethics, Factors shaping ethical behavior at work, Importance of Employee Code of Conduct, Ethical Leadership (meaning). IT – Ethical issues relating to Computer Applications, Information Security, Security Policies & Procedures, Information Protection, Ethical codes in Information Technology, Reducing threat to Information Systems. Objectives and Features of Cyber Laws in India, Objectives and Features of The Information Technology Act 2000, Computer Crime & Computer Viruses – Meaning, Types & Prevention. Ecological Ethics: Environment Protection and pollution control by businesses.

Module No. 5: Corporate Governance & Corporate Social Responsibility (12 hours) 5 Corporate Culture - Meaning, Characteristics, Importance, Positive and negative impact of corporate culture in business, Role of CEOs in shaping business culture. Corporate Governance - Meaning, Scope, Characteristics, Principles, Benefits, Limitations, Corporate Governance Norms, Changes in Corporate Governance issues as per Companies Act 2013. Various Committees on Corporate Governance – Board of Directors, Appointment & Duties; Cadbury Committee, Narasimhan Committee, Narayana Murthy Committee. CSR: Concept, Scope, Types, CSR Principles & Strategies, Importance of CSR in contemporary society, Various models of CSR.

Name of the Programme: Bachelor of Commerce (B.Com.)

Course Code: B.Com. 2.3 (DSC)

Name of the Course: Banking Innovations

Course Outcomes: On successful completion of the course, the Students will be able to

● Understand the Banking System in India.

● Understand the procedure involved in opening and operating different accounts.

● Understand the procedure involved in Availing different types of Loans.

● Examine the different types of negotiable instruments & their relevance in the present context.

● Understand the technology in Banking.

Module No. 1: Banking System in India (12 Hrs) Meaning, Definitions and Features of a Bank. Meaning, Definitions and Features of Banking. Features of Indian Banking System. Reserve Bank of India – Role and Functions. Commercial Banks - Meaning, Nature and Functions. Special types of banks - Women Bank, Payments Bank, Savings Bank, Microfinance Banks, Regional Rural Banks, Foreign Banks, Industrial Development Banks, Cooperative Banks, Agricultural Development Banks. Public Sector and Private Sector Banks. Banking Sector Reforms - Narasimham Committee Report – I and II. Basel Norms I, II and III. CIBIL – Meaning, Objectives, Features and Benefits.

Module No. 2: Banker and Customer Relationship (10 Hrs) Meaning of Banker and Customer. Importance of Banker-Customer Relationship. Types of Banker Customer Relationship - Special and General Relationship - Debtor and Creditor, Pledger and Pledgee, Licensor and Licensee, Bailor and Bailee, Trustee and Beneficiary, Agent and Principal , Advisor and Client. Termination of Relationship. Statutory Protection available to a Banker. Meaning Duties and Responsibilities of

Collecting Banker, Paying Banker, Lending Banker. Banking Ombudsman – Meaning, Features and Benefits.

Module No. 3: Banking Products (18 Hrs) Bank Accounts - Savings Bank Account, Current Account, Recurring Deposits Account, Fixed Deposits Account, Non Resident Indians Accounts, Pigmy Deposit Accounts, Other Special Accounts, Procedures and Documents involved in opening bank accounts (Online and Offline). Bank Advances - Principles of Bank Lending, Kinds of Loans – Short-term Loans, Cash Credit, Overdraft, Pledge, Hypothecation, Discounting and Purchase of Bills of Exchange, Letters of Credit, Retail Banking Services - Home loans, Auto Loans, Personal loans, Safe Lockers, Jewel Loans, Consumer Durable Loans, Education Loans. Auxiliary Services - Investment Services, Insurance services, Currency Exchange, Household payment services. Negotiable Instruments: Meaning, Definitions, Features and Types of Negotiable Instruments. Parties to Negotiable Instruments. Crossing, Endorsements, Payments and Collection of Cheques. Dishonor of Cheques and Cheques Truncation System.

Module No. 4: Innovations in Banking (10 Hrs) 7 Meaning and need of Banking Innovations. Core banking, E-Banking, Telebanking, Internet Banking, Mobile Banking, NEFT, RTGS, EFT, UPI, IMPS, ATM, ATM Card, Debit Card, Credit Card, Truncated Cheques, MICR Cheques, CryptoCurrency, Central Bank Digital Currency, SWIFT.

Module No. 5: Technologies used in Banking (06 Hrs) Types of Technology used in Banking - Augmented Reality, Block Chain, Robotic Process Automation, Quantum Computing, Artificial Intelligence, API Platforms. Prescriptive security - Meaning, Features and Benefits.

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

➢ 21USDSC1.8 - PROBLEM SOLVING TECHNIQUES

Total Teaching Hours: 48 No. of Hours / Week: 03

UNIT - I [12 Hours]

Introduction: The Role of Algorithms in Computing, Algorithms as a technology, Analyzing algorithms, Designing algorithms, Growth of Functions, Asymptotic notation, Standard notations and common functions. Fundamental Algorithms: Exchanging the values of two variables, Counting, Summation of a set of numbers, Factorial Computation, Generating of the Fibonacci sequence, Reversing the digits of an integer, Character to number conversion.

UNIT – II [12 Hours]

C Programming: Getting Started, Variables and Arithmetic expressions. Input and Output: Standard input and output, formatted output- printf, variable length argument list, formatted input-scanf. Control Flow: Statements and Blocks, If-else, else-if, switch, loops: while loop, for loop, do while, break and continue, goto and labels. Pointers and Arrays: pointers and address, pointers and function arguments, multidimensional array, initialization of pointer arrays, command line arguments.

UNIT - III [12 Hours]

Factoring Methods: Finding the square root of a number, the smallest Divisor of an integer, the greatest common divisor of two integers, computing the prime factors of an integer, generation of pseudo random numbers, raising a number to a large power. Array Techniques: Array order Reversal, Array counting or Histogramming, Finding the maximum number in a set, removal of duplicates from an ordered array, partitioning an array, Finding the kth smallest element, multiplication of two matrices.

UNIT - IV [12 Hours]

Merging: the two-way merge. Sorting: Sorting by selection, sorting by exchange, sorting by insertion, sorting by diminishing increment, sorting by partitioning. Searching: binary search, hash search. Text

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

processing and Pattern searching - text line length adjustment, keyword searching in text, text line editing, linear pattern search

➢ 21USDSC1.9 - DATA STRUCTURES

Total Teaching Hours: 48 No. of Hours / Week: 03

UNIT-I [12 Hours]

Introduction and Overview: Definition, Elementary data organization, Data Structures, data Structures operations, Abstract data types, algorithms complexity, time-space trade off. Preliminaries: Mathematical notations and functions, Algorithmic notations, control structures, Complexity of algorithms, asymptotic notations for complexity of algorithms. Arrays: Definition, Linear arrays, arrays as ADT, Representation of Linear Arrays in Memory, Traversing Linear arrays, Inserting and deleting, Multi-dimensional arrays, Matrices and Sparse matrices.

UNIT-II [12 Hours]

Linked list: Definition, Representation of Singly Linked List in memory, traversing a Singly linked list, searching in a Singly linked list, Memory allocation, Garbage collection, Insertion into a singly linked list, Deletion from a singly linked list; Doubly linked list, Header linked list, Circular linked list. Stacks: Definition, Array representation of stacks, linked representation of stacks, stack as ADT, Arithmetic Expressions: Polish Notation, Conversion of infix expression to postfix expression, Evaluation of Post fix expression, Application of Stacks, Recursion, Towers of Hanoi, Implementation of recursive procedures by stack. Queues: Definition, Array representation of queue, Linked list representation of queues. Types of queues: Simple queue, Circular queue, Double-ended queue, Priority queue, Operations on Queues, Applications of queues.

UNIT-III [12 Hours]

Binary Trees: Definitions, Tree Search, Traversal of Binary Tree, Tree Sort, Building a Binary Search Tree, Height Balance: AVL Trees, Contiguous Representation of Binary Trees: Heaps, Lexicographic Search Trees:

Tries, External Searching: B-Trees, Applications of Trees. Graphs: Mathematical Background, Computer Representation, Graph Traversal, Topological Sorting

UNIT-IV [12 Hours]

Searching: Introduction and Notation, Sequential Search, Binary Search, Comparison of Methods. Sorting: Introduction and Notation, Insertion Sort, Selection Sort, Shell Sort, Divide And Conquer, Merge sort for Linked List, Quick sort for Contiguous List. Hashing: Sparse Tables, Choosing a Hash function, Collision Resolution with Open Addressing, Collision Resolution by Chaining.

➢ 21USSEC1.4 - OFFICE AUTOMATION

Total Teaching Hours: 48 No. of Hours / Week: 03

UNIT-I

Basic Skills - In and out view of different components of computer (Hardware), booting the machine, GUI of desktop, input and output interfacing

UNIT-II

Word - Introduction Word - Uses of Word Processor – Working with Word - Explore the use of graphics and different fonts, understand and to make use of basic features of documents, Advanced Word Processing - Managing Document Changes - Advanced Editing and Formatting - Protecting and Sharing Documents - Customizing Documents - Using Macros, Quick parts, and Content Links - Using Fields, Forms, and Indexes

UNIT-III

Excel [Spreadsheets] - Introduction Spreadsheets - Uses of Spreadsheets - Anatomy of a Spreadsheet - Creating a Spreadsheet - Formatting a Spreadsheet- Explore the tools available in spreadsheets, including formulas and calculations, Inserting and working on Graphs, Using office backstage - Using basic formulas - Using functions -Formatting cells and Ranges - Formatting worksheets - Managing worksheets - Working

with data and Macros - Using advanced formulas - Securing and sharing workbooks - Creating charts - Adding pictures and shapes to a worksheet.

UNIT-IV

Power Point Presentation - Introduction Power point presentation (PPT) – Uses of PPT - Creating and Formatting a Presentation - Slide Show Mode, Speaker Notes, and Outline Mode - Drawing Diagrams - Tables and Charts, review each slide template - Duplicate, move and import slides - Insert pictures and video clips - manage add-ins and security options - Create handouts - Create and apply master slides - Manage proofing options - manage language options - Use "Presenter Tools"- Connect to the projection system.

UNIT-V

Use of Excel for Statistical Analysis - Data Classification and Presentation **-** Cumulative Frequency Distribution - Bivariate Frequency Distributions - Tabulation of Data - Graphical Representation - Other Forms of Representation Measures of Location and Dispersion **-** The Arithmetic Mean – The Median – The Mode – Geometric and Harmonic Mean – Other methods of Location: Quartiles, Deciles and Percentiles – Measures of Variations or Dispersion – The Variance and Standard Deviation. Correlation **-** Scatter diagram – correlation coefficient

UNIT-VI

ACCESS - Overview of Microsoft Access Databases – Design and Create Tables to Store Data – Simplify Data Entry with Forms - Obtain Valuable Information Using Queries - Create Professional Quality Output with Reports – Design and Implement Powerful Relational Databases - Build User Friendly Database Systems

II SEMESTER BCA SYLLABUS 2021-22

➢ 21USDSC2.7 - COMPUTER ARCHITECTURE

Total Teaching Hours: 48 No. of Hours / Week: 03

UNIT - I [12 Hours]

Number Systems: Binary, Octal, Hexadecimal numbers, base conversion, addition, subtraction of binary numbers, one's and two's complements, positive and negative numbers, character codes ASCII, EBCDIC. Computer Arithmetic: Addition and Subtraction, Multiplication and Division algorithms, Floating-point Arithmetic Operations, Decimal arithmetic operations. Structure of Computers: Computer types, Functional units, Basic operational concepts, Von-Neumann Architecture, Bus Structures, Software, Performance, Multiprocessors and Multicomputer, Digital Logic Circuits: Logic gates, Boolean algebra, Ma p Simplification, Combinational Circuits: Half Adder, Full Adder, flip flops, Sequential circuits: Shift registers, Counters, Integrated Circuits, Mux, Demux, Encoder, Decoder. Data representation: Fixed and Floating point

UNIT - II [12 Hours]

Basic Computer Organization and Design: Instruction codes, Computer Registers, Computer Instructions and Instruction cycle. Timing and Control, Memory-Reference Instructions, Input-Output and interrupt. Central processing unit: Stack organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Complex Instruction Set Computer (CISC) Reduced Instruction Set Computer (RISC), CISC vs RISC

UNIT - III [12 Hours]

Register Transfer and Micro-operations: Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-Operations, Logic Micro-Operations, Shift Micro-Operations, Arithmetic logic shift unit. Micro-programmed Control: Control Memory, Address Sequencing, Micro-Program example, Design of Control Unit. Input Output: I/O interface, Programmed IO, Memory Mapped IO, Interrupt Driven IO, DMA. Instruction level parallelism: Instruction level parallelism (ILP)-over coming data hazards, limitations of ILP

UNIT - IV [12 Hours]

Memory System: Memory Hierarchy, Semiconductor Memories, RAM(Random Access Memory), Read Only Memory (ROM), Types of ROM, Cache Memory, Performance considerations, Virtual memory, Paging, Secondary Storage, RAID. Multiprocessors And Thread level Parallelism: Characteristics of multiprocessors, Multi-Threaded Architecture, Distributed Memory MIMD Architectures, Interconnection structures,

➢ 21USDSC2.8 - OBJECT ORIENTED PROGRAMMING USING JAVA

Total Teaching Hours: 48 No. of Hours / Week: 03

UNIT-I [12 Hours]

Introduction to Java: Basics of Java programming, Data types, Variables, Operators, Control structures including selection, Looping, Java methods, Overloading, Math class, Arrays in java. Objects and Classes: Basics of objects and classes in java, Constructors, Finalizer, Visibility modifiers, Methods and objects, Inbuilt classes like String, Character, String Buffer, File, this reference

UNIT-II [12 Hours]

Inheritance and Polymorphism: Inheritance in java, Super and sub class, Overriding, Object class, Polymorphism, Dynamic binding, Generic programming, Casting objects, Instance of operator, Abstract class, Interface in java, Package in java, UTIL package.

UNIT-III [12 Hours]

Event and GUI programming: Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames, Layout Managers: Flow Layout, Border Layout, Grid Layout, GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box, Applet and its life cycle, Introduction to swing, Exceptional handling mechanism. I/O programming: Text and Binary I/O, Binary I/O classes, Object I/O, Random Access Files.

UNIT-IV [12 Hours]

Multithreading in java: Thread life cycle and methods, Runnable interface, Thread synchronization, Exception handling with try-catch-finally, Collections in java, Introduction to JavaBeans and Network Programming.

➢ 21USDSC2.9 - DATABASE MANAGEMENT SYSTEMS

Total Teaching Hours: 48 No. of Hours / Week: 03

UNIT - 1 [12 Hours]

Databases and Database Users: Introduction, An example, Characteristics of the Database Approach, Actors on the Scene, Workers behind the Scene, Advantages of Using DBMS Approach, A Brief History of Database Applications, When Not to Use a DBMS. Database System Concepts and Architecture: Data Models, Schemas, and Instances, Three-schema Architecture and Data Independence, Database Languages and Interfaces, The Database System Environment, Centralized and Client-Server Architectures, Classification of Database Management Systems.

UNIT - 2 [12 Hours]

Data modelling using Entity-Relationship Model: Using High-Level Conceptual Data Models for Database Design, An Example Database Application, Entity Types, Entity Sets, Attributes and Keys, Relationship Types, Relationship Sets, Roles and Structural Constraints, Weak Entity Types, Refining the ER Design Company Database Diagrams, Naming Conventions and Design. Issues, File organization and storage, secondary storage devices, type of single level ordered index, multi-level indexes, indexes on multiple keys, other types of indexes.

UNIT – 3 [12 Hours]

Relational Model and Relational Algebra: Relational Model Concepts, Relational Model Constraints and Relational Database Schemas, Update Operations, Transactions and Dealing with Constraint Violations, Unary Relational Operations: SELECT and PROJECT, Relational Algebra Operations from SET Theory, Binary Relational Operations: JOIN and DIVISION, Additional Relational Operations, Examples of Queries in Relational Algebra. Relational Database Design: Anomalies in a database, functional dependency, normal

forms, lossless join and dependency, BCNF, normalization through synthesis, higher order normal forms. SQL- SQL Data Definition and Data Types, Specifying Constraints in SQL, Schema Change Statements in SQL, Basic Queries in SQL, More Complex SQL Queries, Insert, Delete and Update Statements in SQL, Specifying Constraints as Assertion and Trigger, Views (Virtual Tables) in SQL, Embedded SQL, Dynamic SQL,

[12 Hours]

UNIT – 4

Introduction to transaction processing, transaction and system concepts, desirable properties of transactions, transaction support in SQL. Concurrency control techniques: two-phase locking techniques, concurrency control based on timestamp ordering. Recovery techniques: recovery concepts, recovery in multi-database systems, database backup and recovery from catastrophic failures.

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

SURANA COLLEGE
(AUTONOMOUS)

16, SOUTHEND ROAD, BANGALORE -560004

RE-ACCREDITED BY NAAC WITH "A+" GRADE

SYLLABUS - JOURNALISM

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

As per university guidelines, we are not changing the syllabus of Journalism for the academic year 2021-22. We are following the BU New NEP syllabus for 2021-22.

BANGALORE UNIVERSITY

DEPARTMENT OF COMMUNICATION

JNANABHARATHI CAMPUS BANGALORE-560056

Submitted to Faculty of Arts

CHOICE BASED CREDIT SYSTEM

Approved Syllabus

BOS Approved Syllabus for

Five-year Integrated Master's Programme

in Journalism and Mass Communication

(NEP 2021)

Syllabus for I & II Semester

(EFFECTIVE FROM ACADEMIC YEAR 2021-22)

SEPTEMBER 2021

MASTER'S PROGRAMME IN JOURNALISM AND MASS COMMUNICATION

Programme: Five-year Integrated Master's Programme in Journalism and Mass Communication to be introduced under NEP

Programme Objectives:

- Five-year Integrated Course in Journalism and Mass Communication would aim to familiarize students with all aspects of the field of journalism. They become more proficient in both theory and practical skills of the media in general.

- The programme would make prepare the students 'ready-to-be recruited by media houses. The content of the programme is designed to be dynamic and incorporate changes to meet requirements of the industry.

Programme Outcome:

- The programme aims to churn out responsible media professionals.

- The programme aims to facilitate better career opportunities for all those students of this course.

- The programme aims to strike a balance between the professional and the professional ethics in the field of journalism and mass communication.

Need for Curriculum Development:

As per the NEP 2020 initiatives, it is intended to formulate a Curriculum to eliminate the disparities among the students studying in different Universities/Institutes. The need for the curriculum development in Journalism and Mass Communication emerges due to the following reasons:

Changing Media Scenario: The evolution of the media has been fraught with concerns and problems. Accusations of mind control, bias, and poor quality have been thrown at the media on a regular basis. Yet the growth of communications technology has allowed media to attain Industry Status in India. The dependency of the masses on media has significantly increased and the recommended curriculum is prepared in this context to students to utilize the growing opportunities and equip themselves to be on par with industry requirements.

Credit transfer: Credit transfer is approved by the UGC and the Government that allows the students to transfer course from their existing university to a new UGC approved university. The same number of credits in all the Universities in Karnataka is the first step to towards the credit transfer from University to University.

Skill Enhancement: The new curriculum focuses more on hands on training, internship and thereby enhancing the skills of the students. The papers like Writing for Media, photo journalism etc., further helps in skill development of students.

Pedagogy:

The goal of Journalism and Mass Communication pedagogy is to stir student's critical consciousness and empower them with the knowledge, multimedia tools that help them in employability.

Importance to Theory and Practical's and its application: The Journalism and Mass Communication curriculum focuses on the practical components and gives importance to its application through hands-on and empirical training.

Utilisation of ICT: To enhance critical and creative thinking amongst students, ICT tools are incorporated into the teaching methods which include research-led teaching, via presentations through smart classrooms, and practical productions.

Research-based and Research-led teaching: The Research Projects and practicals are introduced in the curriculum. The student will be required to do research project on a topic of their choice under the supervision of a research guide.

Brain Storming Approach: Students will be involved in groups and individual discussions. This will help the students to develop and involve in the process of critical thinking.

Exit Options and Credit Requirements:

A Certificate / Diploma/ Bachelor Degree or Bachelor Degree with Honours in Journalism and Mass Communication is awarded at the completion of every progressive year.

Exit Option with	Certificate/Diploma/Degree/ Honors
Successful completion of First year (two semesters)of the four years multidisciplinary undergraduate Degree programme.	Certificate in Journalism and Mass Communication
Successful completion of Second year(four semesters)of the four years multidisciplinary undergraduate Degree programme	Diploma in Journalism and Mass Communication
Successful completion of Three year (six semesters) of the four years multidisciplinary undergraduate degree programme	Bachelor of Arts Degree in Journalism and Mass Communication
Successful completion of Four year (eight semesters) of the four years multidisciplinary undergraduate degree programme	Bachelor of Arts Degree with Honours in Journalism and Mass Communication
Successful completion of Five year(Ten semesters)of the Five years multidisciplinary degree programme	Master of Arts Degree With Honours in Journalism and Mass Communication

A student will be allowed to enter/re-enter only after the odd semester and they can only exit after even semester. Re-entry at various as lateral academic programmes based on the above mentioned earned proficiency test records. The validity of the eared credit will be for a maximum period year or as specified by the academic bank of credits (ABC).

Acronyms Expanded	
AECC	Ability Enhancement Compulsory Course
DSCC	Discipline Specific Core Course
SEC/SB/VB	Skill Enhancement Course- Skill Based/Value Based
OEC	Open Elective Course
DSE	Discipline Specific Elective

Continuous Internal Evaluation and Semester End Examination:

Total marks for each course shall be based on continuous assessments and term end examinations. As per the decision of the Karnataka State Higher Education Council, it is necessary to have uniform pattern of Continuous and comprehensive Assessment and Semester End examinations respectively, among all the Universities, their affiliated and autonomous colleges. The state level committee deliberated on the same and suggested the following pattern for the Continuous Internal Evaluation. The BOS has also approved to follow the same pattern.

COURSE PATTERN AND SCHEME OF EXAMINATION FOR FIVE-YEAR INTEGRATED MASTER'S PROGRAMME IN JOURNALISM AND MASS COMMUNICATION

AS PER NEP (2021-22 AND ONWARDS)

SUBJECT: JOURNALISM AND MASS COMMUNICATION																			
Semester	**Course Code**	**Title of the Papers**	**Teaching Hours**	**Hours/ Week**		**Examination Pattern**							**Total Marks/Paper**	**Duration of Exams (Hours)**		**Credits**		
						Theory				**Practical's**								
				Theory	**Practical's**	**Max.**		**IA**	**Total**	**Max.**		**IA**	**Total**		**Theory**	**Practical**	**Theory**	**Practical's**	**Total**
I	DSC – 1	Introduction to Journalism	60	04	04	60		40	100	25		25	50	150	3	2	04	02	06
	OE-1	Writing for Media	45	02	04	30		20	50	25		25	50	100	2	2	02	02	04
II	DSC- 2	Computer Applications for Media	60	04	04	60		40	100	25		25	50	150	3	2	04	02	06
	OE-2	Photo Journalism	45	02	04	30		20	50	25		25	50	100	2	2	02	02	04

DSC 1: INTRODUCTION TO JOURNALISM

Course Title and Code	DSC 1-Introduction to Journalism		
Programme Title	Bachelor of Arts in Journalism and Mass Communication		
Credits	06	Semester	I
Course Type	Core	Academic Year	2021-22

Pedagogy: Theory:4hrs/week
Practical: 4 hrs/week
Total: 6credits

Course objectives:

- To introduce the concept of media and mass communication.
- To familiarize the students with different facets of journalism
- To educate the students about the role of journalism and the development of society.

Learning Outcome

At the end of the course, the students should be able

- To identify the distinct nature of journalism and its professional aspects, including career opportunities
- To recognize and use terms specific tomedia
- To recognize the significance of changes in the practice ofjournalism

Unit I:

Definition of journalism – nature and scope of journalism; Significance of journalism in 21st century – qualities, duties, responsibilities and ethics of journalists; Influence of journalism on society and development

Unit II:

History of Journalism – Development of journalism in the world; A brief history of journalism in India –A brief history of Kannada press; Role of journalism during freedom struggle and growth of the press after Independence; Challenges faced by the present day journalism world over, with special reference to India.

Unit III

Glossary of journalism--Basic terms used in the press and media in general; Traditional and modern branches of journalism like magazine journalism, community journalism, investigative journalism, development journalism, business journalism, radio and TV journalism and multimedia journalism, etc; Rise of advocacy, professionalism, broadcast and new media journalism.

Unit IV:

Theories of press and their relevance to the present day – journalism as a profession; Professional organizations--Press Council of India; Starting a newspaper; Career opportunities in journalism.

Practical:

- Developing journalistic skills in students by giving assignments to write on any topic of their choice (Minimum of 5 assignments should be written)
- Practicing different types of writings in newspapers like crime, press conference, public grievance, business reports and Sports.
- Writing articles, features ,editorials and middles(Minimum of 5assignments)
- Writing for New media (Minimum of 5assignments)

Books for reference:

1. A Very Short Introduction to Journalism by Oxford Press
2. Mass Communication in India-- Keval J Kumar
3. Global Journalism--An introduction by Vera Slavtecheva, Michel Bromley
4. Understanding Journalism by Barun Roy
5. Mass Communication and Journalism in India by D S Mehta

OE 1: WRITING FOR MEDIA

Course Title and Code	OE 1-Writing for Media		
Programme Title	Bachelor of Arts in Journalism and Mass Communication		
Credits	04	Semester	I
Course Type	Core	Academic Year	2021-22

Pedagogy: Theory: 2hrs/week
Practical: 4hrs/week
Total: 4credits

Course Objectives:

- **To familiarize the students with writing skills for media**
- **To enhance the students interest in writing for media**
- **To equip the students with recent trends in media writing.**

Unit-I:

Print Media: Introduction to writing for print media. Journalistic jargons, rules and ethics of writing for media. Forms of journalistic writing--news reporting, column, article, feature, editorial, letter to the editor, preparing press release etc.,). Content development: choosing a topic, identifying sources, gathering information and importance of rewriting,

Practical Exercises:

- □ Letters to editor-02
- □ Press releases-02
- □ Writing headlines-05
- □ Picture captions writing-05

Unit-II:

Radio: Introduction to writing for radio; Principles and elements of scripting: Aesthetics of language and grammar for radio scripting; Script design and different scripts formats.

Practical Exercises:

- □ Preparing script for a Radio Talk of 05 minutes-02.
- □ Readying script for radio jingle of 02minutes-02
- □ Reading News for Radio of 05minutes-02
- □ Podcast-02

Unit-III:

Television: Basic principles and techniques of TV writing; elements of TV scripting, language and grammar; TV script formats; Writing a script for entertainment programme and news.

Practical Exercises:

- □ Anchoring script for TVprogramme-2
- □ News reading script– 04 Minutes-2
- □ **Entertainment programme script-02Minutes**

Unit-IV:

New Media: Introduction to writing for online media; Writing techniques for new media. Content writing for social media (Facebook, Twitter, LinkedIn, Instagram). Introduction to blogging and current trends in Web Journalism.

Practical Exercises:

- □ Create your own e-mail address, Face book, Twitter, LinkedIn, Instagram accounts.
- □ Analyze the contents of any five news portals.
- □ Create a Word Press page.

Books for reference

1. History of Indian Journalism: Nadig Krishnamurthy- University of Mysore press
2. Dilwali, Ashok. (2002). All about photography. New Delhi: National Book Trust.
3. Kobre, Kenneth. (2000). Photo journalism. The professional approach (4th Ed).

   London: Focal Press
4. Horton, Brian. (2000). Guide to photojournalism. New York: McGraw-Hill
5. Chapnick, Howard. (1994). Truth needs no ally: Inside photojournalism. New York:

   University of Missouri Press
6. British Press Photographers Association. (2007). 5000 Days: Press photography in a changing world. London: David & Charles.
7. Nair, Archana. (2004). All about photography. New Delhi: Goodwill Publishing House.

DSC 2: COMPUTER APPLICATIONS FOR MEDIA

Course Title and Code	DSE 2- Computer Applications for Media		
Programme Title	Bachelor of Arts in Journalism and Mass Communication		
Credits	06	Semester	II
Course Type	Core	Academic Year	2021-22

Pedagogy: Theory: 4hrs/week
Practical: 4hrs/week
Total: 6credits

Objectives

- To introduce students to the basics of computers
- To familiarize the students to the applications of computers in print and electronic journalism
- To facilitate the students to learn the practical applications of computers at different levels in media

Unit-I

Computer: Evolution of computers, generation of computers, introduction to input and output devices--hardware and software (MS office and MS Publisher), Files and folders management.

UNIT-II

Various applications of computers in media: Text, Graphics, Drawings; Animation; Audio and Video software--Adobe audition and Premier Pro; Designing software—Media Software and application, media websites, digital paper and blogs and podcasts.

Unit-III

Internet: Evolution, concept, significance, elements, functions of Internet. Basics of e-mail, web browsers, search engines, basics of computer network—LAN, WAN. IP, Social Media and their applications.

UNIT-IV

Fundamentals of Multimedia: Definition, concepts and elements of multimedia. Application of multimedia for print, electronic and cyber media. Fundamentals of visual communication, Video conferencing, graphics andanimation

Practical

- Creating Power Point Presentation using Multimedia tools
- Designing an e-paper page
- Creating a blog with a content of your choice
- Record content of your choice using audio-recording software
- Designing a e-magazine
- Create a video public service Ad on 30seconds

Books for Reference

1. Sunder, R., 2000. Computers Today Ed.2, John Wiley,
2. Benedict, M., Cyberspace: First steps, ed. Cambridge, MA. MIT Press.
3. Chapman and Chapman, Digital Multimedia, Wiley Publication.
4. James C. Foust, Online Journalism: Principles and Practices of News for the Web.3 Scottsdale, AZ: Holcomb Hathaway.
5. Janet H. Murray, Hamlet on the Holodeck: The Future of Narrative in Cyberspace, New York: Free Press,1997
6. Macintosh, Advanced Adobe Photoshop, Adobe publishers.
7. Satyanarayana, R., Information Technology and its facets, Delhi, Manak2005.
8. Smith, Gene. Tagging: People-powered Metadata for the Social Web, Indianapolis, Indiana: New Riders Press, 2008.

OE 2: Photo Journalism

Course Title and Code	OE-2 Photo Journalism		
Programme Title	Bachelor of Arts in Journalism and Mass Communication		
Credits	04	Semester	II
Course Type	Core	Academic Year	2021-22

Pedagogy: Theory:4hrs/week
Practical: 2 hrs/week
Total: 4credits

Objectives:

- **To attract students towards photojournalism**
- **To familiarize the students to techniques of photography and photojournalism**
- **To give a practical knowledge in the field of photography**

Unit-I

Concept of Photography- Evolution of Photography; Different types of cameras--Manual, Digital and phone cameras; Types of Photography--light and light equipment; Latest trends in photography

Unit-II

Concept of photo journalism nature and scope of photo journalism; Qualifications, role and responsibilities of photo journalists; Sources of news for photo journalists.

Unit-III

Techniques of photo editing--Caption writing; Photo editing software; Leading press photographers and photo journalists in India.

Unit-IV

Mobile Journalism: Using smart phones for taking effective pictures and shooting videos; Editing photos and videos taken on smart phones; Uploading news photos / videos on digital platforms

Practical

- Students to shoot and submit nature photos (5), news photos (5) portraits (5) Human interest photos (5)
- Students to edit at least 10photographs
- Students to edit video of 3 minutes and upload on Digital platforms
- Caption Writing- practical (10captions)

Books for reference:

1. Milten Feinberg- Techniques of Photo Journalism
2. Michel Long ford- Basic Photography
3. Tom Ang- Digital Photography- Master classes
4. N Manjunath- Chayachitra Patrikodyama
5. Cyernshem G R- History of Photography

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

Name of the Program: Bachelor of Arts (Tourism)

Course Code: DSCT1

Title of the Course: Fundamentals of Tourism Industry

Course Credits	No. of Hours per week	Total No. of Teaching Hours
3 Credits	3Hrs	42 Hrs

Pedagogy: Classrooms lecture, tutorials, Group discussion, Seminar, Case studies & field work etc.,

Course Outcomes: On successful completion of the course, the Students will be able to

- To get an overview of the history and concepts of tourism
- To understand the various components of tourism
- To identify the emerging trends in tourism industry
- To grasp the various forms and types of tourism
- To be acquainted with the tourism Business
- To be familiarized with tourism in India

Syllabus

Module No. 1: History and Concepts of Tourism (8 Hrs)

Meaning and Definition, Objectives, Historical development of Tourism, Nature and Significance of Tourism Industry. Concept of Tourist/ Visitor/ Traveller/ Excursionist. Forms and types of Tourism.

Module No. 2: Components of tourism industry (10 Hrs)

Five A's Framework of Tourism - Major Components- Accessibility- Types of Transportation, Air Transportation, Water Transportation, Rail Transportation, Road Transportation. Accommodation- Primary Accommodation- Secondary Accommodation. Attractions- Nature based, Manmade, symbiotic. Minor Components- Activities- Air based activities, Water based activities, and Land based activities. Amenities- Ancillary services.

Module No. 3: Impacts of Tourism (08 Hrs)

Bhargavi
Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,

Positive and Negative Impacts of Tourism industry-Economical impacts, Environmental impacts, Socio- Cultural impacts, Political Impacts. Emerging trends in Tourism industry, The role of Technology in Tourism industry, Terrorism and Tourism.

Module No. 4 – Tourism Business (08 Hrs)

Nature of Tourism business, segments of Tourism business, factors contributing growth of Tourism business, Push and Pull factors of tourism, new issues and challenges in Tourism business, steps taken by Indian Government, Future of Tourism business in India.

Module No. 5– Tourism in India (08 Hrs)

MOT, DOT-GOK, ITDC, KSTDC, JLR, Incredible India Campaign, Tourism Slogans and Punch lines of Indian states, Tourism development schemes in India and Karnataka. Latest tourism policies (National and State).

Skill Development Activities:

- Maintain a database of top Airlines, Tour Operators, Hotels, Cruise Operators in India
- Analyse the effectiveness of the Incredible India campaign and Athithi Devobava campaign.
- Identify the motivations for a tourist to undertake a leisure vacation.
- Assess the potential of rural tourism destinations in India.
- Draft different types of tourism and allied industries.

Reference Books:

- Goeldner, C., & Ritchie, J.R. (2011). Tourism, Principles, Practices, Philosophies. New Jersey: John Wiley.
- Gee, Chuck Y., James C. Makens, and Dexter J.L. Choy. (1997). The Travel Industry, Van Nostrand Reinhold, New York.
- Roday. S, Biwal. A & Joshi. V. (2009). Tourism Operations and Management, Oxford University Press, New Delhi.
- Andrews, S. (2007). Introduction to tourism and hospitality industry. Tata McGraw-Hill.
- Pran Seth- Successful Tourism Management
- Burkart and Medik- Tourism Past, Present and Future
- A.K Bhatia- International Tourism Management
- Kings Publication- Tourism Business
- Panda, Mishra and Parida – Tourism Management, University Press, Hyd
- R.K Sinha – Growth and Modern Development of Tourism

Note: Latest edition of textbooks and reference Books may be used

Name of the Program: Bachelor of Arts (Tourism)
Course Code: DSCT2
Title of the Course: Tourism Geography

Course Credits	No. of Hours per week	Total No. of Teaching Hours
3 Credits	3Hrs	42 Hrs

Pedagogy: Classrooms lecture, tutorials, Group discussion, Seminar, Case studies & field work etc.,

Course Outcomes: On successful completion of the course, the Students will be able to

- To familiarize the students with aspects of tourism which have a relation with the subject matter of Geography
- To equip the students with the Knowledge of Tourism geography
- To lay emphasis on the importance of geography in travel and tourism.
- To be familiar with major tourism destinations in India.
- To provide the concept and types of geography related to tourism in India.

Syllabus

Module No. 1: Geography (08 Hrs)

Definition, Scope, Approaches, Branches of Geography, Five Themes of Geography- Location, Place, Human-Environment Interaction, Movement and Region. Importance of Geography in Tourism.

Module No. 2: Map Reading Skills (08 Hrs)

Latitude and Longitude, Knowledge of International Data Line, Altitude, Direction, Scale Representation, GIS and Remote Sensing, Time Zones, GMT Variation.

Module No. 3: Geography of Tourism In Karnataka (08 Hrs)

Physiography: Location, Size and Extent, Weather and Climate, Rivers, Mountains, Rainfall Distribution, Natural Vegetation-with special reference to Western Ghats and Soil. Case study on Monsoon Tourism.

Module No. 4 –Geography of Tourism in India (10 Hrs)

Outstanding Geographical features of India- Climate, Water Bodies, Flora and Fauna. Desert, Islands and Beaches. Mountain Tourist Resource- with special reference to the Himalayas and other Hill Stations across India. centres.

The seasonal incidence – floods, droughts, famine, causes & effects for different tourist
Module No. 5– Importance of Geography in Tourism (08 Hrs) Push factors and Pull factors, Significance of Tourism, Limitations of Tourism, Planning and development of tourism in different climatic regions. Case Studies on Island Tourism in Andaman & Nicobar- Hill Tourism in Udhagamandalam and Sikkim-Beach Tourism in Goa.

Reference Books:

- Burton and Rosemary Longman Edn, Travel Geography, 1999.
- Cooper, Chris and Bomifade, World Wide Destination, Geography of Travel and Tourism.
- Robinson H.A (1976), Geography of Tourism.
- Michael Hall, Geography of Travel and Tourism, Routledge, London.

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

SURANA COLLEGE
AUTONOMOUS

16, SOUTH END ROAD, BANGALORE-4

RE-ACCREDITED BY NAAC WITH "A+" GRADE

SYLLABUS –POLITICAL SCIENCE
2021-22
APPROVED BY BOS MEMBERS

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

80

PREAMBLE

Education is critical for realizing one's full potential, creating a more just and equal community, and advancing national progress. In terms of economic growth, social fairness and equality, scientific advancement, national integration, and cultural preservation, ensuring universal access to high-quality education is critical to India's continuing rise and leadership on the world arena. In this context,universal high-quality education is the most effective path ahead for developing and exploiting our country's vast skills and resources for the benefit of individuals, community, country, and globe. Over the next decade, India will have the world's largest young population, and our capacity to offer them with high-quality education and employment opportunities will decide the future of the country.

The Government of India accepted and approved (July 2020) the implementation of National Education Policy (NEP), which was drafted under the Chairmanship of well known Educationist and Scientist Dr Kasturirangan. The key objectives of the NEP are to: (a) revise and revamp all aspects of the education structure, regulation & governance. (b) create a new system aligned with inspirational goals of 21st century education, including the 2015 Sustainable Development Goals (Goal-4). (c)Development of the creative potential of each individual. (d) Equip the students with critical thinking & problem solving, social, ethical, emotional capacities and dispositions, which are need of hour to build better India.

The Government of Karnataka became the first State to set up the NEP Task Force, which submitted its report in November 2020 and was accepted by the Cabinet (December 2020). As a result, Bangalore University, Bengaluru is also taken necessary steps to implement the NEP goals (2020-2021 academic year) and also to go far beyond the traditional information creation and dissemination by incorporating them for a breakthrough with wider social and economic consequences.

The Board of Studies (BOS) in Political Science (UG), Bangalore University have drafted the syllabus which has also been taken by Surana College(Autonomous) with little bit of changes, intends to make substantial changes to its undergraduate and graduate programmes in order to satisfy the needs of students with a diverse set of talents, aspirations, and professional objectives. In this context, thesyllabus is prepared to equip the students to understand Political Science discipline in term of the basics concepts, thoughts and theories; critically relate the theoretical aspects of Political Science to the socio- economic and political realities, and to enhance the knowledge of the students on regional, national and global politics.

Program Objectives in Political Science

- To understand the importance of concepts in Political Science.
- To familiarize the students with the basic ideas thoughts and theories in Political Science.
- To help them to understand and make distinction among Political Theory, Political Philosophy and Political Science and help them to understand the importance of these in the national and global contexts.
- To help them to understand the emergence and growth of modern States and give them an idea of their functioning and relate them to the political realities.
- To equip them to critically relate the theoretical aspects of Political Science to the socio economic and political realities of our times.

Program Learning Outcomes in Political Science:

At the end of the successful completion of the course, the students will be able to-

- Acquire domain knowledge.
- Study and analyze political contexts from critical and constructive prospective.
- Have a better understanding of the working of various political institutions including decentralized institutions state legislatures and parliament and relate this functioning to the greater cause of nation building as a responsible citizen.
- Assess how global national and regional development affect polity and society.
- To gain critical thinking and develop the ability to make logical inferences about socio-economic and political issues, on the basis of comparative and contemporary political discourses in India.
- Contemplate about national and international issues involving States having different political ideologies and historical contexts.
- Pursue higher education such as Post Graduate Studies and Research in Political Science and in other interdisciplinary areas to provide qualitative insights to create a better world.

Model Curriculum

Name of the Degree Program: BA

Discipline Core: Political Science

Total Credits for the Program:

Starting year of implementation: 2021-22

Program Outcomes:

By the end of the program the students will be able to:

- Acquire domain knowledge.
- Study and analyze political contexts from critical and constructive prospective.
- Have a better understanding of the working of various political institutions including decentralized institutions state legislatures and parliament and relate this functioning to the greater cause of nation building as a responsible citizen.
- Assess how global national and regional development affect polity and society.
- To gain critical thinking and develop the ability to make logical inferences about socio-economic and political issues, on the basis of comparative and contemporary political discourses in India.
- Contemplate about national and international issues involving States having different political ideologies and historical contexts.
- Pursue higher education such as Post Graduate Studies and Research in Political Science and in other interdisciplinary areas to provide qualitative insights to create a better world.

Proposed Structure for Political Science Discipline

Semester I				
Course	**Paper**	**Credits**	**No. of Teaching Hours/Week**	**Total Marks/ Assessment**
Discipline Core-1	**Basic Concepts in Political Science**	**3**	**3**	**100 (60+40)**
Discipline Core--2	**Political Theory**	**3**	**3**	**100 (60+40)**
Open Elective-1	**Human Rights**	**3**	**3**	**100 (60+40)**
Semester II				
Discipline Core -3	**Western Political Thought**	**3**	**3**	**100 (60+40)**
Discipline Core -4	**Indian National Movement and Constitutional Development**	**3**	**3**	**100 (60+40)**
Open Elective—2	**Indian Polity: Issues and Concerns**	**3**	**3**	**100 (60+40)**
SEC	**Skill Enhancement courses**			

Semester I

BASIC CONCEPTS IN POLITICAL SCIENCE

DSC-1

Course Title: **BASIC CONCEPTS IN POLITICAL SCIENCE**	
Total Contact Hours: **45**	Course Credits: **3**
No. of Teaching Hours/Week:**3**	Duration of ESA/Exam: **3Hours**
Formative Assessment Marks: **40**	Summative Assessment Marks: **60+40=100**

Course Objective:

Develop an understanding about the nature and philosophy of Political Science and its interface with society. Enable the students to develop qualities of responsible and active citizens in a democracy.

Learning Outcome:

At the end of the course the students shall understand -

- Political Science, theoretically and will gain knowledge to explain and analyze politics at large.
- The dynamics of politics.
- To inculcate the democratic spirit.

Unit	**Contents of Course- 1**	**45 Hours**
Unit-I	**Chapter -1** Meaning of Politics, Nature, Scope and Importance of Political Science, Approaches to the study of Political Science, Emergence of the idea of Political Domain **Chapter- 2** Meaning, Definitions and Elements of State, Difference between State and Government, State and Society, State and Association, Theories of State- Idealist Theory, Liberal, Neo-Liberal Theory, Marxist and Gandhian Theory of Scope Nature Challenges State **Chapter-3** Civil Society- Meaning, Nature, Scope, Importance and Challenges.	**15 Hours**

Unit-II	**Chapter-4** Emergence, Meaning and Characteristics of Sovereignty **Chapter-5.Sovereignty:** Kinds theories -Monistic, Pluralistic, Challenges to the State Sovereignty in the age of Globalization **Chapter-6** .Law: Meaning, Source of Law and kinds.	**15 Hours**
Unit- III	**Chapter-7** Liberty: Meaning and Kinds; Positive and Negative **Chapter-8** Equality: Meaning and Kinds (Social, Economic and Political) **Chapter-9** Power and Justice: Meaning and kinds, Political Obligation: Meaning and nature	**15 Hours**

Exercise:

1. List out the modern elements of State
2. List out the countries and identify the issues related to equality
3. Identify an issue and discuss the role of civil society

Suggested Readings:

1. Political Theory: Ideas & Concepts, S. Ramswamy, Delhi,Macmillan, 2002.
2. Modern Political Theory, S. P. Verma, New Delhi, Vikas, 1983.
3. Principles of Modern, Political Science, JC Johri, Sterling Publishers Pvt. Ltd. 1995.
4. Principles of Political Science, AC Kapur, New Delhi, Sultan Chand and Sons, 2004.
5. Principles of Political Science, N.N Agarwal, Vidya Bhushan, Vishnoo Bhawan, R. Chand & Co, New Delhi, 1998.
6. Political Science Theory, S.C Pant, Prakashan Kendra, Lucknow, 1998.
7. Political Science Theory, S. N Dubey, Lakshmi Narain Agarwal, Agra, 2002.
8. Principle of Modern Political Science, J C Johari, Sterling Publications, New York, 2009.
9. Principles of Political Science, Anup Chand Kapur, S Chand & Co Ltd, 2010.

Pedagogy:

The course shall be taught through the Bridge Courses, Lecture, Tutorial, Interactive Sessions, Self-guided Learning Materials, Open Educational Recourses (OER) as reference materials, Practical Exercises, Assignments, Seminars, Group Discussions and Week-end Counseling Classes.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion/Field visit	10
Assessment Test-2	10
Assignment	10
Total	**40**

POLITICAL THEORY

DSC-2

Course Title: **POLITICAL THEORY**	
Total Contact Hours: **45**	Course Credits: **3**
No. of Teaching Hours/Week:**3**	Duration of ESA/Exam: **3Hours**
Formative Assessment Marks: **40**	Summative Assessment Marks: **60+40=100**

Course Outcome:

This course aims to introduce certain key aspects of conceptual analysis in political theory and the skills required to engage in debates surrounding the application of the concepts.

Learning Outcomes:

At the end of the course the students shall understand -

• The nature and relevance of Political Theory.

• The different concepts like Liberty, Equality, Justice and Rights.

• To reflect upon some of the important debates in Political Theory.

Unit	**Contents of Course- 2**	**45 Hours**
Unit-I	**Chapter-1** Meaning, Nature and Importance of Theory and Political Theory, Traditional Approaches to Political Theory- Normative, Historical, Philosophical, Institutional & Legal **Chapter-2** Modern Approaches- Behavioral, Post-Behavioral, David Easton's Political System and Marxian Approach **Chapter-3.Political Theory;** Decline and Resurgence Relevance	**15 Hours**
Unit-II	**Chapter-4** Liberalism: J.S Mill **Chapter-5** Neo- Liberalism: John Rawls **Chapter-6** Libertarianism: Robert Nozick	**15 Hours**

Unit- III	**Chapter-7:** Democracy: Evolution and Meaning; Theories- Classical, Elitist. Types: Direct Democracy- Meaning and Nature, Referendum, Initiative and Recall. **Chapter-8** Communitarianism and Multiculturalism: Evolution and Meaning. **Chapter-9** Secularism: Supporter: JawaharlalNehru and Rajiv Bhargav. Critique of Secularism: Ashish Nandy, T.N. Madan	**15 Hours**

Exercise:

- Write about the Myth and Reality on Communitarianism in India
- Compare the concept of Liberty, Equality and Justice to the Modern world
- Write the understanding of secularism in India

Suggested Readings:

1. Ahmed. V, Theory: Classes, Nations Literatures.: Verso, London, 1992.
2. Arendt. H., On Revolution, Viking, New York, 1963
3. Ashcroft. B, The Post-Colonial Studies Reader, Rout ledge London, 1995
4. Bryson. V, Feminist political Theory, Macmillan, London, 1992.
5. Christopher Butler. Postmodernism: A very Short Introduction, OUP Oxford, 2002.
6. Christopher Norris, The Truth about Postmodernism.: Wiley- Blackwell, New Jersey, 1993.
7. Connolly. W, Identity/Difference: Democratic Negotiations, Cornell University Press, NY, 1991.
8. Edward Said, Orientalism, Pantheon Books, New York, 1978.
9. Elshtain. J. B, Public Man, Private Man: women in Social and Political Thought, Princeton University Press, Princeton NJ, 1981.
10. Fanon. F. Black skin, white Masks, translated by C. L. Markham, Grove Press, New York, 1967.
11. Jean Francis Lyotard. The Postmodern Condition- A report on Knowledge. Parris: Minuit, 1979.
12. Balagangadhara, S.N., and Jakob De Roover, "The Secular State and "Religious Conflict: Liberal neutrality and the Indian Case of Pluralism". The Journal of Political Philosophy 15, no. 1: 67-92, 2007.

13. Bhargava, Rajeev. ed. Secularism and Its Critics, Oxford University Press, New Delhi, 1998.

14. Veena Das, Dipankar Gupta and Patricia. eds.. Tradition, Pluralism and Identity, Uberoi New Delhi, 1999.

15. Nehru, Jawaharlal. 1946. The Discovery of India. Jawaharlal Nehru Memorial Fund, Oxford University Press, New Delhi, 1988.

16. Rochana Bajpai, The conceptual vocabularies of secularism and minority rights in India, Journal of Political Ideologies, 2002.

17. ರಾಜಂ7ರಂ7ಮ ಹಿಗಡೆ ಹಾಮ ಸದಾನಂ೦ದ ಜೆ.ಎಸಂ³. (ಸಂ೦) "ಪಂYರಶವಂ7ವಲಿಕನ", ವಸಂ೦ತ್ ಪ್ರ
ಕಾ7ಶನ, ಬ೦ಗಳೂರು, *2016*

Pedagogy:

The course shall be taught through the Bridge Courses, Lecture, Tutorial, Interactive Sessions, Self-guided Learning Materials, Open Educational Recourses (OER) as reference materials, Practical Exercises, Assignments, Seminars, Group Discussions and Week-end Counseling

Classes.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

HUMAN RIGHTS

Open Elective OE-1

Course Title: **HUMAN RIGHTS**	
Total Contact Hours: **45**	Course Credits: **3**
No. of Teaching Hours/Week:**3**	Duration of ESA/Exam: **3Hours**
Formative Assessment Marks: **40**	Summative Assessment Marks: **60+40=100**

Course Objective:

This course aims to introduce the students to basic concepts and practices of Human Rights in the global and local domain. This course also exposes them to certain recent issues confronting the Human Rights debates.

Learning Outcomes:

After completing this course students will be able to-

- Explain the basic concept of Human Rights and its various formulations.
- Have necessary knowledge and skills for analyzing, interpreting, and applying the Human Rights standards and sensitize them to the issues.
- Develop ability to critically analyses Human Rights situations around them.

Unit	Contents of Course- OE-1	45 Hours
Unit-I	**Chapter-1** Meaning, nature, scope and Classification of Human Rights **Chapter-2** The Human Rights of First generation (Civil and Political Rights), Second generation (Economic, Social and Cultural Rights), Third generation (Collective Rights) and Fourth generation (Subjective Rights) **Chapter-3** Universal Declaration of Human Rights	**15 Hours**
Unit-II	**Chapter-4** Human Rights and Fundamental Rights, Fundamental Rights and Fundamental Duties in India **Chapter- 5** National Human Rights Commission (NHRC) – Composition, functions, performance and challenges **Chapter-6** Karnataka State Human Rights Commissions (KSHRCs) – Composition, functions, performance and challenges	**15 Hours**

Unit- III	**Chapter -7** National Commission and Committees for SCs/STs, Minorities' Commission, Women' Commission, therecomposition of functions. **Chapter-8** Major issues and concerns of Human Rights-Discrimination and violence against women, children, Dalits and Minorities, PwD and Transgender **Chapter-9** Challenges to Human Rights	**15 Hours**

Exercise:

- Group Discussion on Human Rights and its types (comparison of Western and Eastern concept of Human Rights).
- Students can be asked to do collage making and present the same.
- Find out the different types of complaints received by NHRC and bring out the end results on any one of such case.
- In order to make it more participatory learning, the students are required to visit the website of NHRC (www.nhrc.nic.in), wherein at the left-hand side, a link is provided to the 'instructions. After going through the guidelines issued by NHRC's, briefly explain the guidelines on – Custodial death/rape, Encounter death, and Guidelines on arrest.

Suggested Readings:

1. Baxi Upendra (ed.), The Right to be Human, Lancer International, Crawford, New Delhi, 1987.
2. James(ed.), The Rights of People, Oxford, New York, 1988.
3. Craston, M. What are Human Rights, Bodely Head, London, 1973
4. Rhonda L.Callaway& Julie Harrelson- Stephens,"International Human Rights", Published by viva books private limited, New Delhi, 2010.
5. Janusz Symonides,"Human Rights Concept and Standards", Rawat Publications, New Delhi , 2019.
6. Sunil Deshta and KiranDeshta,"Fundamental Human Rights", Deep and Deep Publications, New Delhi, 2011.
7. qÁ.PÀvÀÄeÁQë .vÀqÀ,ÀzÀ, "vÀiÁ£ÀvÀ ºÀPëïUÀ¼À ZÁjwæPÀzÀ±Àð£ ºÁUÀs AzÁPÁvÀUÀ¼ÀÄ", ¥Àæ,ÁgÁAUÀ, PÀ£Áðl PÀ «±Àé«zÁå®AiÀÄ, zsÁgÀvÁqÀ 2015.

8. Donelly, Jack and Rhoda Howard (ed.), International Handbook of Human Rights, Westport, Connecticut: Greenwood Press,1987.
9. Donelly, Jack, Universal Human Rights in Theory and Practice, New Delhi, Manas, 2005.
10. Dr.Tapan Biswal, "Human Rights Gender and Environment", Viva Books Private Limited Publishers, New Delhi 2006
11. Satya.P. Kanan, "Human Rights Evolution and Development", Wisdom Press, New Delhi 2012.
12. Gerwith, Human Rights: Essays on Justification and Application, University of Chicago Press, Chicago,1982.
13. Khan, Mumtaz Ali, Human Rights and the Dalits, Uppal Publishing House, New Delhi, 1995.
14. V.T.Patil,"Human Rights Developments in South Asia", Authors Press Publishers, Delhi 2003.
15. Dr.S.K. Gupta, "Statewise Comprehensive Information on Human Right Violation", Published by ALP Books, Delhi. 2009
16. Acharya, B.C. A Handbook of Wome;s Human Rights, Wisdom Press, New Delhi, 2011.
17. South Asia Human Rights Documentation Centre, Introducing Human Rights, Oxford, New Delhi, 2006.
18. Lillich, R. International Human Rights: Law Policy and Practice, Boston: Little Brown and Co., 1991 2nd Edn.
19. CdÄð£ïzÉÃvï, EA¢gÁCdÄð£ïzÉÃvï, ¸ÀÄ¥ÁÛzÁ¸ï ¸ÀA¥ÁzÀPÀgÀ,
C£ÀÄvÁzÀPÀgÀÄ PÉ. JZï. ²æÃ◌ÇvÁ¸ï, vÀiÁ£ÀvÀ º À¤ÄÌUÀ¼À: MAzÀDPÀgÀUÀ¢AxÀ,
£Áå¤À£ÀeÏ §ÄPï1æ¸ï◌, EArAiÀiÁ.

Pedagogy:

The course shall be taught through the Bridge Courses, Lecture, Tutorial, Interactive Sessions, Self-guided Learning Materials, Open Educational Recourses (OER) as reference materials, Practical Exercises, Assignments, Seminars, Group Discussions and Week-end Counseling Classes.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion/Field visit	10
Assessment Test-2	10
Assignment	10
Total	**40**

Semester II

WESTERN POLITICAL THOUGHT

DSC-3

Course Title: **WESTERN POLITICALTHOUGHT**	
Total Contact Hours: **45**	Course Credits: **3**
No. of Teaching Hours/Week:**3**	Duration of ESA/Exam: **3Hours**
Formative Assessment Marks: **40**	Summative Assessment Marks: **60+40=100**

Course Objective: The Syllabus is designed to understand Political Philosophy, traditions that evolved in Europe from Ancient to the beginning of modern era. To examine the contributions of the Greek, Medieval and early Modern thinker's Philosophical thought.

Learning Outcomes:

At the end of the course the students shall understand -

- And get an introduction to the Schools of Political Thought and Theory making in the West.
- And introduce the richness and variations in the political perceptions of Western Thinkers.
- And familiarize themselves to the Thought and Theory of Western Philosophy.

Unit	**Contents of Course-3**	**45 Hours**
Unit-I	**Chapter -1** Salient Features of the Greek Political Thought, **Plato:** State and Theory of Justice, Philosopher King, **Aristotle:** State and Its Classification, Theory of Revolution **Chapter -2** Salient Features of Medieval - Political Thought, Christian Tradition **Chapter -3 St. Thomas Aquinas:** Church v/s State, St**. Augustine:** Theory of Two Swords, **Machiavelli:** On Politics and State Craft, Views on ends and means	**15 Hours**
Unit-II	**Chapter -4 Thomas Hobbes**: Social contract Theory of Sovereignty, John **Locke**: Social Contract and Theory of Government, Tolerance; J .J **Rousseau**: Social Contract, General Will **Chapter -5Jeremy Bentham**: Theory of Utilitarianism **Chapter -6 J.S. Mill**: Views on Liberty	**15 Hours**

Unit- III	**Chapter -7 Hegel -** Dialectical Materialism, **Karl Marx -** Classless and stateless society **Chapter -8 Jurgen Habermas-** Communicative action, Public Sphere, Theory of truth and knowledge **Chapter -9 Hannah Arendt-** Theory of Action, Modernity, Conception of Citizenship.	**15 Hours**

Exercise:

- Compare Greek State with the Roman state and make points
- Imagine the present situation with that of Contractualist's Social Contract Theory and write the summary
- Can we have a classless society in the modern world? Comment

Suggested Readings:

1. A. Hacker, Political Theory: Philosophy, Ideology, Science New York, Macmillan, 1961.

2. G.H. Sabine. A History of Political Theory. New Delhi: Oxford and IBH, 1937.

3. C.L. Wayper. Political Thought. Bombay: B.I. Publications, 1977.

4. Ernest Barker, Greek Political Theory: Plato and his Predecessors. London: Metheun & Co., 1970.

5. M. Butterfield, The State Craft of Machiavelli, New York: The Macmillan Company, 1956.

6. O.P. Bakshi; Politics and Prejudice: Notes on Aristotle's Political Theory. Delhi: The Delhi University Press, 1975.

7. M.A. Shepard, "Sovereignty at the Crossroads: A Study of Bodin", Political Science Quarterly XLV, pp.580-603.

8. L. Colleti. From Rousseau to Lenin. New Delhi: Oxford University Press, 1969.

9. G.H. Sabine. A History of Political Theory. New Delhi: J.L. Thorson, Oxford and IBH, 1937.

10. C.E. Vanghan. The Political Writings of Jean Jacques Rousseau, 2 Vols. New York, Jojn Wiley, 1962.

11. C.L. Wayper, Political Thought. Bombay: B.I. Publication, 1977.

12. H. Warrender. The Political Philosophy of Hobbes: His Theory of Obligation, Oxford: Clarendon Press, 1957.

13. A. Hacker, Political Theory: Philosophy, Ideology Science. New York: Macmillan, 1961.

14. D. Boucher and P. Kelly, (eds) 'Political Thinkers: From Socrates to the Present', Oxford, Oxford University Press. 2009

15. J. Coleman, 'A History of Political Thought: From Ancient Greece to Early Christianity, Oxford, Blackwell Publishers, 2000.

16. Mukherjee, Subrato and Susheela Ramaswamy, 'History of political Thought: Plato to Marx', PHI Publishers, New Delhi, 2011.

17. A. Skoble and T. Machan, 'Political Philosophy: Essential Selections', New Delhi, Pearson Education, 2007.

Pedagogy:

The course shall be taught through the Bridge Courses, Lecture, Tutorial, Interactive Sessions, Self-guided Learning Materials, Open Educational Recourses (OER) as reference materials, Practical Exercises, Assignments, Seminars, Group Discussions and Week-end Counseling Classes.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

INDIAN NATIONAL MOVEMENT AND CONSTITUTIONAL DEVELOPMENT

DSC-4

Course Title: **INDIAN NATIONAL MOVEMENT AND CONSTITUTIONAL DEVELOPMENT**	
Total Contact Hours: **45**	Course Credits: **3**
No. of Teaching Hours/Week:**3**	Duration of ESA/Exam: **3 Hours**
Formative Assessment Marks: **40**	Summative Assessment Marks: **60+40=100**

Course Objective:

- To familiarize the students with the ideas of Nationalism and contemplate on how colonial rule was overthrown by the Indian Nationalists.
- To acquaint the students with the problems of Independent India.
- To enable the students to understand the role of India in World affairs and the contributions of great men towards freedom.

Learning Outcome:

At the end of the course the students shall -

- Understand how the colonial rule was overthrown by the Indian nationalists.
- Appreciate the ideals and values of Gandhi that resulted in freedom.
- Examine the problem of Independent India and the role played by great leaders in solving them.

Unit	Contents of Course-4	45 Hours
Unit-I	**Chapter-1** Indian National Movement: Features, The Liberal, The Extremist and Revolutionary Phase **Chapter-2** The Gandhian Phase: Non-Cooperation movement Civil Disobedience Movement and the Quit India movement. **Chapter-3** Constitutional Development: 1773 Regulation Act, 1833 charters Act, 1858- Queens proclamation	**15 Hours**

Unit-II	**Chapter-4** Morley-Minto Reform Act of 1909, Montague Chelmsford Act of 1919: main provisions and Dyarchy, The Nehru Report and Jinnah's 14-point Formula **Chapter-5** Government of India Act of 1935: main provisions of Round Table, Conference provincial Autonomy and federal system **Chapter-6** Indian Independence Act of 1947: main provisions, Cabinet Mission Plan	**15 Hours**
Unit- III	**Constituent Assembly Debates on** **Chapter-**7 State structure, citizenship Universal Adult Franchise **Chapter-8** Minority Rights, Uniform Civil Code **Chapter-9** Language and Union of States **(The above three should be discussed in the context of Constituent Assembly Debates)**	**15 Hours**

Exercise:

- Think over a situation in India and identify at least two political and socio-economic conditions that are present and two that are not present in Indian democracy
- List out in a table giving some democratic roles of a citizen, explore yourself how democratic you are.
- Write some good qualities required in a citizen

Suggested Readings

1. Bandopadhyay, S. From Plassey to Partition: A History of Modern India. New Delhi: Orient Longman, 2004.
2. Thapar, R. 'Interpretations of Colonial History: Colonial, Nationalist, Post-colonial', in DeSouza, P.R. (ed.) Contemporary India: Transitions. New Delhi: Sage Publications, 2000.
3. Sarkar, S. Modern India (1885-1847). New Delhi: Macmillan, 1983.
4. Jalal, A. and Bose, S. Modern South Asia: History, Culture, and Political Economy. New Delhi: Oxford University Press, 1997.
5. Smith, A.D. Nationalism. Cambridge: Polity Press, 2001.
6. Islam, S. 'The Origins of Indian Nationalism', in Religious Dimensions of Indian Nationalism. New Delhi: Media House, 2004.
7. Chatterjee, P. 'A Brief History of Subaltern Studies', in Chatterjee, Partha Empire & Nation: Essential Writings (1985-2005). New Delhi: Permanent Black, 2010.
8. Mani, B.R. Debrahmanising History, Dominance and Resistance in Indian Society. New Delhi: Manohar Publishers, 2005.

Pedagogy:

The course shall be taught through the Bridge Courses, Lecture, Tutorial, Interactive Sessions, Self-guided Learning Materials, Open Educational Recourses (OER) as reference materials, Practical Exercises, Assignments, Seminars, Group Discussions and Week-end Counseling Classes.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

INDIAN POLITY: ISSUES AND CONCERNS

Open Elective OE-2

Course Title: **INDIAN POLITY ISSUES**	
Total Contact Hours: **45**	Course Credits: **3**
No. of Teaching Hours/Week:**3**	Duration of ESA/Exam: **3Hours**
Formative Assessment Marks: **40**	Summative Assessment Marks: **60+40=100**

Course Objective: To make the students aware on different issues that exists in Indian polity. Through this paper students need to understand the emerging issues and their causes to the Indian Democracy.

Learning Outcome:

At the end of the course the students shall -

- Understand the reasons behind the causes of these issues and also the constitutional provisions that existed.
- Familiarize with the debates that emerged.
- Be able to suggest the measures to control such issues.

Unit	Contents of Course-OE-2	45 Hours
Unit-I	**Chapter-1 National Integration and Social Harmony** - Meaning and Need of National Integration and Suggestions for securing National Integration **Chapter-2 Society and Politics in India**: Caste and its Impact on Indian society and Polity **Chapter-3 Language**- Role and Constitutional Provisions, Issues	**15 Hours**

Unit-II	**Chapter-4 Religion and Local Traditions** - Role and Constitutional Provisions **Chapter-5 Development and Inclusiveness:** Issues and Concerns **Chapter-6 Regionalism** – Reasons for the Growth, Forms and Measures	**15 Hours**
Unit- III	**Chapter-7 Corruptions**- Causes and Measures **Chapter-8 Terrorism**- Types, Causes and Measures **Chapter-9** Celebrating Diversity – Consensus and Challenges	**15 Hours**

Exercise:

- Classify the major factors which are an impediment to National Integration and give your suggestions
- Identify the terrorist's group in the world
- Make a point on 2011 Anti- Corruption movement in India

Suggested Readings:

1. M. Galanter, 'The Long Half-Life of Reservations', in Z. Hasan, E. Sridharan and R. Sudarshan (eds.) India's Living Constitution: Ideas, Practices, Controversies, New Delhi: Permanent Black, 2002.

2. C. Jaffrelot, 'The Politics of the OBCs', in Seminar, Issue, 2005.

3. Singh, M.P. & Saxena, R. Indian Politics: Contemporary Issues and Concerns. New Delhi: PHI Learning, 2008.

4. Vanaik, A. & Bhargava, R. (eds.) Understanding Contemporary India: Critical Perspectives. New Delhi: Orient Blackswan, 2010.

5. Dunkin Jalaki "Bharatadalli Jativyavste ideye?", Malladahalli Publication, Malladahalli.

Pedagogy:

The course shall be taught through the Bridge Courses, Lecture, Tutorial, Interactive Sessions, Self-guided Learning Materials, Open Educational Recourses (OER) as reference materials, Practical Exercises, Assignments, Seminars, Group Discussions and Week-end Counseling Classes.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Assessment Test-1	10
Seminar/Presentation/Group Discussion	10
Assessment Test-2	10
Assignment	10
Total	**40**

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

BANGALORE UNIVERSITY
DEPARTMENT OF HISTORY

Proceedings of the Board of studies (History) (UG) held on 15th September 2021 at the Chambers of the Chairperson, Department of History, Bangalore University, Bengaluru at 11.00 A.M.

Members Present

1. Prof. Vijayalakshmi K.S Professor & Chairperson BOS (UG)	Chairperson	15/9/21
2. Prof. S Nagarathnamma Department of History, BUB	Member	
3. Prof. M. Kishora, Department of History, GFGCollege, Ramanagara	Member	
4. Prof. H.B. Ramesh Associate Professor Department of History GFGC, Channapatna-571501.	Member	
5. Prof. B M. Malini. Associate Professor Department of History Siddaganga First Grade College, Sondekoppa Road Nelamangala-562162.	Member	
6. Dr. Anuradha V Associate Professor Dept. of History Maharani Arts & Commerce College, Bengaluru.	(Co-Opted Member)	
7. Dr. Jnaneswari Associate Professor Govt Arts College Bengaluru	(Co-Opted Member)	

Member Absent (Internal)

1. Prof. K. Narayanappa.
2. Prof. V. Vijayakumar
3. Prof. S.A. Lakshmi Devi
4. Prof. M. Govinda Shetty

Member Absent (External)

I. Prof. C. R. Govindaraju. Professor
Department of History
Kannada University Hampi

2. Dr. L.P. Raju. Professor, Department of History Tumkur University Tumkur-572103.

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

The Chairperson welcomed the members and introduced the agenda…

A Meeting of the Board of Studies (UG) was held to approve NEP History Curriculum. Eight (8) papers for 1st and 2nd semester BA History were approved based on the model curriculum drafted by the NEP State Committee. Few modifications were made and the BOS recommended that in place of the paper entitled 'Manuscriptology', the paper entitled "History of Trade and Commerce in India" would replace as open elective for the Second semester BA.

The meeting came to close at 5.00 pm with the Chairperson extending thanks to all the members.

CHAIRPERSON 17/9/25

BOS in History (UG)-2021-22

PROFESSOR AND CHAIRPERS
Department of History
Bangalore University
Jnanabharathi Campus,
Bangalore - 560 056.

Bangalore University

Department of History

Jnanabharathi Campus Bengaluru – 560 056

Syllabus for

I & II Semester History Papers
Under-Graduate (UG) Program

Framed according to the National Education Policy (NEP 2020)

September 17, 2021

Bangalore University
Department of History
Jnanabharathi Campus
Bengaluru – 560 056

BOS Approved Syllabus for UG Programme

(NEP – 2020)

Syllabus for I & II Semester B.A. History Papers

Effective from Academic year 2021-22

September 17, 2021

INTRODUCTION

The NEP-2020 offers an opportunity to effect a paradigm shift from a teacher-centric to a student-centric higher education system in India. It is based on Outcome Based Education, where the Graduate Attributes are first kept in mind to reverse-design the Programs, Courses and Supplementary activities to attain the graduate attributes and learning outcomes. The learning outcomes-based curriculum framework for a degree in B.A.(Honours) History is intended to provide a comprehensive foundation to the subject and to help students develop the ability to successfully continue with further studies and research in the subject while they are equipped with required skills at various stages. The framework is designed to equip students with valuable cognitive abilities and skills so that they are successful in meeting diverse needs of professional careers in a developing and knowledge-based society. The curriculum framework takes into account the need to maintain globally competitive standards of achievement in terms of the knowledge and skills in History

The ever expanding boundaries of History necessitates the understanding of the various aspects of human life. The challenges of Globalisation makes it imperative for the History discipline to go beyond the regional, national and even international frontiers of knowledge. The curriculum aims to equip the students to understand historical processes properly and situate the significance of historical changes that take place within a society or culture, examine the patterns of such transitions and also assess the patterns of continuity. The course provides an understanding of historical concepts, perspectives and methodology. It would be an endeavour in promoting critical thinking, research and analysis.

Students pursuing B.A. History will be encouraged to be a part of interactive sessions, discussions and debates. The curriculum would make the young minds more receptive, as well as inquisitive with a scientific bent of mind. Critical thinking, analytical interpretation and drawing conclusions from data will be the focus of the learning outcomes.

Graduate attributes in History

On completion of the course, students are expected to have acquired the skills of Critical thinking, rational enquiry, and exploring the relationship between the past and the present. The attributes expected from Graduates of the B.A. History course are:

- Knowledge of our History and Heritage
- Familiarity with the process of development in other parts of the world
- Identify patterns of change and continuity with regards to issues of contemporary significance
- Develop a respect for our Heritage and culture and understand the strength of Diversity of our country
- Ethical awareness / reasoning
- Social Justice
- National and international perspective
- Lifelong learning

A Certificate, Diploma, Bachelor Degree or Bachelor Degree with Honours in History is awarded at the end of each year of exit of the Four-year Multi-Disciplinary Undergraduate Programme:

CONTINUOUS INTERNAL EVALUATION AND SEMESTER END EXAMINATION

Total marks for each course shall be based on continuous assessments and term end examination. As per the decision of the Karnataka State Higher Education Council, it is necessary to have uniform pattern of 40: 60 for CIA and Semester End examinations respectively, among all the Universities, their affiliated and autonomous colleges.

Question Paper pattern and Scheme of Examination is as follows:

BA Semester Scheme Time: 2 hrs DISCIPLINE CORE Max. Marks: 60			
Sections	**Question Paper pattern/ Theory Part Semester End Examination**	**Marks**	**Total Marks**
A	Locate places on the Map and Explain historical significance in two Sentences. Or Marking Extent or Borders of the kingdom and write a brief note about the Kingdom	5+5	10
For Blind students only *Instead of map question one medium answer question. *Blind students not answering the map question should enclose a copy of the certificate of blindness issued by the competent authority			
B	Answer any **One** Out of **Three** Questions	1x15	15
C	Answer any **Two** Out of **Four** Questions	2x10	20
D	Answer any **Three** Out of **Five** Questions	3x5	15
Grand Total Marks			**60**

BA Semester Scheme Time: 2 hrs Paper: Open Elective Max. Marks: 60			
Sections	**Question Paper pattern/ Theory Part Semester End Examination**	**Marks**	**Total Marks**
A	Answer all **Five** Questions	5x 3	15
B	Answer any **Three** Out of **Five** Questions	3x10	30
C	Answer any **Three** Out of **Five** Questions	3x5	15
Grand Total Marks			**60**

BA

BA Semester 1

DISCIPLINE CORE -1

DSC 1 : Political History of Karnataka (BCE-300 to CE 1000) Part-I

Course Outcomes (COs):

At the end of the course the student should be able to:

- Understand the continuity of Political developments and strategies.
- Analyse the importance of causes for the rise of regional political dynasties.
- Understand contextual necessities which influenced the era of political supremacy.
- Understand and describe the contemporary political history.
- Appreciate the confluence of diverse political elements.

DSC-1	Number of Theory Credits	Number of lecture hours/semester
Political History of Karnataka (BCE-300 to CE 1000) Part-I	**3**	**42**

Content of Course 1	42 Hrs
Unit – 1 Introduction	**14**
Chapter No. 1 Survey of sources- Pre historic culture	04
Chapter No. 2 **FORMATION OF STATE** Kingship – Duties and Functions of King and his Ministers- Sapthanga theory.	06
Chapter No. 3 Rituals and sacrifices Coronation ceremony-Rajasuya-Vajapeya.	04
Unit – 2 **Early Beginnings:**	**14**
Chapter-4. The Mauryas /The Satavahanas /Kadambas of Banavasi-	04
Chapter No. 5. The Gangas of Talakad - Durvineetha -The Nolambas	04
:**Chapter No. 6 Age of Empires** The Rastrakutas – Amoghavarsha Nrupatunga -Chalukyas of Badami – Pulikesin – II	06
Unit – 3 Kingdoms of Kalyana	**14**
Chapter No. 7 – Chalukyas of Kalyana-Tailapa-Vikramadithya-VI -Someshwara-III(CE-1076-1126)	05
Chapter No. 8 Kalachuris of Kalyana-Bijjala-II.	05
Chapter No. 9. Central And Provincial Administration from Gangas of Talakadu to Kalachuris of Kalyana	04

Books for Reference

1. K.R Basavaraja - "History and Culture of Karnataka"
2. R.S Mugali - "Climpses of Karnataka"
3. P.B. Desai - "A History of Karnataka"
4. H.V Shrinivasa Murthy and R. Ramakrishnan - " A Concise History of Karnataka"
5. A. Sundara (Ed) - "Karnataka Charitre" Volume I
6. B. Surendra Rao (Ed.) - "Karnataka Charitre" Volume II
7. R.R Diwakar - " Karnataka Through the Ages"
8. M. Chidananda Murthy - "Karnataka Shasanagala Samskrutika Adhyayana"
9. S. Settar - "Halagannada – Lipi, Lipikara, Lipi Vyavasaya"
10. A.C Nagesh - " Pracheena Karnataka Charithre

Pedagogy:

Lecture Method – Class Room Teaching
Learning Through Project work
Visit to historical sites

Assessment:

Weightage for assessments (in percentage)

Formative Assessment		
	Internal Assessment	**Theory Part Semester End Examination**
Internal Test	20	60
Assignments/Map study	10	
Viva Voice	10	
Total	**40**	
Grand Total		**100**

BA

Semester 1

DISCIPLINE CORE -2

DSC 2: Cultural Heritage of India

Course Outcomes (COs):

At the end of the course the student should be able to:

- Provide an insight into the extensive heritage of India
- Familiarize Indian history and culture
- Analyse the factors responsible for origin and decline of culture
- Provide the opportunity to understand the process of cultural development

DSC-2	Number of Theory Credits	Number of lecture hours/semester
Cultural Heritage of India	**3**	**42**

Content of Course 2	42 Hrs
Unit – 1 Introduction	**14**
Chapter No. 1 Meaning, Definition Historical Cultural Heritage-Concepts, Characteristics-types of Indian Cultural Heritage: Tangible, intangible, Oral and Living traditions.	04
Chapter No. 2 Significance of fairs and festivals. religious rituals: Regional, Folk, Tribal, National - Monsoon fairs- Animal Fairs	05
Chapter No. 3 Pilgrimage centres of India- Kashi, Ujjaini,Rameswara, Mount Abu Ajmer, Shravanabelagola, Bande Navaz Darga, Amritsar, Goa, Velangani.	05
Unit – 2 Legends, Narratives and Cultural Ethos	**14**
Chapter No. 4. Meaning, significance, forms and tradition of legends-Puranik Legends - Ramayana and Mahabharata - Panchtantra, Jataka.	06
Chapter No. 5. Traditional Performing Arts - Bharat Natya Shastra: The Source of Performing Indian Classical Arts;	03
Chapter No. 6. Indian Classical Music - Dances as Cultural Heritage. Oral Tradition and performing Arts Carnatic Music and Hindustani Music – India Theatre	05
Unit – 3 Architecture and Built Heritage	**14**
Chapter No. 7. Meaning and Definition – Caves as Built Heritage	05
Chapter No. 8. Important Monuments of India: Sarnath, Aihole, Badami, Pattadakal, Ajanta,Ellora, Sanchi, Shore Temple (Mahabalipuram), Jaganatha Temple –Puri, Konark Sun Temple, Khajuraho, Taj Mahal, Red Fort .	03
Chapter No. 9. Mapping Places of Historical Importance: Delhi, Agra, Nalanda, Saranath, Sanchi, Hampi, Badami, Mahabalipuram, Ajantha, Ellora, Prayaga, Varanasi, Ramaeshwaram, Dwaraka, Konark, Khajuraho, Hampi, Madurai, Shravanabelagola, Thanjavur.	06

Books for Reference

1. S. Radhakrishnan - "Culture of India"
2. K.T Achaya - Indian food: A Historical Companion,
3. Banga, I. (Ed) - The City in Indian History : Urban Demography, Society and Politics.
4. A.L Basham - The Wonder that was India.
5. Sachin Shekhar Biswas - Protecting the Cultural Heritage
6. N.K Bose - "Culture Zones of India" in culture and Society in India.
7. S.Narayan - Indian Classical Dances.
8. Gokulsing, K. Moti - Popular Culture in a Globalized India,
9. Bhanu Shankar Mehta - Ramlila Varied Respective
10. Rangacharya - The Natya shastra, English translation with critical.

Pedagogy:

Lecture Method – Class Room Teaching
Learning Through Project work
Visit to historical sites

Assessment:

Weightage for assessments (in percentage)

Formative Assessment		
	Internal Assessment	**Theory Part Semester End Examination**
Internal Test	20	60
Assignments/Map study	10	
Viva Voice	10	
Total	**40**	
Grand Total		**100**

BA
Semester 1
Open Elective 1

OP-1: Society and Culture of Karnataka (CE 300 to CE 1000) Part-I

Course Outcomes (COs):

At the end of the course the student should be able to:

- Provide an insight about the Society and Cultural development of Karnataka.
- Familiarize Karnataka history and culture.
- Analyze the factors responsible for origin and decline of dynasties.
- Provide the opportunity to understand the process of cultural diversities.

Open Elective 1	Number of Theory Credits	Number of lecture hours/semester
Society and Culture of Karnataka (CE 300-CE 1000) Part-I	**3**	**42**

Content of Course 1	42 Hrs
Unit – 1 Introduction	**14**
Chapter No. 1 Antiquity of Karnataka Language and Script – Inscription and Development of Literature	03
Chapter No. 2 Agriculture and Land Grants	05
Chapter No. 3 Education and Emergence of Agraharas	06
Unit – 2 Social Conditions	**14**
Chapter No. 4. Society – Family and Customs – Marriage system – Food habits	05
Chapter No. 5. Religion – Traditions and Rituals	05
Chapter No. 6. Festivities – Dasara, Karaga, Mahamasthaka Abisheka; Pilgrimages – Male Madeswara, Kodalasangama, Bande Navaz Urs	04
Unit – 3 Religious Traditions	**14**
Chapter No. 7. Pilgrim Circuits of Jainism and Buddhism	04
Chapter No. 8. Hinduism – Cults: Shaiva- Vaishnava- Bhagavatha	05
Chapter No. 9 Art and Architecture – Fine arts and Performing Arts	05

Books for Reference

1. S. Settar - "Halagannada – Lipi, Lipikara, Lipi Vyavasaya"
2. K.R Basavaraja - "History and Culture of Karnataka"
3. R. Rajanna & A.C Nagesh - "Karnatakada Charithre" Volume I
4. P.B. Desai - "A History of Karnataka"
5. A. Sundara (Ed) - "Karnataka Charitre" Volume I
6. B. Surendra Rao (Ed.) - "Karnataka Charitre" Volume II

7. S. Settar - " Halagannada; Bhashe, Bhasha Vikasa, Bhasha Bandhavya"
8. M. Chidananda Murthy - "Karnataka Shasanagala Samskrutika Adhyayana"
9. S. Rajashekara - " Karnataka Architecture"
10. K.A. Nilakanta Sastri - "A History of South India"

Pedagogy:

Lecture Method – Class Room Teaching
Learning Through Project work
Visit to historical sites

Assessment:

Weightage for assessments (in percentage)

Formative Assessment		
	Internal Assessment	**Theory Part Semester End Examination**
Internal Test	20	60
Assignments/Map study	10	
Viva Voice	10	
Total	**40**	
Grand Total		**100**

BA
Semester 1
Open Elective-1

OE- 1: Introduction to Archaeology

Course Outcomes (COs):

At the end of the course the student should be able to:

- Understand the concept of Archaeology as an ancillary for study of history
- Familiarize the students about scope of Archaeology.
- Understand the various tools and techniques in Archaeology

Open Elective-1	Number of Theory Credits	Number of lecture hours/semester
Introduction to Archaeology	**3**	**42**

Content of Course 1	42 Hrs
Unit – 1 Introduction	**13/14**
Chapter No. 1 Definition – Scope - Nature	03
Chapter No. 2 Concepts – Artifacts – Assemblage – Industry – Culture -Layer	05
Chapter No. 3 Kinds of Archaeology – Ethno, Marine and Salvage	06
Unit – 2 Archaeology by Period	**14**
Chapter No. 4. Lower Paleolithic – Middle Paleolithic – Upper Paleolithic Mesolithic – Chalcolithic – Bronze age – Iron Age	05
Chapter No. 5. Development in the Global Context – From Antiquarians to Scientific Archaeology – Flinders Petrie- Pitt Rivers – Leonard Wooly.	05
Chapter No. 6. Archaeology in India – William Jones to Wheeler – The Allchins – S.R. Rao – Archaeological Survey of India – Department of Archaeology Government of Karnataka	04
Unit – 3 Exploration, Excavation and Analysis	**14**
Chapter No. 7 Identification of a site – field survey – sampling techniques – Application of scientific methods.	05
Chapter No. 8. Methods of Excavation – vertical and horizontal – Trenching – Gridding	05
Chapter No. 9 Excavation of burial mounds – Open Stripping – Quadrant method – Excavation of pits – Excavation of a typical site	04

Books for Reference

1. Agrawal D.P - Archaeology in India
2. Aiken M.J - Science based dating in archaeology
3. Allchin Bridget And Raymond Allchin - Rise of Civilization in India and Pakistan
4. Atkinson RJC - Field Archaeology
5. Basker .P - Techniques of Archaeological Excavation
6. Chakrabarthi D.K - A History of Indian Archaeology from the beginning to 1947
7. Chakrabarthi D.K - Theoretical Perspectives in Indian Archaeology
8. Gosha .A - Encyclopaedia of Indian Archaeology
9. Rajan .K - Archaeology, Principles and Methods
10. Raman K.V - Principles and Methods in Archaeology

Pedagogy:

Lecture Method – Class Room Teaching
Visit to Archaeological sites
Learn techniques of excavations
Collaborative learning strategies
Learning about digging, Trenching and Exploration
Collection and Preservation of Artifacts

Assessment:

Weightage for assessments (in percentage)

Formative Assessment		
	Internal Assessment	**Theory Part Semester End Examination**
Internal Test	20	60
Assignments/Map study	10	
Viva Voice	10	
Total	**40**	
Grand Total		**100**

BA
Semester 2
Discipline Core-3

DSC-3: Political History of Karnataka (CE1000-CE 1750) Part-II

Course Outcomes (COs):

At the end of the course the student should be able to:

- Understand the rise and fall of Political dynasties in Karnataka.
- Familiarize with the patterns of administration.
- Analyze the traditional values and ethos of political development.
- Understand the rise and fall of regional variations.
- Study the complexities involved in polity of the time.

DSC-3	Number of Theory Credits	Number of lecture hours/semester
Political History of Karnataka (CE1000-CE 1750) Part-II	**3**	**42**

Content of Course 1	42 Hrs
Unit – 1 Introduction	**14**
Chapter No. 1 The Hoysalas	05
Chapter No. 2 The Yadavas of Devagiri	05
Chapter No. 3 The Seunas	04
Unit – 2 Medieval Karnataka	**14**
Chapter No. 4. Vijayanagar – Dynasties - Bahamani States	06
Chapter No. 5. Nayankara system – Keladi Shivappa Nayaka – Shistu	05
Chapter No. 6. Maratha Rule in Karnataka – Shahaji – Shivaji	03
Unit – 3 Post Vijayanagar	**14**
Chapter No. 7 Wodeyars of Mysore – Nayakas of Chitradurga **–** Nayakas of Keladi	05
Chapter No. 8. Minor Chieftains – Yalahanka Nada Prabhus – Sonda Nayakas	04
Chapter No. 9 Administration from Hoysalas to post Vijayanagar period	05

Books for Reference

1. K.R Basavaraja - "History and Culture of Karnataka"
2. P.B. Desai - "A History of Karnataka"
3. Burton Stein - " Vijayanagara"
4. B. Sheik Ali(Ed.) - "Karnataka Samagra Charitre" Volume IV.
5. B. Vivek Rai (Ed.) - "Pravasi Kanda Vijayanagara"

6. G. Yazdani - "History of the Deccan"
7. K. Satyanarayana - "History of the Wodeyars of Mysore"
8. Mohibul Hasan - "History of Tipu Sulthan"
9. T.V Mahalingam - " Administration and Social Life Under Vijayanagara"
10. K.V Ramesh - "History of South Kenara "

Pedagogy:

Lecture Method – Class Room Teaching

Learning through Project work

Visit to Historical sites

Collaborative learning strategies

Assessment:

Weightage for assessments (in percentage)

Formative Assessment		
	Internal Assessment	**Theory Part Semester End Examination**
Internal Test	20	60
Assignments/Map study	10	
Viva Voice	10	
Total	**40**	
Grand Total		**100**

BA
Semester 2
DISCIPLINE CORE 4

DSC 4: Cultural Heritage of Karnataka

Course Outcomes (COs):

At the end of the course the student should be able to:

- Understand the concept of cultural heritage of Karnataka
- Study various cultural factors which influence the flow of culture
- Analyze the factors responsible for formation of pluralistic society
- Understand the concept "Unity in diversity".

DSC 4	Number of Theory Credits	Number of lecture hours/semester
Cultural Heritage of Karnataka	**3**	**42**

Content of Course 1	42 Hrs
Unit – 1 Karnataka's Cultural Heritage : An Introduction	**14**
Chapter No. 1 Meaning, Definition and Historical background of cultural Heritage	05
Chapter No. 2 Characteristics of Karnataka Heritage	05
Chapter No. 3 Significance of cultural Heritage	04
Unit – 2 Fairs, Festivals and Rituals	**14**
Chapter No. 4. Historical background of Fairs, Festivals and Rituals and their importance in Karnataka culture	05
Chapter No. 5. Fairs of Karnataka – Types of Fairs – Temple fairs (Utsava) Folk Fairs, Urs, Karaga, Kaveri Sankaramana, Kambali- Jallikatu	04
Chapter No. 6. Festivals of Karnataka – Religious festivals- Ugadi, Ganesha Chaturthi- Dasara- Deepavali , Huttari, Pongal, Muharam, Id-ul-Fitr (Ramzan) Idul-Zuha (Bakrid), and Christmas	05
Unit – 3 Traditional Art and Architecture and cultural Ethos	**14**
Chapter No. 7 Meaning of Art and Architecture – Forms of Dance	05
Chapter No. 8. Forms of Music	04
Chapter No. 9 Architecture and Built Heritage	05

Books for Reference

1. K.T Achaya - Indian Food : A Historical Companion
2. Sachin Shekhar Biswas - Protecting the Cultural Heritage
3. N.K Bose - Culture Zones of India in culture and Society in India.
4. S. Narayan - Indian Classical Dances
5. Prakash, H.S Shiva - Traditional Theatres

6. Krishna N. Reddy - Cultural Heritage of South India
7. Dr. A. Murageppa - Dakshin Bhartiya Jaanpad Kosh. Vol-I II
8. Dr. Surynath Kamat - Karnataka Sankshipt Itihas
9. Shrinivas T - Bhartiya Itihas Mattu Parampare
10. K.R. Basavaraj - Karnataka History and Culture

Pedagogy:

Lecture Method – Class Room Teaching
Visit to Heritage sites
Learning through Project work
Collaborative learning strategies
Learning through Group Discussion
Visit to sites

Assessment:

Weightage for assessments (in percentage)

Formative Assessment		
	Internal Assessment	**Theory Part Semester End Examination**
Internal Test	20	60
Assignments/Map study	10	
Viva Voice	10	
Total	**40**	
Grand Total		**100**

BA
Semester 2
Open Elective 2

OE-2: Society and Culture of Karnataka (CE 1000 to CE 1750) Part-II

Course Outcomes (COs):

At the end of the course the student should be able to:

- Understand the concept of cultural heritage of Karnataka
- Study various cultural factors which influence the flow of culture
- Analyze the factors responsible for formation of pluralistic society
- Understand the concept "Unity in diversity".

OE-2	Number of Theory Credits	Number of lecture hours/semester
Society and Culture of Karnataka (CE 1000 to CE 1750) Part-II	**3**	**42**

Content of Course 1	42 Hrs
Unit – 1 Introduction	**14**
Chapter No. 1 Vachana Movement – Anubhava Mantappa	05
Chapter No. 2 Bhakti Movement of Karnataka – Dasa Movement	04
Chapter No. 3 Sufism and Christian missionaries in Karnataka	05
Unit – 2 Society and Economy	**14**
Chapter No. 4. Social Conditions – Caste System – Rituals and Customs	05
Chapter No. 5. Economic Conditions – Agriculture	04
Chapter No. 6. Indigenous Industries - Trade and Commerce	05
Unit – 3 Art and Architecture	**14**
Chapter No. 7 Temple Architecture **–** Islamic Architecture	05
Chapter No. 8. Church Architecture	04
Chapter No. 9 Painting	05

Books for Reference

1. P.B Desai - History of Karnataka
2. K.R Basavaraja - History and Culture of Karnataka
3. B.R Hiremath - Karnataka Shasanagalalli Vartakaru
4. Rahamat Tarikere - Karnataka Sufigalu
5. Rajaram Hegde & M.V Vasu - Dakshina Karnataka Arasu Manethangalu
6. R.R Diwakar - Karnatka Through the Ages

7. Suryanath U. Kamath - A History of Karnataka
8. H.K Sherwani - The Bahamani's of the Deccan
9. Dept. of Archaeology - Vijayanagar Adhayayana
10. Baragur Ramachandrappa - Karnataka Sangathi

Pedagogy:

Lecture Method – Class Room Teaching
Visit to historical sites
Group Discussion
Visit to cultural sites
Preparation of charts

Assessment:

Weightage for assessments (in percentage)

Formative Assessment		
	Internal Assessment	**Theory Part Semester End Examination**
Internal Test	20	60
Assignments/Map study	10	
Viva Voice	10	
Total	**40**	
Grand Total		**100**

BA
Semester 2
Open Elective-2

OE 2: Trade and Commerce of India from the Earliest to CE 1947

Course Outcomes (COs):

At the end of the course the student should be able to:

- Understand the concept of Trade and Commerce of India from the Earliest to 1947
- Study India's trade contacts with early civilizations
- Familiarize India's maritime trade with eastern world the factors which influenced in influencing culture and society
- Understand the taxation and coinage of Mughals
- Analyse the concept "Drain of Wealth".

OE 2	Number of Theory Credits	Number of lecture hours/semester
Trade and Commerce of India from the Earliest to CE 1947.	**3**	**42**

Content of Course 1	42 Hrs
Unit – 1 Trade and commerce of Ancient India	**14**
Chapter No. 1 Sources – India's trade with Early Civilizations – Indus valley and Greco – Roman trade, Trade routes (Silk route of China)	05
Chapter No. 2 Overseas trade during Mauryan and Gupta period- Kushanas and South Indian contacts	05
Chapter No. 3 Trade Guilds and Merchant Association - Aiyyavalepura	04
Unit – 2 Trade and commerce of Medieval India	**14**
Chapter No. 4. Arab trade with India	04
Chapter No. 5. Maritime trade with Eastern world	05
Chapter No. 6. Mughal Period- Coinage Toll and Taxation	05
Unit – 3 Trade and commerce of Modern India	**14**
Chapter No. 7 European trading companies	03
Chapter No. 8. Mercantilism – Agency Houses – Banking and Currency	06
Chapter No. 9 Transport and trade – Drain of wealth	05

Books for Reference

1. B.H. Saletore, Karnataka's Trans-Oceanic Contacts.
2. Syed Sulaiman Nadvi, Relations between Arabs and India.
3. K. K Mukherjee, Early Indian Contacts.
4. J. Kenndy, The Early Commerce of Babylon with India.
5. Shamasastri (trans.) Kautilya's Arthasastra
6. O.P. Singh-Surat and Silk Trade in the second half k of 17th Century.
7. P. Anderson- The English in western India.
8. S.A. Khan- The East India trade in 17th Century.
9. Basu Dev Chatterje – Trade Tariff and Empire.
10. Asiya Siddique (ed)- Trade and Finance in Cola vial India 1750-1860
11. K.N. Chaudari (ed)- The economic development of India under the East India Company 1814-1858

Pedagogy:

Lecture Method – Class Room Teaching
Learning to project work
Group Discussion and Preparation of charts
Use of Learning Resources like

Audio – Visual aids
Documentaries
Films

Assessment:

Weightage for assessments (in percentage)

Formative Assessment		
	Internal Assessment	**Theory Part Semester End Examination**
Internal Test	20	60
Assignments/Map study	10	
Viva Voice	10	
Total	**40**	
Grand Total		**100**

COURSE PATTERN AND SCHEME OF EXAMINATION FOR UNDER-GRADUATE (UG) PROGRAM
HISTORY NEP SYLLABUS- LIST OF PAPER FOR I TO II SEMESTERS

SEM	Paper	Title of Paper	No. of Teaching Hours	Hours/Week Theory	Examination Pattern Max & Min. Marks/Paper		Total Marks/ Paper	Credits
					Theory			
					Written Test	IA		
I	DSC -l	Political history of Karnataka (BCE-300 to 1000 CE) Part-I	42	4	60	40	100	3
	DSC -2	Cultural Heritage of India	42	4	60	40	100	3
	OE-I	Society and Culture of Karnataka (CE 300 to CE 1000) Part-I OR Introduction to Archaeology	42	4	60	40	100	3
II	DSC -3	Political History of Karnataka (CE1000- CE 1750) Part-II	42	4	60	40	100	3
	DSC -4	Cultural Heritage of Karnataka	42	4	60	40	100	3
	OE-2	Society and Culture of Karnataka (CE 1000 to CE 1750) Part-II OR Trade and Commerce of India from the Earliest to CE 1947.	42	4	60	40	100	3

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

SURANA COLLEGE
AUTONOMOUS

#16, SOUTH END ROAD, BASAVANAGUDI, BANGALORE

RE- ACCREDITED WITH "A+" GRADE

Bangalore University BOS
Approved Syllabus for I semester
Psychology papers

For Under Graduation (UG)
Program Framed according to
the National Education Policy
(NEP 2020)

For B.A PSYCHOLOGY

SYLLABUS 2021-22

(Basic/ Honors)
(Implemented from the Academic year 2021-22)

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

Undergraduate program in Psychology

NEP 2020

Preamble

NEP has given rise to a novel dimension in fine tuning and accelerating the learning process of a student. Keeping this in mind emergence of LOCF (Learning Outcome-based Framework) has taken place.

Psychology as a science/social science tries to understand the behaviour of an individual in different situations making the learner to get equipped with various abilities to lead life with refined knowledge and talent as well as making it more student centric.

In the present context the syllabi of Psychology (BA/BSc) is framed in such a way to gain fundamental and advanced knowledge of psychology along with enhanced skills. Further, preparing the students to get ready to meet the needs of job market.

The curriculum committee framed by the Government of Karnataka includes: 1. Dr. G. Venkatesh Kumar, Professor, University of Mysuru, Mysuru 2. Dr. Vijayalakshmi A . Aminabhavi, Professor, Karnatak University, Dharwad 3. Dr. Lancy D'Souza, Associate Professor, Maharaja's College, Mysuru 4. Dr. M. Sreenivas, Associate Professor, Bangalore University, Bengaluru 5. Dr. Kamala H, Associate Professor, Maharani Cluster University, Bengaluru 6. Dr. Beena Daliya, Associate Professor, IIPR, Bengaluru

At the outset the proposed CBCS scheme for the Four years Multidisciplinary Undergraduate Honours Programme / 5 years Integrated Master's Programme covers major and minor disciplines in Psychology, Open Electives, skill development in the 1st and 2nd semesters with Ability Enhancement. (Completion of one year course - a student is eligible for a "Certificate" in Psychology with 48 credits).

The concept of Psychology in the 1st and 2nd semesters throw light on basic information about psychology making the beneficiary to acquire and develop the knowledge about psychology interms of biological base of behaviour, sensation, attention, perception, memory, learning, decision making, emotions, motivation, intelligence, thinking and reasoning as well as personality along with experiments.

In the second year which comprises of 3rd and 4th semesters cover the aspects related to Child Psychology and Developmental Psychology as major and minor disciplines along with Ability Enhancement, Skill Enhancement Course and Extracurricular activities. (Completion of two years course - a student is eligible for a "Diploma" in Psychology with 96 credits).

Once the student enters 3rd year of learning psychology under BA/BSc stream in the 5th semester student can select one of major disciplines under Social Psychology, Organizational Psychology, and Corporate Psychology. Under minor disciplines choice is given between Social Psychology and Organizational Psychology.

In the 6th semester, major disciplines include Abnormal Psychology, Health Psychology and minor disciplines has options between Organizational Psychology Abnormal Psychology, Health Psychology and Corporate Psychology followed by Skill Enhancement Paper. (Completion of three years course - a student is eligible for a "Graduation Certificate" in Psychology with 136 credits).

Fourth year of NEP includes students of only major discipline. 7th semester of Fourth year includes Bio Psychology, Cognitive Psychology, Child Guidance and Counselling and Research Methodology with discipline specific electives comprising Child Pathology,

8th semester has a major discipline on Theories of Personality and Learning as well as Theories of Motivation and Emotion, Counselling and Guidance. Discipline specific elective course has Forensic Psychology and Research Project Work. (Completion of four years course - a student is eligible for a "Honours Degree Certificate" in Psychology with 176 credits).

It should be kept in mind that, the practical in every semester is related to the theory paper that a student learns.

NEP Syllabi of Psychology (Discipline Specific Course) subject for BA/BSc- I Semester

With effect from academic year 2021-22 and onwards

PAPER – I: FOUNDATIONS OF PSYCHOLOGY – I

Learning Outcomes:

1. Students will understand the genesis of Psychology and its importance 2.
Students will gain basic knowledge about Psychology
3. Students will understand the fundamental mental processes which are base for behaviour
4. Students understand the Applications of Psychology in various fields *

Teaching Hours 4 hours per week

* 70 marks for examination and 30 marks for Internal Assessment

NIT – I: GENESIS AND GOALS OF PSYCHOLOGY (10 hours) • Psychology: Emergence and Development; Definition and Goals of Psychology Understanding, Describing, Predicting and Control of Behaviour.

- Key Perspectives: Psychodynamic, Behavioural, Humanistic, Biological and Cognitive
- General, Bio–Physiological, Social, Child, Developmental, Abnormal and Cognitive Psychology.
- Psychology as Applied Science: Introspection, Observation, Experimental, Clinical And Questionnaire Method.

UNIT– II: BIOLOGY AND BEHAVIOUR (12 hours) • Neuron: Structure and functions; Neural impulse; Synapse and Neurotransmitters • Nervous system: Structure and Functions of Central nervous system and Peripheral nervous system

- Methods of studying brain functions: invasion, lesion, ablation, chemical and stimulation method
- Endocrine system: Functions and Effects : Pituitary, Thyroid, Parathyroid, Adrenal and Gonads

UNIT-III: SENSATION, ATTENTION AND PERCEPTION (10 hours) •

Sensation: Definition and Characteristics.

- Types of Senses and Receptors Involved in Each Sensation.
- Attention: Meaning and Phenomena (Span of Attention, Division of Attention, Fluctuation and distraction), Determinants: Objective and Subjective.
- Perception: Meaning and Characteristics, Gestalt Laws of Perceptual Organization. •

Depth Perception: Meaning, Perceptual Constancies, Monocular and Binocular Cues

- Errors in Perception -

  1) Illusion - Types - Horizontal-Vertical, Muller Lyer and Illusion of Movement. 2) Hallucination- Visual, Auditory and Tactile

UNIT-IV: LEARNING (14 hours) • Introduction: Definition, Factors Influencing Learning: Motivation, Reinforcement and Association.

- Types of Learning: Trial and Error Learning: Experiment and Laws. Classical Conditioning,

Extinction, Spontaneous Recovery, Generalization, Discrimination, Higher Order Conditioning.

- Operant Conditioning: Experiment (experiment on Pigeons) Reinforcement, Schedules of Reinforcement, Shaping and Chaining.
- Cognitive Learning: Insightful (Kohler) and Observational (Bandura)

UNIT-V: MEMORY AND FORGETTING (10 hours) • Memory: Basic Processes – Encoding, Storage and Retrieval.

- Types of Memory: Sensory Memory, Short-Term Memory Long-Term Memory, Working Memory, Semantic Memory, Autobiographical Memory and Flashbulb Memory.
- Techniques to Improve Memory: Mnemonics, Chunking, SQ3R (Survey, Question, Read, Recite and Review)
- Forgetting: Nature and Causes of Forgetting

Text Books:

- Robert Feldman (2011) Essential of *Understanding Psychology* 10th Edition, ISBN-13-9781259003059/ISBN–10–1259003051
- Morgan, C. T., King, R. A., Weiss, J. R. and Schopler, J. (2012). (Latest Edition).*Introduction to Psychology.* Tata McGraw Hill Education Pvt. New Delhi
- Nataraj, P. (latest edition): *Psychology for Beginners*. Mysore :Srinivas publication • Parameshwaran, E. G., & Beena, C. (2010): *An Invitation to Psychology*, Neelkamal Pvt. Hyderabad

Reference:

1. Mangal S.K.(2000) General Psychology. New Delhi: Sterling Publishers Pvt.Ltd. 2. Shashi Jain (Latest edition). Introduction to Psychology. New Delhi: Kalyani Publishers. 3. Rajamanickam, M. (2008). Modern General Psychology. Vol 1 & 2. Concept Publisher. New Delhi.

PRACTICALS: **4 hours per week. Maximum Marks: 50**

(Minimum 8 Practical to be conducted)

1. Directed Observation on the accuracy of report
2. Colour blindness
3. Localisation of sound

4. Mapping of colour zones
5. Set on Attention
6. Bilateral transfer oftraining
7. Muller-Lyer Illusion
8. Illusion of movement (Phi-Phenomena)
9. Meaning on retention
10. Retroactive Inhibition
11. Proactive Inhibition
12. Span of attention

STATISTICS

- Grouping of Data: Tabulation and frequency distribution
- Measures of Central tendency: Mean and Median for Grouped and Ungrouped data

Practical batches: 10 students per batch

Exam: **10 students per batch**

Mark**: 35 marks for semester end examination +15 marks for Journal records as an internal assessment**

35 marks for exam: Plan and procedure 05

Conducting one experiment 10

Results and discussion 05

Viva 05

Statistics 10

Total 35

OPEN ELECTIVE COURSE (OEC)

Teaching Hours: 3 hours per week (Total 30 hours)

Credit: 2 Marks for Exam: 70 IA Marks: 30

Psychology of Health and Wellbeing

Learning Outcomes

1. Understanding the spectrum of health and illness for better health management
2. Identifying stresses in one's life and how to manage them
3. Understanding a variety of health announcing health protective and health compromising behaviours and to be able to know their application in illness management

Course Content

Unit 1: Illness, Health and Wellbeing; Health continuum; models of health and illness: Medical, Bio psychosocial; Holistic Health; Health and Wellbeing. 7hrs

Unit 2: Stress and Coping: Nature and Sources of Stress; Personal and Social Mediators of Stress; Effects of Stress on Physical and Mental Health; Coping and Stress management 8hrs.

Unit 3: Health Management: Health enhancing behaviours:Exercise,Nutrition, Meditation, Yoga; Health compromising behaviours (alcoholism, smoking, internet addiction); Health Protective behaviours, Illness Management. 8hrs

Unit 4: Promoting Human Strengths and Life Enhancement: Strength: Meaning; Realizing strength; Maximizing Unrealized Strength. Weakness – Meaning, Identifying & Overcoming Weakness. Strategies to develop hope and optimism. 7hrs

References:

Carr. A. (2004) Positive Psychology: The science of happiness and human strength UK: Routledge.

DiMatteo, M.R &. Martin, L.R.(2002). Health Psychology. New Delhi: Pearson.

Farshaw, M 2DD3) Advanced PsychoIo9Y: Health Psychology. London:Hodder and Stoughton

Forshaw, M. (2003).Advanced Psychology: Health Psychology. London: Hodder and Stou9htan.

Hick.J.W. (2005).Fifty signs of Mental Health.A Guide to understanding mental health.Yale University Press.

Snyder, C R., & Lopez. S.J.(2007) Positive Psychology: The scientific and practical explorations of human strengths. Thousand Oaks, CA Sage.

Taylor. S.E. 2006).Health Psychology.6th Edition.Flew DelhI: Tata M

Life Skills: 1

Objective:

Life skills training equips people with the social and interpersonal skills that enable them to cope with the demands of everyday life. The objectives of this course are to build self confidence, encourage critical thinking, foster independence and help people to communicate more effectively and work effectively in groups at personal and professional level

Course Outcomes:

CO1: Understand the need and importance of life skills in everyday professional and personal lives

CO2: Analyse the factors contributing to develop self awareness, empathy, critical and creative thinking and enhance decision making and problem solving

CO3: Solve professional and personal barriers using efficient critical and creative thinking and effective decision making and problem solving

CO4 : Create individual effective strategies to develop self awareness, empathy , critical and creative thinking and enhance decision making and problem solving

---

Unit 1: Overview of Life Skills

- Meaning and significance of life skills
- Life skills identified by WHO: Self-awareness, Empathy, Critical thinking, Creative thinking, Decision making, problem solving, Effective communication, interpersonal relationship, coping with stress, coping with emotion
- Use of Life skills in personal and professional life
- Life Skills Training – Models-4 H,
- Life Skills Education in the Indian Context.

Unit 2:Self-awareness and empathy:

- Definition and need for self-awareness and empathy;
- Self-esteem and self-concept
- Human Values, tools and techniques of Self-awareness and empathy · Activities: Johari window and SWOC analysis, Journaling, reflective questions, meditation, mindfulness, psychometric tests and feedback.

Unit 3: Critical and creative Thinking

- Definition and need for Creativity and Critical Thinking

· Need for Creativity in the 21st century, Imagination, Intuition, Experience and Sources of Creativity

· Lateral Thinking

· Critical thinking Vs Creative thinking, Convergent & Divergent Thinking. · Activities :Fish Bowl , Debates , 9 dots puzzle, Circles of possibilities, Best out of waste, Socratic seminars, Group discussion , brain storming and lateral thinking exercises

Unit 4: Decision Making and Problem Solving

· Definition of decision making and problem solving

· Steps in problem solving: Problem Solving Techniques

· Analytical Thinking, Numeric, symbolic, and graphic reasoning. Scientific temperament and Logical thinking

· Activities: Six Thinking Hats, Mind Mapping, Forced Connections, A shrinking vessel, reverse pyramid.

References:

· Barun K. Mitra, "Personality Development & Soft Skills", Oxford Publishers, Third impression, 2017.

· ICT Academy of Kerala, "Life Skills for Engineers", McGraw Hill Education (India) Private Ltd., 2016.

· Caruso, D. R. and Salovey P, "The Emotionally Intelligent Manager: How to Develop and Use the Four Key Emotional Skills of Leadership", John Wiley & Sons, 2004.

· Kalyana, "Soft Skill for Managers"; First Edition; Wiley Publishing Ltd, 2015. · Larry James, "The First Book of Life Skills"; First Edition, Embassy Books, 2016. · ShaliniVerma, "Development of Life Skills and Professional Practice"; First Edition; Sultan Chand (G/L) & Company, 2014.

DSC2: Foundation of Behaviour with practical (6)

Course Objectives:

· To understand the dynamics of emotions and motivation.

· To understand theoretical concepts of Human Intelligence.

· To analyse and relate the concepts of thinking, problem solving, reasoning and decision making to cognition

· To understand and classify the different types of Personality.

Course Outcomes:

After successful completion of the course students will be able to:

· evaluate and understand the different human emotions

· critically evaluate and identify determinants of motivation

· compare and contrast different theories of intelligence

· differentiate the human personalities

CHAPTER 1 EMOTIONS-

· Meaning and definition,

· Classification of emotions- primary and secondary.

· Responses to emotions- physiological, behavioural, psychological and cognitive. · Theories of emotions-physiological, neurological, cognitive.

· Emotional Intelligence- Meaning, definition, components. Application of emotional intelligence.

CHAPTER 2 MOTIVATION

· MEANING, DEFINITION, BASIC CONCEPTS-

· Instincts, needs, drives, incentives, motivational cycle.

· Approaches to the Study of Motivation: Psychoanalytical, ethological, S – R, Cognitive, humanistic.

· Biological Motives: Hunger, thirst, sleep and sex.

· Social Motives: Achievement, affiliation, approval

CHAPTER 3 INTELLIGENCE-

· Meaning, Definition of intelligence, characteristics of intelligence. · Types- social, crystallized, emotional, fluid.

· Theories of Intelligence- Factor theories, hierarchical theories, process oriented theories, information processing theories.

· Educating Gifted children

· Assessment of intelligence- Indian tests for intelligence. The concept of intelligence quotient.

CHAPTER 4 THINKING AND REASONING.

- Introduction to cognition
- Introduction to Thinking and Problem Solving Process
- Elements of Thinking and Types of Thinking

● Creative and critical thinking : Meaning and types
● Concept Formation: Meaning , importance and process of concept formation ● Problem Solving: Meaning, importance, steps, and obstacles
● Reasoning and decision making

CHAPTER 5 PERSONALITY -

· Meaning, definition,

· Theories of personality- Type and trait, Dynamic, behavioural, Humanistic. · Assessment of personality- Need. Rating scales, questionnaires, Projective techniques.

Books for Reference:

Baron, R. A. (2014).Psychology. (5th ed.). Delhi: PHI Learning Pvt. Ltd. Feldman, R. S. (2018). Understanding Psychology (14th ed.). New York: McGraw Hill Hergenhahn, B. R., & Henley, T. (2013). An Introduction to the history of psychology.Cengage Learning.

Hilgard, E. R., Atkinson, R. C. & Atkinson, R. L. (2015).Introduction to psychology. (16th ed.). Boston: Cengage Learning.

Malim, T. (2017). Introductory Psychology.Macmillan International Higher Education.

Morgan, C. T., King, R. A., Weisz, J. R., &Schopler, J. (2001).Introduction to psychology. (7th ed.). Chennai: McGraw- Hill Education (India) Pvt. Ltd.

Practicals (any????)
MDC2: Foundation of Behaviour with practical (6)
Practical component:
Statistics: Measures of Variance (Grouped and Ungrouped) ● Standard Deviation
● Range
● Quartile deviation

1. Emotions :
a. Emotional regulation scale
b. Emotional intelligence scale/ questionnaire
c. Oxford happiness scale
d. Fear checklist
e. Positive and Negative affect scale

2. Motivation
a. Achievement motivation
b. The motivation assessment scale
c. Power motive inventory/Scale
d. Academic achievement need scale
e. Guidance need inventory

3. Intelligence
a. Standard progressive matrices
b. WAIS (Weschler's adult intelligence Scale)
c. Draw a man test
d. SFB (Seguin Form Board)

e. General Mental Ability Test by Jalota

4. Thinking and reasoning

a. Stroop effect
b. Test of creativity
c. Cognitive style assessment
d. Concept formation
e. Problem solving ability test based on Tower of London test

5. Personality:

a. Eyescenk's personality inventory
b. Children's personality questionnaire
c. 16 PF test of personality
d. NEO Personality Inventory
e. Myers Briggs Types indicator

GEC2: Youth, Gender and Identity

Unit 1: Introduction

a. Concepts of Youth: Transition to Adulthood, Extended Youth in the Indian context b. Concepts of Gender: Sex, Gender Identity, Sexual Orientation, Gender Roles, Gender Role Attitudes, Gender Stereotypes

c. Concepts of Identity: Multiple identities

Unit 2: Youth and Identity

a. Family: Parent-youth conflict, sibling relationships, intergenerational gap b. Peer group identity: Friendships and Romantic relationships

c. Workplace identity and relationships

d. Youth culture: Influence of globalization on Youth identity and Identity crisis

Unit 3: Gender and Identity

a. Issues of Sexuality in Youth

b. Gender discrimination

c. Culture and Gender: Influence of globalization on Gender identity

Unit 4: Issues related to Youth, Gender and Identity

a. Youth, Gender and violence

b. Enhancing work-life balance

c. Changing roles and women empowerment

d. Encouraging non-gender stereotyped attitudes in youth

Unit 5 : Law and Youth

a. Juvenile Justice act

b. LGBT rights in India

c. UNICEF programs for youth

References

Berk, L. E. (2010).Child Development (9th Ed.). New Delhi: Prentice Hall. Baron, R.A., Byrne, D. &Bhardwaj.G (2010).Social Psychology (12th Ed).New Delhi: Pearson.

Elizabeth Herlock (2015) Developmental Psychology, ,McGraw-Hill

NayanaJoshi (2019) : Handbook of Juvenile Justice , Lawmanns Publication

II Semester BA/B.Sc

Life Skills: 2

Objective:

Life skills training equip people with the social and interpersonal skills that enable them to cope with the demands of everyday life. The objectives of this course are to build self confidence, encourage critical thinking, foster independence and help people to communicate more effectively and work effectively in groups at personal and professional level

Course Outcomes:

CO1: Understand the foundations of communication, positive interpersonal relationship, stress and emotion management and group dynamics

CO2: Analyse the factors contributing to effective communication, positive interpersonal relationships and effective stress and emotional management

CO3: Apply the principles of effective communication, positive interpersonal relationships and effective stress and emotional management in everyday life

CO4 : Create individual effective strategies for enhancing communication skills, maintaining health inter personal relationships and positive management of stress and emotions

---

Unit 1: Effective Communication

· Effective communication and Presentation skills.
· Verbal and nonverbal communication, types of barriers
· Writing Skills: Activities: Letter Writing, Job Application, Resume writing. ·
Listening Skills: Activities : Listen and Draw , Blindfold walk
· Activities : Interview Skills, Group Discussion, Presentation Skills, stand up for fillers, Just A Minute

Unit 2: Interpersonal Relationship

· Meaning and benefits of Interpersonal skills

· Components of Interpersonal skills,
· Techniques of improving Interpersonal skills,
· Activities: Role play, Ice breakers, circle time discussions, group discussion, two truths and a lie and SWOC analysis of peer

Unit 3: Coping with Stress and emotions

· Stress Management: Stress, reasons and effects
· Identifying stress, the four A's of stress management
· Identifying and managing emotions, harmful ways of dealing with emotions · Activities : Stress Dairies, PATH method and relaxation techniques, Zen / Mandala drawing, creating Joy Collage, Gratitude Journaling, Eye Contact games

Unit 4: Group and Team Dynamics

· Introduction to Groups: Composition, formation, expectations, Problem Solving, Consensus, Dynamics techniques,
· Group vs Team, Team Dynamics,
· Managing team performance and managing conflicts
· Activities : Chinese Puzzle, Use what you have game ,Group timeline, Do the Math : Cooperation and competition in groups, Barter Puzzle

References:

· Barun K. Mitra, "Personality Development & Soft Skills", Oxford Publishers, Third impression, 2017.
· ICT Academy of Kerala, "Life Skills for Engineers", McGraw Hill Education (India) Private Ltd., 2016.
· Caruso, D. R. and Salovey P, "The Emotionally Intelligent Manager: How to Develop and Use the Four Key Emotional Skills of Leadership", John Wiley & Sons, 2004.
· Kalyana, "Soft Skill for Managers"; First Edition; Wiley Publishing Ltd, 2015. · Larry James, "The First Book of Life Skills"; First Edition, Embassy Books, 2016. · ShaliniVerma, "Development of Life Skills and Professional Practice"; First Edition; Sultan Chand (G/L) & Company, 2014.

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

BOTANY SYLLABUS FOR B.Sc / B.Sc Honours
Semester - 1

Title of the Course: Microbial Diversity and Technology

Number of Theory Credits	Number of lecture hours/semester	Number of practical Credits	Number of practical hours / semester
4	56	2	56

Content of Theory Course 1	56 Hrs
Unit –1	15
Chapter No. 1: Microbial diversity-Introduction to microbial diversity; Methods of estimation; Hierarchical organization and positions of microbes in the living world. Whittaker's five-kingdom system and Carl Richard Woese's three-domain system. Distribution of microbes in soil, air, food and water. Significance of microbial diversity in nature.	5
Chapter No. 2 History and developments of microbiology-Microbiologists and their contributions (Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Dmitri Iwanowski, Sergius Winogradsky and M W Beijerinck and Paul Ehrlich).	5
Chapter No. 3 Microscopy-Working principle and applications of light, dark field, phase contrast and electron microscopes (SEM and TEM). Microbiological stains (acidic, basic and special) and Principles of staining. Simple, Gram's and differential staining.	5

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

Unit – 2	15
Chapter No. 4. Culture media for Microbes-Natural and synthetic media, Routine media -basal media, enriched media, selective media, indicator media, transport media, and storage media.	5
Chapter No. 5. Sterilization methods -Principle of disinfection, antiseptic, tyndallisation and Pasteurization, **Sterilization-**Sterilization by dry heat, moist heat, UV light, ionization radiation, filtration. Chemical methods of sterilization-phenolic compounds, anionic and cationic detergents.	5
Chapter No. 6. Microbial Growth-Microbial growth and measurement. Nutritional types of Microbes- autotrophs and heterotrophs, phototrophs and chemotrophs; lithotrophs and organotrophs.	5
Unit – 3	11
Chapter No. 7 Microbial cultures and preservation-Microbial cultures. Pure culture and axenic cultures, subculturing, Preservation methods-overlaying cultures with mineral oils, lyophilisation. Microbial culture collections and their importance. A brief account on ITCC, MTCC and ATCC.	5
Chapter No. 8. Viruses- General structure and classification of Viruses; ICTV system of classification. Structure and multiplication of TMV, SARS-COV-2, and Bacteriophage (T2). Cultivation of viruses. Vaccines and types.	4
Chapter No. 9. Viroids- general characteristics and structure of Potato Spindle	2

Tuber Viroid (PSTVd); Prions - general characters and Prion diseases**.** Economic importance of viruses.	
Unit – 4	15
Chapter No. 10. Bacteria- General characteristics and classification. Archaebacteria and Eubacteria. Ultrastructure of Bacteria; Bacterial growth and nutrition. Reproduction in bacteria- asexual and sexual methods. Study of *Rhizobium* and its applications. A brief account of Actinomycetes and Cyanobacteria. Mycoplasmas and Phytoplasmas- Generalcharacteristics and diseases. Economic importance of Bacteria.	5
Chapter No. 11. Fungi-General characteristics and classification. Thallus organization and nutrition in fungi. Reproduction in fungi (asexual and sexual). Heterothallism and parasexuality. Type study of *Phytophthora,Rhizopus*, *Neurospora, Puccinia, Penicillium and Trichoderma***.**	5
Chapter No. 12. Lichens – Structure and reproduction. **VAM Fungi** and their significance. **Fungal diseases**-Late Blight of Potato, Black stem rust of wheat;Downy Mildew of Bajra, Grain smut of Sorghum, Sandal Spike, Citrus Canker, RootKnot Disease of Mulberry. Economic importance of Fungi.	5

Text Books

1. Ananthnarayan R and Panikar JCK. 1986. Text book of Microbiology. Orient Longman ltd. New Delhi.
2. Arora DR. 2004. Textbook of Microbiology, CBS, NewDelhi.

3. William CG. 1989. Understanding microbes. A laboratory text book for Microbiology. W.H. Freeman and Company. New York.
4. Dubey RC and Maheshwari DK. 2007. A textbook of Microbiology, S. Chand and Company, NewDelhi.
5. Dubey RC and Maheshwari DK. 2002. A Text book of Microbiology, S.C.Chand and Company, Ltd. Ramnagar, New Delhi.
6. Sharma R. 2006. Text book of Microbiology. Mittal Publications. New Delhi. 305pp.
7. Sharma PD. 1999. Microbiology and Plant Pathology. Rastogi publications. Meerut, India.
8. Vasanthkumari R. 2007. A textbook of Microbiology, BI Publications Pvt. Ltd., New Delhi.

References

1. Alexepoulos CJ and Mims CW. 1989. Introductory Mycology, Wiley Eastern Ltd., NewDelhi.
2. Allas RM. 1988. Microbiology: Fundamentals and Applications, Macmillan publishing co. New York.
3. Brook TD, Smith DW and Madigan MT. 1984. Biology of Microorganisms, 4th ed. Eaglewood Cliffts. N.J.Prentice- Hall. New Delhi.
4. Burnell JH and Trinci APJ. 1979. Fungal walls and hyphal growth, Cambridge UniversityPress. Cambridge.
5. Jayaraman J. 1985. Laboratory Manual of Biochemistry, Wiley Eastern Limited. New Delhi.
6. Ketchum PA. 1988. Microbiology, concepts and applications. John Wiley and Sons. New York.
7. Michel J, Pelczar Jr.EC and Krieg CR. 2005. Microbiology, Mc.Graw-Hill, New

Delhi.

8. Powar CB and Daginawala. 1991. General Microbiology, Vol – I and Vol – II Himalaya publishing house,Bombay.
9. Reddy S and Ram. 2007. Microbial Physiology. Scientific Publishers, Jodhpur, 385pp.
10. Sullia SB and Shantharam S. 1998. General Microbiology. Oxford and IBH publishing Co.Pvt.Ltd. New Delhi.
11. Schlegel HG. 1986. General Microbiology. Cambridge. University Press. London, 587pp.
12. Roger S, Ingrahan Y, Wheelis JL, Mark L and Page PR. 1990. Microbial World 5th edition. Prentice-Hall India, Pvt. Ltd. New Delhi.
13. Sullia SB. and Shantharam S. 2005. General Microbiology, Oxford and IBH, NewDelhi.

Pedagogy:
Lectures, Practicals, Field and laboratory visits, Participatory Learning, Seminars, Assignments, specimen submission etc

Assessment Occasion/ type	**Weightage in Marks**
Formative Assessment / IA	40
Summative Assessment / ESE	60
Total	100

Content of Practical Course 1: List of Experiments to be conducted

Practical 1: Safety measures in microbiology laboratory and study of equipment/appliances used for microbiological studies (Microscopes, Hot air oven, Autoclave/Pressure Cooker, Inoculation needles/loop, Petri plates, Incubator, Laminar flow hood, Colony counter, Haemocytomer, Micrometer etc.).

Practical 2: Enumeration of soil/food /seed microorganisms by serial dilution technique.

Practical 3: Preparation of culture media (NA/PDA) sterilization, inoculation, incubation of *E coli / B. subtilis/* Fungi and study of cultural characteristics.

Practical 4: Determination of cell count by using Haemocytometer and determination of microbial cell dimension by using Micrometer.

Practical 6: Simple staining of bacteria (Crystal violet /Nigrosine blue) / Gram's staining of bacteria.

Practical 7: Isolation and study of morphology of *Rhizobium* from root nodules of legumes

Practical 8: Preparation of spawn and cultivation of paddy straw (Oyster) mushroom.

Practical 9: Study of vegetative structures and reproductive structures - *Albugo,Phytophthora/Pythium, Rhizopus/Mucor, Saccharomyces, Neurospora/ Sordaria, Puccinia, Agaricus, Lycoperdon, Aspergillus/Penicillium, Trichoderma.(Depending on local availability)*

Practical 10: Preparation of agar slants, inoculation, incubation, pure culturing and preservation of microbes by oil overlaying.

Practical 11: Study of late blight of Potato, Downy mildew of Bajra, Citrus canker, Tobaccomosaic disease, Sandal spike disease.

Practical 12: Study of well-known microbiologists and their contributions through charts andphotographs.

Practical-13: Visit to water purification units/Composting/ microbiology labs/dairy andfarms to understand role of microbes in day today life.(Submission of Report compulsory)

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

SURANA COLLEGE

(AUTONOMOUS)

Department of Chemistry

#16, South End Road, Basavanagudi,
Bangalore - 560004, INDIA

Syllabus for

I & II Semester Chemistry Courses

Under-Graduate (UG) Programme

Framed according to the National Education Policy (NEP 2020)

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

FOREWORD

National Education policy 2020 has been one among the intensely debated policies in the recent times. Given the long reach of Education as a social and economic transformation tool - more so for a developing nation like ours- the traction it has garnered in public domain is no surprise.

Karnataka is the first state in the country to implement NEP in higher education. But playing the role of a pioneer is not child's play. Transforming the policy into a working framework and befitting a competent curriculum and syllabus is always a challenging task. The state has come up with the NEP framework for all the UG programmes starting from the academic year 2021.

Undergraduate programmes were traditionally conceived as preparation for post graduation. Since decades its structure remained unchanged and was long due for an overhaul. The rigidity in choosing subjects through fixed combinations had to be reconsidered. The aspects of all-round development of the students, skill acquisition outside chosen subjects and research were undermined but NEP has changed all of these in one stroke.

The prominent features of the NEP framework are:

I. Flexibility in choosing subjects and even disciplines for the graduate programmes
II. Vertical and horizontal mobility across subjects throughout the programme
III. Multiple entry and exit points
IV. Main-streaming of skill based courses
V. Credit based evaluation system
VI. Integration of research into 4^{th} year of the programme leading to Honors degree

Such radical modifications have put the learner at the center of the education system. The framework has nudged the academic faculty to work out syllabi aligned with national standards, if not global. The road map is in place. It is the implementation of NEP in its letter and spirit that would catalyze raising the bar for the quality in Higher Education.

I place on record my appreciation and regard to all those who were involved in the endeavor of the syllabus preparation for the undergraduate Chemistry programme of Bangalore University. The fact that all efforts have been made to align the syllabus with the NEP structure is further satisfying. I sincerely hope that periodical revisions will take place in coming years.

Chemistry Syllabus for B.Sc. / B.Sc. (Honors) Programme

Discipline Core: Chemistry **Total Credits for the Programme: 186**

Year of implementation: 2021-22

Programme Outcomes:

By the end of the programme the students will:

1. Understand the basic principles of various branches of Chemistry
2. Demonstrate a range of practical skills to conduct and infer experiments independently and in groups
3. Apply the key concepts and standard methodologies to solve problems related to Chemistry
4. Apply methodologies to the solution of unfamiliar types of problems
5. Exhibit skills leading to employability in Chemistry and allied industries
6. Comprehend the fundamental aspects of research in Chemistry
7. Possess the level of proficiency in subject required for post graduation as well as for pursuing research in Chemistry and related interdisciplinary subjects
8. Design solutions stemming from the application of Chemistry to the local issues

Assessment: Weightage for assessments (in percentage)

Type of Course	Formative Assessment / IA	Summative Assessment/ESE
Theory	40	60
Practical	25	25
Projects	-	-
Experiential Learning (Internships etc.)	-	-

PROGRAMME STRUCTURE

Sem.	Discipline Core (DSC) (L+T+P)	Discipline Elective(DSE)/ Open Elective (OE)	Ability Enhancement Compulsory Courses (AECC), Languages (L+T+P)		Skill Enhancement Courses (SEC)		Total Credits
					Skill based (L+T+P)	Value based (L+T+P)	
I	DISCIPLINE A1 (4 + 2) DSC-1:Analytical and Organic Chemistry-I DSC lab-1:Analytical and	OE – 1 (3 CREDITS) Chemistry in	L1-1 (3), L2-1(3)		SEC-1: Digital Fluency (2) (1+0+2)	Physical education and Yoga(1) (0+0+2),	25

	Organic Practicals-I DISCIPLINE-B1(4+2)	Daily Life				Health and Hygiene(1)(0+0+2)	
II	DISCIPLINE A2(4 + 2) DSC-2:Inorganic and Physical Chemistry-I DSC Lab-2:Inorganic and Physical Practicals-I DISCIPLINE-B2(4+2)	OE – 2 (3 CREDITS) Molecules of Life	L1-2(3), L2-2 (3) (3+1+0 each)	Environmental Studies (2)		Health and Wellness/ Social & Emotional Learning (2)	25
Exit option with Certificate (50 credits)							
III	DISCIPLINE A3(4 + 2) DSC-3:Analytical and Organic Chemistry-II DSC Lab-3: Analytical and Organic Practicals-II DISCIPLINE-B3(4+2)	OE – 3 (3 CREDITS)	L1-3 (3), L2-3(3) (3+1+0 each)		SEC-2: Artificial Intelligence(2)(1+0+2)	Sports/NCC/ NSS etc(0+0+2)	25
IV	DISCIPLINE A4(4 + 2) DSC-4: Inorganic and Physical Chemistry-II DSC Lab-4: Inorganic and Physical Practicals-II DISCIPLINE-B4(4+2)	OE – 4 (3 CREDITS)	L1-4 (3), L2-4(3) (3+1+0 each)	Constitution of India (2)		Sports/NCC/ NSS etc (0+0+2)	25
Exit option with Diploma (100 credits)							
Choose any one Discipline as Major, the other as the Minor							
V	DISCIPLINE A5 (3 + 2) DSC-5: DSC Lab-5 DISCIPLINE A6 (3 + 2) DSC-6: DSC Lab-6: DISCIPLINE B5 (3 + 2)	Vocational 1 (3 CREDITS)			SEC-3: (2) SEC such as Cyber security(2) (1+0+2)	Physical Education(1) (0+0+2) NCC/NSS/R&R(S&G)/Cultural)(1) (0+0+2)	22
VI	DISCIPLINE A7 (3 + 2) DSC-7 DSC Lab-7 DISCIPLINE A8 (3 + 2) DSC-8 DSC Lab-8 DISCIPLINE B6 (3 + 2)	Vocational 2 (3 CREDITS) Internship (2 CREDITS)			SEC-4: Professional Communication(2)	Physical Education(1) (0+0+2) NCC/NSS/R&R(S&G)/Cultural)(1)(0+0+2)	24
Exit option with B. Sc. Basic Degree (146 credits)							
VII	DISCIPLINE A9 (3 + 2) DSC-9						

	DSC Lab-9 DISCIPLINE A10 (3) DSC-10 DISCIPLINE A11 (3) DSC-11	DSE A3 (3 CREDITS) DSE A4 (3 CREDITS RESEARCH METHODOLOGY (3 CREDITS)					20
VIII	DISCIPLINE A12 (3+2) DSC-12 DISCIPLINE A13 (3) DSC-13 DISCIPLINE A14 (3) DSC-14	DSE A4 (3 CREDITS) RESEARCH PROJECT (6 CREDITS)					20
Award of B.Sc. (Hons) degree (186 credits)							

***In lieu of the research Project, two additional elective papers/ Internship may be offered.**

COURSE PATTERN AND SCHEME OF EXAMINATION

Sl. No.	Semester	Title of the Paper	Teaching Hours	Hours / week		Examination Pattern Max. & Min. Marks /Paper						Duration of Exam (hours)		Total Marks / paper	Credits	
				Theory	Practical	ESE(Theory)		IA	ESE(Practical)			Theory	Practical		Theory	Practical
						Max.	Min.		Max.	Min.	IA					
1	I	**DSC-1: Analytical and Organic Chemistry-I**	**56**	**4**	**-**	**60**	**22**	**40**	**-**	**-**	**-**	**3**	**-**	**100**	**4**	**-**
		DSC LAB-1: Analytical and Organic Chemistry-I	**56**	**-**	**4**	**-**	**-**	**-**	**25**	**10**	**25**	**-**	**4**	**50**	**-**	**2**
		Chemistry-OE-1: Chemistryin Daily life	**42**	**3**	**-**	**60**	**22**	**40**	**-**	**-**	**-**	**3**	**-**	**100**	**3**	**-**

2	**II**	**DSC-2: Inorganic and Physical Chemistry-I**	**56**	**4**	**-**	**60**	**22**	**40**	**-**	**-**	**-**	**3**	**4**	**100**	**4**	**-**
		DSC LAB-2: Inorganic and Physical Chemistry-I	**56**	**-**	**4**	**-**	**-**	**-**	**25**	**10**	**25**	**-**	**4**	**50**	**-**	**2**
		Chemistry-OE-2:- Molecules of Life	**42**	**3**	**-**	**60**	**22**	**40**	**-**	**-**	**-**	**3**	**-**	**100**	**3**	**-**

Scheme of Internal Assessment Marks: Theory

Sl. No.	**Particulars**	IA Marks
1	Attendance	**05**
2	Internal Tests (Minimum of Two)	**25**
3	Assignments /Seminar	**10**
TOTAL Theory IA Marks		**40**

Scheme of Internal Assessment Marks: Practicals

Sl. No.	**Particulars**	IA Marks
1	Practical Test	**20**
2	Active participation in practical classes	**05**
TOTAL Practical IA Marks		**25**

Programme Articulation Matrix:

This matrix lists only the core courses. Core courses are essential to earn the degree in that discipline/subject. They include courses such as theory, laboratory, project, internships etc. Elective courses may be listed separately

Semester	Title /Name Of the course	Programme outcomes that the course addresses	Pre-requisite course(s)	Pedagogy	Assessment
1	**DSC-1: Analytical and Organic Chemistry-I**	• The concepts of chemical analysis, accuracy, precision and statistical data treatment • Understand the preparation of alkanes, alkenes and alkynes, their reactions, etc. • Understand the mechanism of nucleophilic, electrophilic reactions	P.U.C with Chemistry	Assignment Desk work	Internal Exams, Continuous Evaluation, Sem Exams
	DSC lab-1: Analytical and Organic Practicals-I	• The students will be able to learn how to handle the glassware, prepare and dilute solutions and perform the experiments with prepared reagents • The students will be able to determine the analyte through volumetric and gravimetric analysis and understand the Chemistry involved in each method of analysis. • The students will be able to deduce the conversion factor based on stoichiometry and in turn use this value for calculation	-	Assignment Desk work	Internal Exams, Continuous Evaluation, Sem Exams
2	**DSC-2: Inorganic and Physical Chemistry-I**	• The Bohr's theory of atomic structure and how it was developed • Quantum numbers and their necessity in explaining the atomic structure • The concept of unit cell, symmetry elements, Nernst distribution law.	-	Assignment Desk work	Internal Exams, Continuous Evaluation, Sem Exams
	DSC Lab -2: Inorganic and Physical Practicals-I	• Techniques like precipitation, filtration, drying and ignition • Various titrimetric techniques and gravimetric methods		Assignment Desk work	Internal Exams, Continuous Evaluation, Sem Exams

		To determine the physical constants of organic liquids and molecular weight of non-volatile solute.			
3	**DSC-3: Analytical and Organic Chemistry-II** **DSC Lab-3: Analytical and Organic Practicals-II**		DSC-1 and DSC-2	Assignment Desk work	Internal Exams, Continuous Evaluation, Sem Exams
4	**DSC-4: Inorganic and Physical Chemistry-II** **DSC Lab-4: Inorganic and Physical Practicals-II**			Assignment Desk work	Internal Exams, Continuous Evaluation, Sem Exams
5.	**DSC-5:** **DSC Lab-5:** **DSC-6:** **DSC Lab-6:**		DSC-3 and DSC-4	MOOC, Problem solving	Internal tests, Assignments, Quiz
6.	**DSC-7:** **DSC Lab-7:** **DSC-8:** **DSC Lab-8:**			MOOC, Problem solving	Internal tests, Assignments, Quiz
7.	**DSC-9 :** **DSC Lab-9:** **DSC-10:** **DSC Lab-10 :** **DSC-11:**		DSC-5, DSC-6, DSC-7 and DSC-8	MOOC, Problem solving	Internal tests, Assignments, Seminar, Debate, Quiz
8.	**DSC-12:** **DSC Lab-12** **DSC-13:** **DSC Lab-13** **DSC-14:**			Project work, Industrial Visit	Internal tests, Assignments, Seminar, Debate, Quiz

Semester 1

Course Title: DSC-1: Analytical and Organic Chemistry-I	
Total Contact Hours: 56	Course Credits: 4
Formative Assessment (IA) Marks: 40	Duration of Summative Assessment/ ESE: 3 hrs
Syllabus Authors: Chairman	Summative Assessment Marks: 60

Course Pre-requisite(s): *PUC with Chemistry*/ Any equivalent

Course Outcomes (COs):

At the end of the course the student should be able to:

1. Learn the concepts of chemical analysis, accuracy, precision and statistical data treatment
2. Prepare the solutions after calculating the required quantity of salts in preparing the reagents/solutions and dilution of stock solution.
3. Know the concept of volumetric and gravimetric analysis and deducing the conversion factor for determination
4. Handle toxic chemicals, concentrated acids and organic solvents and practice safety procedures.
5. Understand the concepts of Organic reactions and techniques of writing the movement of electrons, bond breaking, bond forming
6. Learn the Concept of aromaticity, resonance, hyper conjugation, etc.
7. Understand the preparation of alkanes, alkenes and alkynes, their reactions, etc.
8. Understand the mechanism of nucleophilic, electrophilic reactions

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Programme Outcomes (POs 1-8)

Course Outcomes (COs) / Programme Outcomes (POs)	1	2	3	4	5	6	7	8
1. Learn the concepts of chemical analysis, accuracy, precision and statistical data treatment	X							
2 Prepare the solutions after calculating the required quantity of salts in preparing the reagents/solutions and dilution of stock solution		X						
3.Know the concept of volumetric and gravimetric analysis and deducing the conversion factor for determination		X	X					
4. Handle toxic chemicals, concentrated acids and organic solvents and practice safety procedures						X		
5 Understand the concepts of Organic reactions and techniques of writing the movement of electrons, bond breaking and bond forming			X	X				
6. Learn the Concepts of aromaticity, resonance and hyper conjugation	X					X	X	
7 Understand the preparation of alkanes, alkenes, alkynes and their reactions			X			X		
8 Understand the mechanism of nucleophilic and electrophilic reactions						X	X	X

Course Articulation Matrix relates course outcomes of course with the corresponding programme outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular programme outcome.

Title of the Course: DSC-1: Analytical and Organic Chemistry – I

Number of Theory Credits	Number of lecture hours/ semester
4	**56**

Content of Theory Course 1	56Hrs
Unit – 1	14 Hrs
Analytical Chemistry: Definitions of analysis, determination, measurement, techniques and methods. Classification of analytical techniques. Choice of an analytical method - accuracy, precision, sensitivity, selectivity, method validation. Figures of merit of analytical methods and limit of detection (LOD), Limit of quantification (LOQ), linear dynamic range (working range). Errors and treatment of analytical data:Limitations of analytical methods – Errors: Determinate and indeterminate errors, absolute error, relative error, minimization of errors. Statistical treatment of finite samples -mean, median, range, standard deviation and variance. External standard calibration - regression equation (least squares method), correlation coefficient (R^2). Acid-base titrimetry: Titration curves for strong acid vs strong base, weak acid vs strong base and weak base vs strong acid titrations. Titration curves, Quantitative applications – selecting and standardizing a titrant, inorganic analysis - alkalinity, acidity. Complexometric titrimetry: Indicators for EDTA titrations - theory of metal ion indicators, titration methods employing EDTA - direct, back, displacement and indirect determinations, Application-determination of hardness of water. Redox titrimetry: Balancing redox equations, calculation of the equilibrium constant of redox reactions, titration curves, Theory of redox indicators, calculation of standard potentials using Nernst equation. Applications. Precipitation titrimetry: Titration curves, titrants and standards, indicators for precipitation titrations involving silver nitrate- Volhard's and Mohr's methods and their differences. Gravimetric Analysis: Requisites of precipitation, mechanism of precipitation, Factors influencing precipitation, Co-precipitation, post-precipitation, Advantages of organic reagents over inorganic reagents, reagents used in gravimetry (8-hydroxy quinoline (oxine) and dimethyl glyoxime (DMG). Numerical problems on all the above aspects.	
Unit - 2	14 Hrs
Classification and nomenclature of organic compounds, hybridization-types, shapes of organic molecules, influence of hybridization on bond properties. **Nature of bonding in Organic molecules** Types of chemical bonding, formation of covalent bond, notations used to represent electron movements and directions of reaction- curly arrows, formal charges. Types of bond breaking- homolytic and heterolytic. Types of reagents-Electrophiles, nucleophiles, nucleophilicity and basicity. Homolytic and heterolytic fission of bonds. Carbocations, carbanions, free radicals, carbenes, nitrenes and benzyne.**Electronic displacement effects**: Inductive effects, Electromeric effect, Resonance effect, Hyperconjugation and steric effects, explanation with examples. **Types of Organic Reactions:** Substitution, addition, elimination, rearrangement and pericyclic reactions, explanation with examples. **Aliphatic Hydrocarbons:Alkanes**: Nomenclature of branched chain alkanes; *Preparation:* Corey-House synthesis, Wurtz reaction and Wurtz-Fittig reaction. Physical and chemical properties (Free radical substitution, halogenation- relative reactivity and selectivity) and commercial importance. Difference between conformation and configuration. Conformations of ethane, propane and n-butane, explanation of stability based on energy profile diagrams. Nomenclature of n-butane conformations using Klyne-Prelog terminology. Conformation and stability of 1,2-	

dichloroethane, ethylene glycol and acetaldehyde. **Cycloalkanes:** Nomenclature, method of formation. Explanation for stability based on heat of hydrogenation data. Baeyer's strain theory and stability of cyclopropane. Conformations of cyclohexane (chair, twist boat, boat, half-chair and envelop forms and their stability). Geometrical isomerism with examples, *cis* and *trans* isomerism in 1,2-dimethylcyclopropane and 1,2-dimethylcyclohexane.	
Unit - 3	14 Hrs
Carbon-carbon pi bonds **Alkenes**: Preparation by Wittig reaction-stereoselectivity, from but-2-yne to cis-alkenes – (partial catalytic hydrogenation) and trans-alkenes – (Birch reduction). Formation of alkenes by elimination reaction. Mechanism of E_1, E_2, E_1cB reaction. Saytzeff and Hofmann eliminations. Reactions: Addition of halogens to alkenes-carbocation and halonium ion mechanism. Stereospecificity of halogen addition. Addition of hydrogen halides to alkenes (Free radical addition of HBr to propene), mechanism, regioselectivity and relative rates of addition. Ozonolysis mechanism - ozonolysis of propene. Hydrogenation, hydration, hydroxylation and epoxidation of alkenes, explanation with examples. Diels-Alder reaction, allylic and benzylic bromination and mechanism in propene, 1-butene, 1-toluene and ethylbenzene. Conformation and stability of propene. Steric effect- Relative stability of trans and cis-2-butene. **Dienes:** Classification- isolated, conjugated and cumulated- one example. Structure of allene and butadiene. **Reactions:** 1, 2 addition and 1, 4 addition reactions. Diels Alder reaction: 1, 3-butadiene with maleic anhydride. **Alkynes**: Preparation*:* Acetylene from CaC_2 and conversion into higher alkynes; by dehalogenation of tetra halides and dehydrohalogenation of vicinal-dihalides. Reactions: alkylation of terminal alkynes and conversion to higher alkynes, ozonolysis and oxidation with hot alk. $KMnO_4$.	
Unit - 4	14 Hrs
Nucleophilic substitution:. Mechanism of S_N^1 and S_N^2 reactions with suitable examples. Energy profile diagrams, Stereochemistry and factors effecting S_N^1 and S_N^2 reactions **Arenes:** Nomenclature: mono, di and tri substituted benzenes, aromaticity: Huckel's rule - application to benzenoid (benzene, naphthalene, anthracene and phenanthrene) and non-benzenoid (cyclopropenyl cation, cyclopentadienyl anion, tropylium cation) compounds, anti-aromaticity, homoaromaticity. Benzene: molecular orbital picture and resonance energy. Preparation-from phenol, by decarboxylation, from acetylene, from benzene sulphonic acid. Aromatic Electrophilic substitution reactions, mechanisms, σ and π complexes, Halogenation, Nitration, Sulphonation, Friedel Crafts alkylation and acylation with their mechanism. Activating and deactivating groups. Orientation influence, Ortho-para ratio. Aromatic nucleophilic substitution reaction: S_N^{Ar} and Benzyne mechanism with suitable examples, Birch reduction, side chain oxidation of toluene to benzaldehyde and benzoic acid. Polynuclear hydrocarbons: naphthalene, anthracene and phenanthrene- Preparations, resonance structures, oxidation of naphthalene, anthracene and phenanthrene. Electrophilic and nucleophilic substitution reactions of naphthalene and anthracene. Diels-Alder reaction of anthracene with 1,2-dichloroethene. Alkenyl benzenes: Styrene, *cis*- and *trans*-stilbenes and their preparations. Biphenyl: Preparation-Ullmann reaction.	

Text Books

1. Vogel's Textbook of Quantitative Chemical Analysis, J. Mendham, R.C. Denney, J.D.Barnes and M.J.K. Thomas, 6th edition, Third Indian Reprint, Pearson Education Pvt.Ltd.(2007).
2. Analytical Chemistry, G.D. Christian, 6th edition, Wiley-India (2007).
3. Morrison, R. N. & Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education)

4. Organic Reaction mechanism by V. K. AhIuwalia and K. Parashar (Narosa Publishers).
5. Organic Chemistry by S. M. Mukherji, S. P. Singh and R. K. Kapoor. (Narosa Publishers)

References

1.Finar, I. L. *Organic Chemistry (Volume I),* Dorling Kindersley (India) Pvt. Ltd. (Pearson Education)

2.McMurry, J. E. *Fundamentals of Organic Chemistry,* 7th Ed. Cengage Learning India Edition, 2013

Pedagogy :

Chalk and Talk, ICT Tools and Models

Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Formative Assessment/ IA	40
Summative Assessment/ESE	60
Total	100

DCE-Lab-1 Analytical and Organic Practicals-1

Course Outcome:

After studying the course the student will be able to

1. Understand the safety practices in the Chemistry Laboratory
2. Develop awareness regarding toxicity of chemicals
3. Know the importance of calibration of glassware, pipette, burette and volumetric flask
4. Prepare standard/working solutions, standardization of solutions and determination of the respective analytes
5. Select suitablesolvent for purification of organic compounds
6. Gain an insight to the mechanism behind the reaction and the significance of catalysts
7. Learn the importance of green methods over conventional methods and proficiently handle the byproducts and disposal of waste
8. Enthuse students to conduct experiments by arousing the curiosity which would help them in learning basics and advanced concepts through simulation-based labs

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Programme Outcomes (POs 1-8)

Course Outcomes (COs) / Programme Outcomes (POs)	1	2	3	4	5	6	7	8
1.Understand the safety practices in the Chemistry Laboratory	X	X						
2.Develop awareness regarding toxicity of chemicals	X					X		
3.Know the importance of calibration of glassware, pipette, burette and volumetric flask	X	X						
4.Prepare standard/working solutions, standardization of solutions and determination of the respective analytes	X	X	X					
5.Select suitable solvent for purification of organic compounds		X	X				X	
6.Gain an insight to the mechanism behind the reaction and the significance of catalysts						X		X
7.Learn the importance of green methods over conventional methods and proficiently handle the byproducts and disposal of waste				X			X	X
8.Enthuse students to conduct experiments by arousing the curiosity which would help them in learning basics and advanced concepts through simulation-based labs				X		X		X

Course Articulation Matrix relates course outcomes of course with the corresponding programme outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular programme outcome.

Number of practical Credits	Number of practical hours/ semesters
2	**56**

Tutorials
Calibration of instruments, glasswares etc. to be performed in the beginning of the experiments
Specific arrangements to be made for proper disposal of chemicals, broken glasswares and solutions after the experiments
Green Principles to be adopted in the laboratories
Preparation of Standard solution along with calculations to be taught
Handling and dilution of mineral acids to be emphasized
Use of suitable indicators to be explained

List of Experiments to be conducted

PART-A Analytical Chemistry

1. Safety Practices in the Chemistry Laboratory, knowledge about common toxic chemicals and safety measures in their handling, cleaning and drying of glass wares.
2. Calibration of glassware, pipette, burette and volumetric flask.
3. Determination of sodium carbonate and sodium bicarbonate in a mixture.
4. Determination of alkali present in soaps/detergents
5. Determination of iron(II) using potassium dichromate
6. Determination of oxalic acid using potassium permanganate solution
7. Determination of Fe^{2+} as Fe_2O_3

Virtual Experiments

8. Standardization of EDTA solution and determination of hardness of water
9. Gravimetric estimation of Barium
10. Gravimetric estimation of Nickel

PART-B Organic Chemistry

1. Selection of suitable solvents for Purification/Crystallization of organic compounds.
2. Preparation of acetanilide from aniline using Zn/acetic acid (Green method).
3. Synthesis of p-nitro acetanilide from acetanilide using nitrating mixture.
4. Hydrolysis of methyl m-nitrobenzoate to m-nitrobenzoic acid (Conventional method)
5. Synthesis of diazoaminobenzene from aniline (conventional method).
6. Preparation of dibenzalacetone (Green method).

7. Diels Alder reaction between furan and maleic acid (Green method).

Virtual Experiments

8. Simple Distillation
9. Separation of Compounds by Column Chromatography
10. Detection of Functional Groups

Note:

1. Questions from both sections should be given in each batch.
2. In the first 20 minutes the Teacher should discuss in detail the theory, principle, procedure and calculations
3. Instructions to be given for operating instruments, weighing chemicals and precautions while handling chemicals
4. The last 20 minutes the teacher is expected to solve related problems based on the experiments.

Title of the Course: OE-1: CHEMISTRY IN DAILY LIFE

Course Outcome:

After studying the course the student will be able to

1. Analyse the fat content and minerals in milk, butter and other dairy products
2. Know about various food preservatives, adulterants, additives and their analysis
3. Know about the Sources, role and deficiency symptoms of Vitamins
4. Learn the importance of renewable energy sources
5. Be aware of the applications of polymers as plastics in various fields and strategies for development of environment friendly polymers

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Programme Outcomes (POs 1-8)

Course Outcomes (COs) / Programme Outcomes (POs)	1	2	3	4	5	6	7	8
1.Analyse the fat content and minerals in milk, butter and other dairy products	X		X		X			
2.Know about various food preservatives, adulterants, additives and their analysis				X	X			X
3.Know about the Sources, role and deficiency symptoms of Vitamins	X					X	X	
4.Learn the importance of renewable energy sources	X	X						
5.Be aware of the applications of polymers as plastics in various fields and strategies for development of environment friendly polymers.			X			X		X

Course Articulation Matrix relates course outcomes of course with the corresponding programme outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular programme outcome.

Number of Theory Credits	Number of lecture hours/ semester
3	**42**

Content of Theory Course 1	42 Hrs
Unit – 1	14 Hrs
Dairy Products: Composition of milk and milk products. Analysis of fat content, minerals in milk and butter. Estimation of added water in milk. Beverages: Analysis of caffeine in coffee and tea, detection of chicory in coffee, chloral hydrate in toddy, determination of methyl alcohol in alcoholic beverages. **Food additives, adulterants, and contaminants-** Food preservatives like benzoates, propionates, sorbates, disulphites. Artificial sweeteners: Aspartame, saccharin, dulcin, sucralose, and sodium cyclamate. Flavors: Vanillin, alkyl esters (fruit flavors), and monosodium glutamate. **Artificial food colorants:** Coal tar dyes and non-permitted colors and metallic salts. Analysis of pesticide residues in food.	
Unit - 2	14 Hrs
Vitamins: Classification and Nomenclature. Sources, deficiency diseases, and structures of Vitamin A1, Vitamin B1, Vitamin C, Vitamin D, Vitamin E & Vitamin K1.	

Oils and fats: Composition of edible oils, detection of purity, rancidity of fats and oil. Tests for adulterants like argemone oil and mineral oils. Halphen test. **Soaps & Detergents**: Definition, classification, manufacturing of soaps and detergents, composition and uses	
Unit - 3	14 Hrs
Chemical and Renewable Energy Sources:	
Principles and applications of primary & secondary batteries and fuel cells. Basics of solar energy, future energy storer.	
Polymers: Basic concept of polymers, classification and characteristics of polymers. Applications of polymers as plastics in electronics, automobile components, medical fields and aerospace materials. Problems of plastic waste management. Strategies for the development of environment-friendly polymers.	

Text Books

1. B. K. Sharma: Introduction to Industrial Chemistry, Goel Publishing, Meerut (1998)
2. Medicinal Chemistry- Ashtoush Kar.
3. Analysis of Foods – H.E. Cox: 13
4. Fred Billmeyer: Textbook of polymer science; Willey 3rd addition.

References

1.Foods: Facts and Principles. N. Shakuntala Many and S. Swamy, 4thed. New Age International (1998)

2.Handbook on Fertilizer Technology by Swaminathan and Goswamy, 6th ed. 2001, FAI.

Pedagogy :

Demonstration activities using live examples

Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Formative Assessment/ IA	40
Summative Assessment/ESE	60
Total	100

Semester 2

Course Outcome:

After studying the course the student will be able to

1. Learn scientific theory of atoms, concept of wave functions, the fundamentals of quantum mechanics and concept of operators
2. Understand the physical and chemical characteristics of elements
3. Identify the given element, relative size, charges of proton, neutron and electron and their assembly to form different atoms
4. Learn the theory of dilute solutions, distribution law and its applications
5. Properties of liquid as solvent for various household and commercial use
6. Explain the laws governing the behaviour of ideal gases and real gases including their comparison
7. Understand the laws of crystallography, X-ray diffraction techniques, Bragg's law and its applications
8. Solve the problems related to quantum mechanics, different molecular velocities, critical constants and molar mass of non-volatile solutes

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Programme Outcomes (POs 1-8)

Course Outcomes (COs) / Programme Outcomes (POs)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1.Learn scientific theory of atoms, concept of wave functions, the fundamentals of quantum mechanics and concept of operators	X					X		X
2.Understand the physical and chemical characteristics of elements			X	X				
3.Identify the given element, relative size, charges of proton, neutron and electron and their assembly to form different atoms	X		X	X				
4.Learn the theory of dilute solutions, distribution law and its applications							X	X
5.Properties of liquid as solvent for various household and commercial use					X			X
6.Explain the laws governing the behaviour of ideal gases and real gases including their comparison	X	X	X					
7.Understand the laws of crystallography, X-ray diffraction techniques, Bragg's law and its applications			X		X			
8.Solve the problems related to quantum mechanics, different molecular velocities, critical constants and molar mass of non-volatile solutes				X	X	X	X	

Course Articulation Matrix relates course outcomes of course with the corresponding programme outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular programme outcome.

Title of the Course: DSC – 2: INORGANIC AND PHYSICAL CHEMISTRY– I

Number of Theory Credits	Number of lecture hours per semester
4	**56**

Content of Theory Course 2	56Hrs
Unit – 1	14 Hrs
Atomic structure Review of Bohr's theory and its limitations and atomic spectrum of hydrogen atom. Need of a new approach to atomic structure. Wave mechanics: de Broglie equation, Problems on calculation of wavelength of an electron Heisenberg's Uncertainty Principle and its significance What is Quantum Mechanics? Sinusoidal wave equation (Explain sinusoidal wave, Classical wave mechanics). Schrodinger's wave equation – derivation. Applications of Schrodinger's equation to the hydrogen atom. significance of ψ and ψ2 Postulates of quantum mechanics. Hamiltonian operator. Eigen values and function. Concept of orbitals, Radial and angular parts of the hydrogenic wave function (atomic orbitals) and their variations for 1s, 2s, 2p, 3s, 3p and 3d orbitals (graphical representation only). Radial and angular nodes and their significance. Radial distribution functions and the concept of the most probable distance with special reference to 1s and 2s atomic orbitals. Quantum numbers: Significance of quantum numbers. The four types of quantum numbers, shapes, s, p and d atomic orbitals, discovery of spin, spin quantum numbers (s) and magnetic spin quantum number (ms). Electronic configuration of elements. Principles (Aufbau, Pauli's exclusion principle and Hund's rule). Stability of half-filled and completely filled orbitals. Relative energies of atomic orbitals, Anomalous electronic configurations.	
Unit - 2	14 Hrs

Periodic Table & Periodic Properties The long form of periodic table. Classification of elements in to s, p, d and f-block elements. Periodic properties & trends in the periodic properties with reference to s and p-block elements: (a) Atomic radii (van der Waals) (b) Ionic and crystal radii. (c) Covalent radii (d) Ionization enthalpy, successive ionization enthalpies and factors affecting ionization energy. Applications of ionization enthalpy. (e) Electron gain enthalpy, trends of electron gain enthalpy. (f) Electronegativity, Pauling's/ Mulliken's/ Allred Rachow's/ and Mulliken-Jaffé's electronegativity scales. Variation of electronegativity with bond order, partial charge, hybridization, group electronegativity. Trends in the periodic properties. Applications in predicting and explaining chemical behaviour. Trends in the Chemistry of the compounds of groups 13 to 17 (hydrides, carbides, oxides and halides).	
Unit - 3	14 Hrs
Gaseous State Elementary aspects of kinetic theory of gases, Ideal and real gases. Boyle temperature (derivation not required), Molecular velocity, collision frequency, collision diameter, Collision cross section, collision number and mean free path and coefficient of viscosity, calculation of σ and η, variation of viscosity with temperature and pressure. Maxwell's Boltzmann distribution law of molecular velocities (Most probable, average and root mean square velocities). Relation between RMS, average and most probable velocity and average kinetic energies. (Mathematical derivation not required), law of equipartition of energy. Behaviour of real gases: Deviation from ideal gas behaviour. Compressibility factor (Z) and its variation with pressure for different gases. Causes of deviation from ideal behaviour, vander Waals equation of state (no derivation) and application in explaining real gas behaviour. Critical phenomena - Andrews isotherms of CO_2, critical constants and their calculation from van der Waals equation, Continuity of states, Law of corresponding states. Numerical problems. **Liquid State** **Surface Tension**: Definition and its determination using stalagmometer, effect of temperature and solute on surface tension **Viscosity**: Definition, Coefficient of viscosity. Determination of viscosity of a liquid using Oswald viscometer. Effect of temperature, size, weight, shape of molecules and intermolecular forces. **Refraction**: Specific and molar refraction- definition and advantages. Determination of refractive index by Abbes Refractometer. Additive and constitutive properties. **Parachor:** Definition, Atomic and structure parachor, Elucidation of structure of benzene and benzoquinone. Viscosity and molecular structure. Molar refraction and chemical constitution. Numerical Problems.	

Unit - 4	14 Hrs
Dilute solutions- Review of colligative properties and concentration terms Determination of molecular mass of a solute by: (i) Berkeley-Hartley's method ; (ii) Beckmann's method (ΔT^f) and (iii) Landsberger's method. Numerical problems **Distribution Law** Nernst Distribution Law – Statement. Distribution constant, factors affecting distribution constant, validity of Distribution Law, Modification of distribution law when molecules undergo a) Association b) Dissociation. Application of Distribution Law in Solvent extraction, numerical Problems **Solids** **Forms of solids:** Unit cell and space lattice, anisotropy of crystals, size and shape of crystals. Laws of Crystallography: Law of constancy of interfacial angles, Law of rational indices, Law of symmetry (Symmetry elements), Crystal systems, Bravais lattice types and identification of lattice planes. Miller indices and its calculation, X–Ray diffraction by crystals: Bragg's law and derivation of Bragg's equation, Single crystal and powder diffraction methods. Defects in crystals, glasses and liquid crystals. Numerical problems.	

Text Books

1. Concise Inorganic Chemistry: J D Lee, 4th Edn, Wiley, (2021)
2. Atkins Physical Chemistry.8th Edition. Peter Atkins & Julio De Paula Oxford University Press.
3. Principles of Physical Chemistry, Puri, Sharma & Pathania, Vishal Publishing Co.
4. Advanced Physical Chemistry, Gurdeep Raj, Goel Publishing House (2018)

References

1. Basic Inorganic Chemistry, F A Cotton, G Wilkinson and P. L. Gaus, 3rd Edition. Wiley. India
2. Physical Chemistry by Samuel Glasstone, ELBS (1982).
3. A Text Book of Physical Chemistry P.L.Soni , O.P. Dharmarhaand and U.N.Dash, Sultan Chand and Sons.

Pedagogy :

Chalk and Talk, ICT Tools and Models

Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Formative Assessment/ IA	40
Summative Assessment/ESE	60
Total	100

DSC LAB-2 Inorganic and Physical Practicals

Course Outcome:

After studying the course the student will be able to

1. Inculcate the significance of physical constants organic liquids
2. Weigh accurately compounds up to fourth decimal
3. Know the importance of calibration of instruments, pipette, burette and volumetric flask
4. Understand the concept of distribution coefficient, Nernst Distribution law, and how it takes different form when solute undergo association or dissociation in one of the layer
5. Prepare standard/working solutions, standardization of solutions and determination of the respective analytes
6. Handle proficiently byproducts and disposal of waste
7. Learn the importance of green methods over conventional methods.
8. Enthuse students to conduct experiments by arousing the curiosity which would help them in learning basics and advanced concepts through simulation-based labs

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Programme Outcomes (POs 1-8)

Course Outcomes (COs) / Programme Outcomes (POs)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1.Inculcate the significance of physical constants organic liquids	X	X						
2,Weigh accurately compounds up to fourth decimal		X						X
3,Know the importance of calibration of instruments, pipette, burette and volumetric flask		X		X				
4.Understand the concept of distribution coefficient, Nernst Distribution law, and how it takes different form when solute undergo association or dissociation in one of the layer		X			X			X
5.Prepare standard/working solutions, standardization of solutions and determination of the respective analytes		X			X			
6.Handle proficiently byproducts and disposal of waste						X	X	
7.Learn the importance of green methods over conventional methods.						X	X	X
8.Enthuse students to conduct experiments by arousing the curiosity which would help them in learning basics and advanced concepts through simulation-based labs		X			X		X	

Course Articulation Matrix relates course outcomes of course with the corresponding programme outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular programme outcome.

Number of practical Credits	Number of practical hours per semester
2	**56**

Tutorials
Green Principles to be adopted in the laboratories
Specific arrangements to be made for disposal of chemicals and solutions after the experiments
Calibration of instruments, glasswares etc to be performed in the beginning of the experiments
Preparation of Standard solution along with calculations to be taught
Handling and dilution of mineral acids to be emphasized
Selection and usage of Indicators to be explained

List of Experiments to be conducted

PART-A Inorganic Chemistry

TITRIMETRY

1. Determination of carbonate and hydroxide present in a mixture.
2. Determination of oxalic acid and sodium oxalate in a given mixture using standard $KMnO_4$/NaOH solution
3. Standardization of potassium permanganate solution and determination of nitrite in a water sample
4. Determination of alkali content in antacids
5. Determination of chlorine in bleaching powder using iodometric method.

Virtual Experiments

6. Determination of concentration of Potassium Permanganate solution using Ferrous Ammonium sulphate
7. Standardization of silver nitrate and determination of chloride in a water sample
8. Soil Analysis-Determination of pH of soil.

PART-B Physical Chemistry

1. Determination of density using specific gravity bottle and viscosity of liquids using Ostwald's viscometer (ethyl acetate, toluene, chlorobenzene or any other non-hazardous liquids)
2. Study of the variation of viscosity of sucrose solution with the concentration of a solute
3. Determination of the density using specific gravity bottle and surface tension of liquids using Stalagmometer (ethyl acetate, toluene, chlorobenzene or any other non-hazardous liquids)
4. Study of variation of surface tension of detergent solution with concentration.
5. Determination of molar mass of non-electrolyte by Walker-Lumsden method
6. Determination of partition/distribution coefficient of Benzoic acid in water and toluene
7. Determination of compositionof liquid mixtures by refractometry. (toluene and alcohol, water and sucrose)
8. Determination of specific and molar refraction by Abbes refractometer (ethyl acetate, methyl acetate, ethylene dichloride)

Virtual Experiments

9. Determination of molar mass of a non-volatile solute by cryoscopic method
10. Determination of viscosity by average molecular weight of a polymer
11. Determination of partition co-efficient of Iodine between water and carbon tetrachloride

Note:

1. Questions from both sections should be given in each batch.
2. In the first 20 minutes the Teacher should discuss in detail the theory, principle, procedure and calculations
3. Instructions to be given for operating instruments, weighing chemicals and precautions while handling chemicals
4. The last 20 minutes the teacher is expected to solve related problems based on the experiments.

Title of the Course: OE – 2: Molecules of Life

Course Outcome:

After studying the course the student will be able to

1. Know about the biological importance of biomolecules
2. Learn about the structure of amino acids and proteins.
3. Understand the correlation of enzyme function with drug action
4. Learn the classification and clinical significance of lipids
5. Know about the concepts of bioenergetics

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Programme Outcomes (POs 1-8)

Course Outcomes (COs) / Programme Outcomes (POs)	1	2	3	4	5	6	7	8
1.Know about the biological importance of biomolecules	X					X		
2.Learn about the structure of amino acids and proteins	X							
3.Understand the correlation of enzyme function with drug action			X				X	
4.Learn the classification and clinical significance of lipids	X			X				X
5.Know about the concepts of bioenergetics			X			X		

Course Articulation Matrix relates course outcomes of course with the corresponding programme outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular programme outcome.

Number of Theory Credits	Number of lecture hours per semester
3	**42**

Content of Theory Course 2	42 Hrs
Unit – 1	14 Hrs
Carbohydrates Classification of carbohydrates, reducing and non-reducing sugars, General properties of glucose and fructose, their open chain structures. Epimers, mutarotation and anomers. Linkage between monosaccharides, structure of disaccharides (sucrose, maltose, lactose) and polysaccharides (starch and cellulose) excluding their structure elucidation. Carbohydrates as a source of energy **Amino Acids, Peptides and Proteins** Classification ofamino acids, Zwitterions structure and Isoelectric point. Peptides: structure and conformation, example and function of biologically important Peptides. Proteins: Classification based on composition, shape and function with examples. Overview of Primary, Secondary, Tertiary and Quaternary structure of proteins. Importance of primary structure by taking sickle cell anemia as example. Determination of primary structure of peptides. Denaturation of proteins:, Renaturation of proteins.	
Unit - 2	14 Hrs

Enzymes and correlation with drug action Brief introduction, Nomenclature (E.C. No. upto 2nd digit) and classification of enzymes, Effect of pH and temperature. Enzyme specificity and theories-Lock and key model, induced fit theory. Active site and its characteristics, Mechanism of enzyme action, factors affecting enzyme action, Co-enzymes and cofactors and their role in biological reactions, Specificity of enzyme action (including stereo specificity), Enzyme inhibitors and their importance, phenomenon of inhibition (Competitive and Noncompetitive inhibition including allosteric inhibition). **Drug action-**receptor theory. Structure–activity relationships of drug molecules, binding role of –OH group, -NH_2 group, double bond and aromatic ring. **Lipids** Introduction to lipids, classification. Biological importance of triglycerides, phospholipids, glycolipids, and steroids (cholesterol).Oils and fats: Common fatty acids present in oils and fats, Omega fatty acids, Trans fats,Hydrogenation, Rancidity of oils. Triglycerides:: Biological importance of triglycerides. Saponification, saponification value and its significance, Unsaturation in acyl glycerols- iodine number and iodine number of different oils.Prostaglandins: definition and example, biological role of prostaglandins in general, Waxes: definition, types, biological importance. Lipoproteins: Types and functions, clinical significance.	
Unit - 3	14Hrs
Nucleic Acids Components of nucleic acids: Adenine, guanine, thymine and cytosine (Structure only), other components of nucleic acids, Nucleosides and nucleotides **(nomenclature**), Structure of polynucleotides; Structure of DNA (Watson-Crick model) and RNA (**types of RNA**), Genetic Code, -(general features and about Central dogma of Molecular biology) Biological roles of DNA and RNA: Replication, Transcription and Translation. Physico- chemical properties of nucleic acids - effect of alkali, acid and heat (denaturation and renaturation), Mutation Mutagens- chemical and physical, Molecular basis of mutation: spontaneous and induced mutations. Types of mutation, **Concept of Energy in Bio systems** Calorific value of food. Standard caloric content of carbohydrates, proteins and fats. Oxidation of foodstuff (organic molecules) as a source of energy for cells. Introduction to Metabolism (catabolism, anabolism), ATP: the universal currency of cellular energy, ATP hydrolysis and free energy change. Conversion of food into energy. Outline of catabolic pathways of Carbohydrate- Glycolysis, Fermentation, and Krebs Cycle. Overview of catabolic pathways of Fats and Proteins. Interrelationships in the metabolic pathways of Proteins, Fats and Carbohydrates. Introduction to bioenergetics, stages of energy transformation- Photosynthesis respiration and utilization of energy. Exergonic and endergonic reactions. standard free energy change.	

Text Books

1.Morrison, R. T. & Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).

2.A Text Book ofBioChemistry, V. S. S. Rama Rao, UBSPD,1998.

References

1.Concise Text Book ofBioChemistry,T. N. Pattabhiraman, All India Publishers, 2000.
2.W. H. Freeman. Berg, J.M., Tymoczko, J.L. & Stryer, L. *BioChemistry*, , 2002.

Pedagogy :

Chalk and Talk, ICT Tools and Models

Assessment	
Assessment Occasion/ type	**Weightage in Marks**
Formative Assessment/ IA	40
Summative Assessment/ESE	60
Total	100

Question paper pattern (Theory)

Time: 3 hours **Max. Marks: 60**

Instructions:

i) The question paper has two parts Answer both the parts

ii) Draw diagrams and write chemical equations wherever necessary.

Part A

Answer any FOUR of the following questions.

Each question carries TWO marks (4 X 2 = 8 Marks)

1.
2.
3.
4.
5.
6.

Part B

Answer any FOUR of the following questions.

Each question carries FIVE marks (4 X 5 = 20 Marks)

7.
8.
9.
10.
11.
12.

Part C

Answer any FOUR of the following questions.

Each question carries EIGHT marks (4 X 8 = 32 Marks)

13.
14.
15.
16.
17.
18.

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004

SURANA COLLEGE (AUTONOMOUS)

DEPARTMENT OF PHYSICS

NEP 2020

Syllabus for physics

Detailed Syllabus for 1 st & 2nd Semesters

1 st Semester

Phy-DSCT1: Mechanics and Properties of Matter Course Credits (L+T+P) : 4+0+0

Total Contact Hours: 52 Duration of ESA: 3 hours Course Outcomes (COs):

1. Fixing units, tabulation of observations, analysis of data (graphical/analytical).

2. Accuracy of measurement and sources of errors, importance of significant figures.

3. Knowledge of how g can be determined experimentally and derive satisfaction.

4. Understanding the difference between simple and torsional pendulum and their use in the determination of various physical parameters.

5. Knowledge of how various elastic moduli can be determined.

6. Measuring surface tension and viscosity and appreciate the methods adopted.

7. Hands on experience of different equipments.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)
Course Outcomes (COs) / Program Outcomes (POs)

1 2 3 4 5 6 Fixing units, tabulation of observations, analysis of data (graphical/analytical) X
Accuracy of measurement and sources of errors, importance of significant figures X
Knowledge of how g can be determined experimentally and derive satisfaction. X
Understanding the difference between simple and torsional pendulum and their use in the determination of various physical parameters X
Knowledge of how various elastic moduli can be determined X
Measuring surface tension and viscosity and appreciate the methods adopted X
Hands on experience of different equipments. X
Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular program outcome.

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road
Bangalore - 560 004

SURANA COLLEGE

#16, Southend road,Bangalore-04
(AUTONOMOUS)
BANGALORE UNIVERSITY
DEPARTMENT OF PHYSICS

BOARD OF STUDIES

22nd MARCH 2022

Sl.No	Name of Member	Signature
1.	**Dr .Madhavi .K.Y,Professor-University nominee** Govt First Grade College, Channapatna, BUB.	
2.	**Prof.Ashoka T N (Subject Expert)** (GFGC Vijayanagar)	
3.	**Prof. Nanjundaiah (Subject Expert)** Rural college, Kanakapura	
4.	**Prof.Srinivasa .S (Chairman)** Surana college, Southend road, Bangalore-04	22/03/22
5.	**Sagar.R-Industry Representative** Technical Manager, TATA Capitol	
6.	**Harshitha.V-Alumni Nominee** Software Automation tester, SLK software Ltd	

SURANA COLLEGE (AUTONOMOUS)

DEPARTMENT OF PHYSICS

BOARD OF EXAMINERS (TENTATIVE LIST)

01	Mr.Srinivasa S	Chairman
02	Prof. Narendra. B V	Subject Expert
03	Prof. seetha Vasudevrao	Subject Expert
04	Prof. Lokesh (NMKRV college Autonomous)	Member
05	Prof. Rajeshwari (MES college, malleshwaram)	Member

Course Content Phy.DSCT1: Mechanics & Properties of Matter

Unit – 1 (13 hours of teaching includes 3 hours of activities)

Chapter No. 1

Units and measurements: System of units (CGS and SI), measurement of length, mass and time, dimensions of physical quantities, dimensional formulae. Minimum deviation, errors. **4 Hrs**

Chapter No. 2

Momentum and Energy: Work and energy, Conservation of linear momentum, Conservation of energy with examples, Motion of rockets **4Hrs**

Chapter No. 3

Special Theory of Relativity:

Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of velocities. **5Hrs**

Topics for Self-study

Variable mass problem & Rocket motion Twin paradox

Suggested Activities

Activity No. 1 i). Measure diameters of small balls of different size and estimate their volumes.

ii). Measure lengths of nails of different size.

iii). Measure volume of a liquid.

iv). Measure distances and put the result both in CGS and SI units in 2, 3 and 4 significant figures. Mention the precision of the measurement.

v). Estimate standard deviations wherever possible.

Activity No. 2 Understand conservation of energy in every day examples like i) What happens in solar energy conversion panels ii) Pushing an object on the table iii) Moving car hits a parked car causes parked car to move. In these cases, it is known that energy is conserved. How? Understand and verify if possible.

Unit – 2 (13 hours of teaching includes 3 hours of activities)

Chapter No. 4. Laws of Motion: Newton's Laws of motion, Dynamics of single particle and a system of particles, Centre of mass.
3Hrs

Chapter No. 5.

Dynamics of Rigid bodies: Rotational motion about an axis, Relation between torque and angular momentum, Rotational energy, Moment of inertia (M.I): M.I of a rectangular lamina and solid cylinders, Flywheel, Theory of compound pendulum and determination of g.
6Hrs

Chapter No. 6.

Gravitation: Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's laws (statements). Satellite in a circular orbit.
4 Hrs

Topics for self study

Geosynchronous orbits Basic idea of global positioning system (GPS). Suggested Activities

Activity No. 3

Moment of inertia is an abstract concept. It simply gives a measure of rotational inertia of a rigid body and it is proportional to the product of the square of radius, r of the body and its mass, m. Refer to different websites to construct and perform simple experiments to verify that M.I. Reference : www.khanacademy.org, www.pinterest.com, www.serc.cerleton.edn

Activity No. 4

Prepare suitable charts and give seminar talks in the class. Reference : Weblink/Youtube/Book

Unit – 3

(13 hours of teaching includes 3 hours of activities)

Chapter No. 7

Elasticity: Hooke's law - Stress-strain diagram, elastic moduli-relation between elastic constants, Poisson's Ratio-expression for Poisson's ratio in terms of elastic constants. Work done in stretching and work done in twisting a wire-Twisting couple on a cylinder. Beams, bending of beams, expression for bending moment, theory of single cantilever. Torsional pendulum, expression for time-period of torsional oscillations, determination of rigidity modulus (static and dynamic methods) and moment of inertia, determination of q, η and σ by Searle's double bar with necessary theory. **13Hrs**

Topics for self study

Time period of oscillations of a spring-mass system with non-negligible mass of the spring.

Suggested Activities

Activity No. 5

Arrange a steel spring with its top fixed with a rigid support on a wall and a meter scale along side. Add 100 g load at a time on the bottom of the hanger in steps. This means that while putting each 100g load, we are increasing the stretching force by 1N. Measure the extension for loads up to 500g. Plot a graph of extension versus load. Shape of the graph should be a straight line indicating that the ratio of load to extension is constant. Go for higher loads and find out elastic limit of the material.

Reference : Weblink/Youtube/Book

Activity No.6

Repeat the above experiment with rubber and other materials and find out what happens after exceeding elastic limit. Plot and interpret.

Reference : Weblink/Youtube/Book

Unit – 4

Chapter No. 8

Surface tension: Definition of surface tension. Surface energy, relation between surface tension and surface energy, pressure difference across curved surface example, excess pressure inside spherical liquid drop, angle of contact. **7 Hrs**

Chapter No. 9

Topics to be covered:

Viscosity: Streamline flow, turbulent flow, equation of continuity, determination of coefficient of viscosity by Poisulle's method, Stoke's method. Problems **6 Hrs**

Topics for self study

Capillarity determination of surface tension by drop weight method.

Suggested Activities

Activity No.7

Measure surface tension of water and other common liquids and compare and learn

i) Why water has high ST? think of reasons. ii) Check whether ST is a function of temperature?

You can do it by heating the water to different temperatures and measure ST. iii) Plot ST versus T and learn how it behaves.

Mix some quantity of kerosene or any oil to water and measure ST. Check whether ST for the mixture is more or less than pure water. Think of reasons.

Activity No. 8

Collect a set of different liquids and measure their viscosity.

i) Find out whether sticky or non sticky liquids are most viscous. Think of reasons.

ii) Mix non sticky liquid to the sticky liquid in defined quantities and measure viscosity. Find

out viscosity is increasing or decreasing with increase of non-sticky liquid concentration.

iii) Do the above experiment by mixing sticky liquid to the non sticky liquid. Find out change in viscosity with increase of concentration of sticky liquid.Think why anyone should know viscosity of a liquid.

Paper Code: Phy-DSCP1 - Lab I (2 credits, 4 hours per week) List of Experiments to be performed in Lab I

1. Determination of g using bar pendulum (L versus T and L versus LT2 graphs)

2. Determination of moment of inertia of a Fly Wheel.

3. Determination of rigidity modulus using torsional pendulum

4. Verification of parallel and perpendicular axis theorems.

5. Determine the Young's Modulus a bar by uniform bending method

6. Determination of elastic constants of a wire by Searle's method

7. Young's modulus by Koenig's method

8. Modulus of rigidity of a rod –Static torsion method.

9. Viscosity by Stokes method

10. Radius of capillary tube by mercury pellet method

11. Verification of Hook's law.

12. Determination of surface tension of a liquid and the interfacial tension between two liquids using drop weight method.

13. Critical pressure for stream line flow

14. Determine the Young's Modulus a bar by single cantilever method.

15. Study of motion of a spring and to calculate Spring constant, g and unknown mass.

Note: A minimum of EIGHT experiments to be carried out

Course Content: 2 nd Semester Phy-DSCT2: Electricity and Magnetism Course Credits (L+T+P) : 4+0+0=4 Total Contact Hours: 52 Duration of ESA: 3 hours Course Outcomes (COs):

1. Demonstrate Gauss law, Coulomb's law for the electric field, and apply it to systems of point charges as well as line, surface, and volume distributions of charges.

2. Explain and differentiate the vector (electric fields, Coulomb's law) and scalar (electric potential, electric potential energy) formalisms of electrostatics.

3. Apply Gauss's law of electrostatics to solve a variety of problems.

4. Describe the magnetic field produced by magnetic dipoles and electric currents.

5. Explain Faraday-Lenz and Maxwell laws to articulate the relationship between electric and magnetic fields.

6. Describe how magnetism is produced and list examples where its effects are observed.

7. Apply Kirchhoff's rules to analyze AC circuits consisting of parallel and/or series combinations of voltage sources and resistors and to describe the graphical relationship of resistance, capacitor and inductor.

8. Apply various network theorems such as Superposition, Thevenin, Norton, Reciprocity,• Maximum Power Transfer, etc. and their applications in electronics, electrical circuit analysis, and electrical machines.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs) Course Outcomes (COs) / Program Outcomes (POs) 1 2 3 4 5 6

Demonstrate Gauss law, Coulomb's law for the electric field, and apply it to systems of point, line, surface, and volume distributions of charges. x x

Explain and differentiate the vector (electric fields, Coulomb's law) and scalar (electric potential, electric potential energy) formalisms of electrostatics. x

Apply Gauss's law of electrostatics to solve a variety of problems. x x x

Describe the magnetic field produced by magnetic dipoles and electric currents. x

Explain Faraday-Lenz and Maxwell laws to articulate the relationship between electric and magnetic fields. x Describe how magnetism is produced and list examples where its effects are observed. x x x

Apply Kirchhoff's rules to analyze AC circuits consisting of parallel and/or series combinations of voltage sources and resistors and to describe the graphical relationship of resistance, capacitor and inductor. x x x x

Apply various network theorems such as Superposition, Thevenin, Norton, Reciprocity,• Maximum Power Transfer, etc. and their applications in electronics, electrical circuit analysis, and electrical machines. x x x x

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular program outcome

Course Content Phy-DSCT2:Electricity and Magnetism Unit – 1 (13 hours of teaching includes 3 hours of activities)

Chapter No. 1

Electric charge and field: Coulomb's law, electric field strength, electric field lines, point charge in an electric field and electric dipole, work done by a charge (derivation of the expression for potential energy) **3Hrs**

Chapter No. 2

Gauss law: Gauss's law and its applications - electric fields of a (i) spherical charge distribution, (ii) line charge and (iii) an infinite flat sheet of charge.
3Hrs

Chapter No. 3

Electrostatic potential Electric potential, line integral, gradient of a scalar function, relation between field and potential. Potential due to point charge and distribution of charges C **7Hrs**

Topics for self study

Concept of Voltage and Current Sources, Kirchhoff's Laws

Suggested Activities

Activity No. 1

(i) Learn the difference between and DC and AC electricity and their characteristics.
(ii) Voltage and line frequency standards in different countries.
(iii) A small project report on production of electricity as a source of energy: Different methods **Reference :** Weblink/Youtube/Book
(iv) **Activity No. 2**
(i) Learn to use a multimeter (analog and digital) to measure voltage, current and resistance. Continuity testing of a wire. (ii) Learn about household electrical connection terminals: Live, neutral and ground and voltage between the terminals. Role of earthing and safety measures **Reference :** Weblink/Youtube/Book

Unit – 2 (13 hours of teaching includes 3 hours of activities)

Chapter No. 4.

Conductors in electrostatic field: Conductors and insulators, conductors in electric field. Capacitance and capacitors, expression for capacitance in a parallel plate capacitor, parallel plate capacitor with dielectric, Dielectrics: an atomic view. Energy stored in a capacitor, Dielectric and Gauss's law.
6Hrs

Chapter No. 5

DC currents: Electric currents and current density. Electrical conductivity and Ohm's law. Physics of electrical conduction, conduction in metals and semiconductors, circuit elements and circuits: Transient currents in RC, LR and LCR circuits. Force on a moving charge.
7Hrs

Topics for self study

Currents and voltage in combination of R, L and C circuits

Suggested Activities Activity No. 3 (i) Learn about electrical appliances which work with AC and DC supply. (ii) Learn about types of resistors and their colour codes and types of capacitors (electrolytic and nonelectrolytic)

Reference : Weblink/Youtube/Book Activity No. 4 (i) Learn about power transmission: 3-phase electricity, voltage and phase (ii) Visit a nearby electrical power station. Interact with line men, Electrical engineers and managers. Discuss about power loss in transmission. How to reduce it? (iii) Prepare a small project report on street lighting and types of electrical bulbs.

Reference : Weblink/Youtube/Book

Unit – 3 (13 hours of teaching includes 3 hours of activities)

Chapter No.6

Magnetism: Definition of magnetic field, Ampere's law and Biot-Savart law (magnetic force and magnetic flux), Magnetic force on a current carrying conductor, Hall effect in a conductor. Electromagnetic induction, conducting rod moving in a magnetic field, Faraday's laws of induction, Lenz's Law, expression for self-inductance and energy stored in a magnetic field. Mutual inductance.

Chapter No. 7 **7Hrs**

AC circuits: RMS and average value of AC, Response of series RL, RC, LC, LCR circuits using j-operator method, quality factor, admittance and impedance, power and energy in AC circuits. **6Hrs**

Topics for self study

Response of parallel RL, RC, LC, LCR circuits using joperator method

Suggested Activities Activity No. 5 (i) Prepare a small project report on street lighting and types of electrical bulbs. (ii) Learn the measurement of electric current using tangent galvanometer.

Reference : Weblink/Youtube/Book Activity No.6 Build a small coil with insulated copper wire. Connect an ammeter micro/milli ammeter. Verify magnetic induction using a powerful bar magnet. Reference : Weblink/Youtube/Book

Unit – 4

Scalar and vector fields :
Gradient of a scalar function (use of del operator), Divergence and Curl product rules (explanation with geometrical representation), Line, surface and volume integrals (explanation with examples), Fundamental theorem for divergence and curl (statements only). **3Hrs**

ELECTROMAGNETIC WAVES :
Equation of Continuity, Displacement Current, Maxwell's equations in differential form (Derivation and physical significance), Derivation of wave equation (for one dimension), Velocity of em waves in free space and isotropic dielectric medium(derivation), Relation between refractive index and permittivity (qualitatively), Transverse nature of Plane em waves, , Poynting Vector, Energy density in electromagnetic field, Momentum and Pressure of em waves (derivation), Electromagnetic waves in a conducting medium – skin effect and skin depth

10Hrs

Paper Code: Phy-DSCP1-Lab II (2 credits / 4 hours per week) List of Experiments to be performed in Lab II

1. Experiments on tracing of electric and magnetic flux lines for standard configuration.

2. Determination of components of earth's magnetic field using a Ballistic galvanometer.

3. Determination of capacitance of a condenser using B.G.

4. Determination of high resistance by leakage using B.G.

5. Determination of mutual inductance using BG.

6. Charging and discharging of a capacitor (energy dissipated during charging and time constant measurements).

7. Frequency response of LCR Series resonance circuit.

8. Frequency response of LCR Parallel resonance circuit.

9. Impedance of series RC circuits - determination of frequency of AC. 10. Study the i-v characteristics of a series RC and RL Circuit.

11. Determination of self-inductance of a coil.

12. Verification of laws of combination of capacitances and determination of unknown capacitance using de-Sauty bridge.

13. Maxwell's impedance bridge to determine L.

14. Determination of BH using Helmholtz double coil galvanometer and potentiometer.

Note: A minimum of EIGHT experiments to be performed.

Open Elective Papers Phy-OE1: Energy Sources (Credits:3) 3 hours of teaching per week

Unit-I: Non-Renewable energy sources Introduction: Energy concept-sources in general, its significance & necessity, Classification of energy sources: Primary and Secondary energy, Commercial and Non-commercial energy, Renewable and Non-renewable energy, Conventional and Non-conventional energy, Based on Origin-Examples and limitations. Importance of Non-commercial energy resources (5 hours)

Conventional energy sources: Fossil fuels & Nuclear energy- production & extraction, usage rate and limitations. Impact on environment and their issues & challenges. Overview of Indian & world energy scenario with latest statistics- consumption & necessity. Need of eco-friendly & green energy & their related technology. (8 hours)
13Hrs

Unit-II: Renewable energy sources Introduction:

Need of renewable energy, non-conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, geothermal energy tidal energy, Hydroelectricity. (05 hours)

Solar energy: Solar Energy-Key features, its importance, Merits & demerits of solar energy, Applications of solar energy. Solar water heater, flat plate collector, solar distillation, solar cooker, solar green houses, solar cell -brief discussion of each. Need and characteristics of photovoltaic (PV)

systems, PV models and equivalent circuits, and sun tracking systems. (8 hours)
13Hrs

Unit-III Wind and Tidal Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies, Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices, Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy. (8 hours) Geothermal and hydro energy: Geothermal Resources, Geothermal Technologies (2 hours), Hydropower resources, hydropower technologies, environmental impact of hydro power sources, Carbon captured technologies, cell, batteries, power consumption (3 hour)
13Hrs

Suggested Activities

1. Demonstration of on Solar energy, wind energy, etc, using training modules at Labs.
2. Conversion of vibration to voltage using piezoelectric materials.
3. Conversion of thermal energy into voltage using thermoelectric (using thermocouples or heat sensors) modules.
4. Project report on Solar energy scenario in India
5. Project report on Hydro energy scenario in India
6. Project report on wind energy scenario in India
7. Field trip to nearby Hydroelectric stations.
8. Field trip to nearby to wind energy stations.
9. Field trip to nearby to solar energy parks.
10. Videos on solar energy, hydro energy and wind energy.

Reference Books 1. Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi

2. Solar energy - M P Agarwal - S Chand and Co. Ltd.

3. Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd.

4. Godfrey Boyle, “Renewable Energy, Power for a sustainable future”, 2004, Oxford University Press, in association with The Open University.

5. Dr. P Jayakumar, Solar Energy: Resource Assessment Handbook, 2009

6. J.Balfour, M.Shaw and S. Jarosek, Photovoltaics, Lawrence J Goodrich (USA).

7. http://en.wikipedia.org/wiki/Renewable_energy

Phy-OE2: Physics for all (Credits:3) 3 hours of teaching per week

Unit-I Energy and Power: Explosions and energy; Energy, heat and its units; Energy table and discussions; Discussion of cost of energy; Measuring energy; Power; Different power sources; Kinetic energy.
13Hrs

Unit-II Gravity, Force and Space: The force of Gravity; Newton’s third law; Weightlessness; Low earth orbit; Geosynchronous satellites; Spy satellites; Medium Earth Orbit satellite; Circular

Acceleration; momentum; Rockets; Airplanes, helicopters and fans; Hot air and helium balloons; angular momentum and torque.. **13Hrs**

Unit-III Nuclei and radioactivity: Radioactivity; Elements and isotopes; Radiation and rays; Seeing radiation; The REM – The radiation poisoning; Radiation and cancer; The linear hypothesis; Different types of radiation; The half-life rule; Smoke detectors; measuring age from radioactivity; Environmental radioactivity; Glow of radioactivity; Nuclear fusion.
13Hrs

References Book

This course is extracted from the book titled "Physics and Technology for Future Presidents: An Introduction to the Essential Physics Every World Leader Needs to Know" by Richard A Muller, WW Norton and Company, 2007. (Units 1 to 3 are from chapters 1, 3, 4 respectively).

Phy-OE3: Atmospheric Science (Credits:3) 3 hours of teaching per week

Unit-I Atmosphere: Atmospheric Science (Meteorology) as a multidisciplinary science. Physical and dynamic meteorology, Some terminology, difference between weather and climate, weather and climate variables, composition of the present atmosphere: fixed and variable gases, volume mixing ratio (VMR), sources and sinks of gases in the atmosphere. Green house gases. Structure (layers) of the atmosphere. Temperature variation in the atmosphere, temperature lapse rate, mass, pressure and density variation in the atmosphere. Distribution of winds.
13Hrs

Unit-II Climate Science: Overview of meteorological observations, measurement of : temperature, humidity, wind speed and direction and pressure. Surface weather stations, upper air observational network, satellite observation. Overview of clouds and precipitation, aerosol size and concentration, nucleation, droplet growth and condensation (qualitative description). Cloud seeding, lightning and discharge. Formation of trade winds, cyclones. Modelling of the atmosphere: General principles, Overview of General Circulation Models(GCM) for weather forecasting and prediction. Limitations of the models. R and D institutions in India and abroad dedicated to climate Science, NARL, IITM, CSIR Centre for Mathematical Modeling and Computer Simulation, and many more. **13Hrs**

Unit-III Global Climate Change: Green house effect and global warming, Enhancement in concentration of carbon dioxide and other green house gases in the atmosphere, Conventional and non-conventional energy sources and their usage. EL Nino/LA Nino Southern oscillations. Causes for global warming: Deforestation, fossil fuel burning, industrialization. Manifestations of global warming: Sea level rise, melting of glaciers, variation in monsoon patterns, increase in frequency and intensity of cyclones, hurricanes, tornadoes. Geo-engineering as a tool to mitigate global warming, Schemes of geo-engineering.
13Hrs

Suggested Activities

1. Try to find answer to the following questions: (a) Imagine you are going in a aircraft at an altitude greater than 100 km. The air temperature at that altitude will be greater than 200oC. If you put your hands out of the window of the aircraft, you will not feel hot. (b) What would have happened if ozone is not present in the stratosphere.

2. Visit a nearby weather Station and learn about their activities.

3. Design your own rain gauge for rainfall measurement at your place.

4. Learn to determine atmospheric humidity using wet bulb and dry bulb thermometers.

5. Visit the website of Indian Institute of Tropical Meteorology (IITM), and keep track of occurrence and land fall of cyclone prediction.

6. Learn about ozone layer and its depletion and ozone hole.

7. Keep track of melting of glaciers in the Arctic and Atlantic region through data base available over several decades.

8. Watch documentary films on global warming and related issues (produced by amateur film makers and promoted by British Council and BBC).

Reference Books

1. Basics of Atmospheric Science – A Chndrashekar, PHI Learning Private Ltd. New Delhi, 2010.

2. Fundamentals of Atmospheric Modelling- Mark Z Jacbson, Cambridge University Press, 2000.

Phy-OE4: Sports Science (Credits:3) 3 hours of teaching per week

Unit-I Measurement: Physical quantities, Standards and Units, International system of Units, Standards of time, length and mass, Precision and significant figures (4 hours)

Newton's laws of motion: Newton's first law. Force, mass. Newton's second law. Newton's third law, Mass and weight. Applications of Newton's laws. (5 hours)

Projectile motion: Shooting a falling target, Physics behind Shooting, Javelin throw and Discus throw. (4 hours)

Topics for self study: https://www.real-world-physics-problems.com/physics-of sports.html

13Hrs

Unit-II Conservation laws: Conservation of linear momentum, collisions – elastic and inelastic. Angular momentum. (Physics behind Carom, Billiards, Racing) (4 hours)

Centre of mass: Physics behind Cycling, Rock climbing, Skating (5 hours) Gravitation: Origin, Newton's law of gravitation, Archimedes's principle, Buoyancy & Physics behind swimming (4 hours) **Topic for self-study:** Archimedes' Principle: Made EASY | Physics in You tube 13 Unit-III Food and Nutrition: Proteins, Vitamins, Fat, Blood pressure. Problems due to the deficiency of vitamins. (4 hours)

Energy: Different forms of Energy, Conservation of mass-energy (3 hours)

Physical exercises: Walking, Jogging and Running, Weight management. (3 hours)

Topic for self-study: 10 Best Exercises for Everyone – Healthline **13Hrs**

Suggested Activities

1. Identify the methods of measurement of time, length and mass from ancient time and build models for them. (Reference : History of measurement - Wikipedia https://en.wikipedia.org › wiki › History_of_measurement)

2. Identify Physics principles behind various Sports activities. https://www.real-world-physics-problems.com/physics-of-sports.html

3. List the difficulties experienced in Gymnastics, Cycling and Weight lifting.

4. List the difficulties experienced in swimming.

5. Learn breathing exercises.

6. Write an essay on Physical health v/s Mental health or conduct a debate on Physical health v/s Mental health.

Text Books

1. Yakov Perelman. Physics for Entertainment. Createspace Independent Pub, 2010.

2. Yakov Perelman. Physics Everywhere. Prodinnova Publishers, 2014.

3. Yakov Perelman. Mechanics for Entertainment. Prodinnova Publishers, 2014.

4. Vassilios McInnes Spathopoulos. An Introduction to the Physics of Sports. Createspace Independent Publishing Platform, 2013.

5. Walter Lewin. For the Love of Physics. Taxmann Publications Pvt. Ltd., 2012.

6. Swaminathan M. Handbook of Food and Nutrition. Bangalore Press. 2012.

7. Srilakshmi B. Food Science. New Age International Pub. 2015.

Internet Resources for Reference: Internet resources

https://www.topendsports.com/biomechanics/physics.htm

https://www.real-world-physics-problems.com/physics-of-sports.html

https://www.healthline.com/

https://www.mayoclinic.org/

https://www.who.int/news-room/

BANGALORE UNIVERSITY

Syllabus for B.Sc. Biotechnology (UG)

CHOICE BASED CREDIT SYSTEM (CBCS)
I & II Semester Biotechnology Papers

Under-Graduate (UG) Program
Framed According to the National Education Policy (NEP 2020)

From the academic year 2021-22

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

196

MODEL CURRICULUM

Name of the Degree Program: BSc (Basic/Hons.)
Discipline Core: Biotechnology
Total Credits for the Program: B.Sc. Basic - 136 and B.Sc. Hons. - 176
Starting year of implementation: 2021-22

Program Outcomes: Competencies need to be acquired by the candidate for securing B.Sc. (Basic) or B.Sc. (Hons)

Introduction:

The NEP-2020 offers an opportunity to effect paradigm shift from a teacher-centric to student-centric higher education system in India. It caters skill-based education where the graduate attributes are first kept in mind to reverse-design the programs, courses and supplementary activities to attain the graduate attributes and learning attributes. The learning outcomes-based curriculum framework for a degree in **B.Sc. (Honours) Biotechnology** is intended to provide a comprehensive foundation to the subject and to help students develop the ability to successfully continue with further studies and research in the subject while they are equipped with required skills at various stages. Effort has been made to integrate use of recent technology and use of MOOCs to assist teaching-learning process among students. The framework is designed to equip students with valuable cognitive abilities and skills so that they are successful in meeting diverse needs of professional careers in a developing and knowledge-based society. The curriculum framework considers the need to maintain globally competitive standards of achievement in terms of knowledge and skills in **Biotechnology** and allied courses, as well develop scientific orientation, spirit of enquiry, problem solving skills, human and professional values which foster rational and critical thinking in the students. This course serves a plethora of opportunities in different fields right from classical to applied aspects in **Biotechnology**.

GRADUATE ATTRIBUTES IN B.Sc. (Hons.) Biotechnology

Some of the characteristic attributes a graduate in **Biotechnology** should possess are:

- Disciplinary knowledge and skills
- Skilled communication
- Critical thinking and problem-solving capacity
- Logical thinking and reasoning
- Team Spirit & Leadership Quality
- Digital efficiency
- Ethical awareness / reasoning
- National and international perspective
- Lifelong learning

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road
Bangalore - 560 004

Flexibility:

- The programmes are flexible enough to allow liberty to students in designing them according to their requirements. Students may choose a single Major, one Major with a Minor, and one Major with two Minors. Teacher Education or Vocational courses may be chosen in place of Minor/s below listed are the various options students may choose from.

- One Major subject/discipline, Two Languages, Generic Electives, Ability Enhancement, Skill Development and Vocational courses including Extracurricular Activities.

- One Major and one Minor subject/discipline along with Languages, Generic Electives, Ability Enhancement, Skill Development and Vocational courses including Extracurricular Activities

- Two Major subject/disciplines along with Languages, Generic Electives, Ability Enhancement, Skill Development and Vocational courses, including Extracurricular Activities.

- One Major subject/discipline and one Vocational course along with Languages, Generic Electives, Ability Enhancement and Skill Development and courses including Extracurricular Activities.

- One Major Discipline and One Education Discipline along with Languages, Generic Electives, Ability Enhancement and Skill Development Courses including Extracurricular Activities.

By the end of the program the students will be able to:

- Understand concepts in Biotechnology and demonstrate interdisciplinary skills acquired in cell biology, genetics, biochemistry, microbiology and molecular biology.

- Demonstrate the laboratory skills in cell biology, basic and applied microbiology with an emphasis on technological aspects.

- Competent to apply the knowledge and skills gained in the fields of Plant biotechnology, animal biotechnology and microbial technology in pharma, food, agriculture, beverages, herbal and nutraceutical industries.

- Critically analyze the environmental issues and apply the knowledge gained in biotechnology for conserving the environment and resolving the problems.

- Demonstrate comprehensive innovations and skills in the field of biomolecules, cell biology molecular biology, bioprocess engineering and genetic engineering of plants, microbes, and animals with respect to applications for human welfare.

- Apply knowledge and skills of immunology, bioinformatics, computational modelling of proteins, drug design and simulations to test the models and aid in drug discovery.

- Critically analyze, interpret data, and apply tools of bioinformatics and multi omics in various sectors of biotechnology including health and food.

- Demonstrate communication skills, scientific writing, data collection and interpretation abilities in all the fields of Biotechnology.

- Learn and practice professional skills in handling microbes, animals and plants and demonstrate the ability to identify ethical issues related to recombinant DNA technology, genetic engineering, animal handling, intellectual property rights, biosafety, and biohazards.

- Explore the biotechnological practices and demonstrate innovative thinking in addressing the current day and future challenges with respect to food, health, and environment.

- Gain thorough knowledge and apply good laboratory and good manufacturing practices in biotech industries.

- Understand and apply molecular biology techniques and principles in forensic and clinical biotechnology.

- Demonstrate entrepreneurship abilities, innovative thinking, planning, and setting up of small-scale enterprises or CROs.

Assessment: Weightage for assessments

Type of Course	Formative Assessment / IA	Summative Assessment
Theory	40	60
Practical	25	25
Projects	40	60
Experiential Learning (Internships/MOOC/ Swayam etc.)	40	60

Progressive Certificate, Diploma, Bachelor's Degree or Bachelor's Degree with Honours provided at the end of each year of exit of the four-years Undergraduate Programme.

	EXIT OPTIONS	**Credits Required**
1.	**Certificate** upon the successful completion of the First Year (Two Semesters) of the multidisciplinary Four-years Undergraduate Programme/Five-years Integrated Master's Degree Programme.	44-48
2.	**Diploma** upon the successful completion of the Second Year (Four Semesters) of the multidisciplinary Four-years Undergraduate Programme/Five-years Integrated Master's Degree Programme.	88-96
3.	**Basic Bachelor's Degree** at the successful completion of the Third Year (Six Semesters) of the multidisciplinary Four-year Undergraduate Programme/Five-years Integrated Master's Degree Programme.	132-144
4.	**Bachelor's Degree with Honours** in a Discipline at the Successful Completion of the Fourth Year (Eight Semesters) of the multidisciplinary Four-years Undergraduate Programme/Five-years Integrated Master's Degree Programme	176-192

IIA. Model Program Structures for the Under-Graduate Programs in Bangalore University and its affiliated Colleges.

Biotechnology

Semester	Discipline Core (DSC) (Credits) (L+T+P)	Discipline Elective(DSE) / Open Elective (OE) (Credits) (L+T+P)	Ability Enhancement Compulsory Courses (AECC),Languages (Credits) (L+T+P)		Skill Enhancement Courses (SEC)		Total Credits
					Skill based (Credits) (L+T+P)	Value based (Credits) (L+T+P)	
I	DSC: T1 BTC 101 A1- Cell biology and Genetics (04) DSC-P1 BTC 101 Cell biology and Genetics (02)	OE-T1, BTC 301 Biotechnology for Human Welfare (03)	L1-1(3), L2-1(3) (4 hrs. each)		SEC-T1, BTC -701, Biotechnological Skills and Analytical Techniques (1+0+2)	Physical Education for Health &Wellness fitness (1)(0+0+2)(1) (0+0+2)	**25**
II	DSC-T2 BTC 102 A2- Microbiological Methods (04) DSC-P2 BTC 102 Microbiological Methods (02)	OE-T2, BTC 302 Applications of Biotechnology in Agriculture (03)	L1-2(3), L2-2(3) (4 hrs. each)	Environmental Studies (2)	---------	Physical Education - NCC/NSS/R&R (S&	**25**
Exit option with Certificate in Biotechnology (50 Credits)							

B.Sc. Biotechnology (Basic / Hons.), First Semester

Course Title: DSC-T1BTC101, Cell Biology and Genetics (A1)	
Course Code: **DSC-T1 BTC101**	L-T-P per week: 4-0-0
Total Contact Hours: **56**	Course Credits: 0**4**
Formative Assessment Marks: **40**	Duration of ESA/Exam: 0**3 h**
Model Syllabus Authors: **Curriculum Committee**	Summative Assessment Marks: **60**

Course Outcomes (COs): At the end of the course the students will be able to:

1. Understand concepts in Biotechnology and demonstrate knowledge acquired in interdisciplinary skills in cell biology and genetics
2. Comprehend the structure of a cell with its organelles
3. Understand the chromatin structure and its location
4. Understand the basic principles of life, and how a cell divides
5. Explain the organization of genes and chromosomes, chromosome morphology and its aberrations

Course Articulation Matrix: Mapping of Course Outcomes (Cos) with Program Outcomes (Pos 1-12)

Sl. No	Course Outcomes (COs) / Program Outcomes (POs)	T1	1	2	3	4	5	6	7	8	9	10	11
I	Core competency	X											
II	Critical thinking	X											
III	Analytical reasoning	X											
IV	Research skills	X											
V	Team work	X											

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark '✓' in the intersection cell if a course outcome addresses a particular program outcome.

B.Sc. Biotechnology (Basic / Hons.), First Semester

Content of Course 01: Theory: DSC-T1BTC101: Cell Biology and Genetics	**56 h**
Unit – 1: Cell and cellular organelles	**14 h**
Historical perspectives. Discovery of cell, the cell theory, ultrastructure of a eukaryotic cell- (both plant and animal cells), structural organization and functions of cell wall and plasma membrane. **Structure and functions of cell organelles:** Cytosol, endoplasmic reticulum, golgi complex, mitochondria, chloroplast, ribosomes, lysosomes, peroxisomes, nucleus, nucleolus, vacuole and cytoskeletal structures (microtubules, microfilaments and intermediate filaments).	
Unit – 2: Chromosomes and cell division	**14 h**
General introduction, discovery, morphology and structural organization – Centromere, secondary constriction, telomere, chromonema, euchromatin and heterochromatin, chemical composition and karyotype. Single-stranded and multi-stranded hypothesis, folded-fibre and nucleosome models. **Special type of chromosomes:** Salivary gland chromosome and lampbrush chromosmes. Cell cycle, phases of cell division, mitosis and meiosis, cell cycle checkpoints, enzymes involved in regulation, significance of cell cycle, achromatic apparatus, synaptonemal complex, senescence and programmed cell death.	
Unit – 3: Inheritance and gene interaction	**14 h**
History of genetics: Mendelian theory; Laws of inheritance - dominance, segregation, incomplete dominance, codominance with an example. Law of independent assortment, test cross, back cross and non-Mendelian inheritance. **Maternal inheritance:** Plastid inheritance in Mirabilis, Kappa particles in paramecium, and Petite characters in yeast, Sex-linked inheritance, Chromosome theory of inheritance. **Gene interaction:** Supplementary factors: comb pattern in fowls, Complementary genes – flower colour in sweet peas, Multiple factors – skin colour in human beings, Epistasis – plumage colour in poultry, Multiple allelism: blood groups in human beings.	
Unit – 4: Linkage and mutation	**14 h**
General introduction, coupling and repulsion hypothesis, linkage in maize and Drosophila, mechanism of crossing over and its importance, chromosome mapping-linkage map in maize. **Mutations:** Types of mutations; spontaneous and induced mutagens: Physical and chemical, mutation at the molecular level, mutations in plants, animals and microbes and its merits and demerits. Structural and numerical chromosomal aberrations. Sex determination in plants and animals. Concept of allosomes and autosomes, XX-XY, XX-XO, ZW-ZZ, ZO-ZZ types. Allosomal (Klinefelter syndrome and Turner's syndrome), autosomal (Down's syndrome and Cri-Du-Chat syndrome) conditions.	

Formative Assessment	
Pedagogy: Lectures, Presentations, videos, Assignments and Weekly Formative Assessment Tests.	
Assessment Occasion	**Weightage in marks**
Assignment/ Field Report/ Project	15 Marks
Test	20 Marks
Participation in class	05 marks
Total	**40 Marks**

Cell Biology and Genetics Laboratory Content

Course content 01: Practicals: DSC-P1BTC101: Cell Biology and Genetics

Course Title: **Cell Biology and Genetics**	Course Credits: **02**
Course Code: **DSC-P1BTC101**	L-T-P per week: 0-0-4
Total Contact Hours: **28**	Duration of ESA/Exam: 03 h
Formative Assessment Marks: **25**	Summative Assessment Marks: **25**

1. Operation and working principle of simple and compound microscope.
2. Use of Micrometry, measurement of onion epidermal cells and yeast.
3. Study of mitosis in onion root tips.
4. Study of meiosis in grasshopper testes/onion/Rhoeo flower buds.
5. Mounting of polytene chromosomes.
6. Buccal smear – Barr bodies.
7. Karyotype analysis – human (normal & abnormal) and onion.
8. Isolation and staining of mitochondria/chloroplast.
9. Enumeration of RBC using Haemocytometer.
10. Simple genetic problems based on theory.
11. Preparation and submission of 5 permanent slides of mitosis & meiosis (by each student).

Pedagogy: Lectures, Presentations, videos, Assignments and Weekly Formative Assessment Tests.

Formative Assessment	
Assessment Occasion	**Weightage in Marks**
Assignment/Monograph	10
Test	10
Participation in class	05
Total	**25**

Text Books/References

1. Ambrose, and Dorothy, M., Easty 1970. Cell Biology, ELBS Publications.
2. Benjamin Lewin, 1985. Genes II –Wiley & Sons Publications.
3. Benjamin Lewin, 1987. Genes III Wiley & Sons Publications.
4. Benjamin Lewin, 1994. Genes V. By Oxford University Press, Oxford and New York, 1,272 pp.

5. Bruce Alberts, Alexander Johnson, Julian Lewis, et al., 2014 Molecular Biology of Cell –Garland publications.
6. Daniel L. Hartl, E.W. Jones, Jones, 2005. Genetics: Analysis of Genes and Genomes, Barlett Publishers.
7. De Robertis and EMF Robertis, 1980. Cell Biology & Molecular Biology – EDP Saunder College.
8. Edgar Altenburg, 1970. Genetics, Oxford & IBH publications.
9. Gardener, E.J., Simmons M.J. and Snustad D.P. 1991. Principles of Genetics –John Wiley and Son Publications.
10. Gupta P.K., 2018-19. Genetics - 5th Revised Edition, Rastogi Publication, Meert, India.
11. Harvey Lodish, Arnold Berk, S Lawrence Zipursky, Paul Matsudaira, David Baltimore, and James Darnell. 2000. Molecular Cell Biology - Daniel, Scientific American Books.
12. Jack D Bruke. 2002. Cell Biology, The William Twilkins Company.
13. Monroe W Strickberger, 1976. Genetics, Macmillain Publishers, New York
14. Powar, C.B. 2019. Cell Biology, Himalaya Publications.
15. Sandy, B. Primrose, Richard Twyman, 2006. Principles of Gene Manipulations 7th Edition Black Well Scientific Publications.
16. Sharp, L.W. 1943. Fundamentals of Cytology - New York,McGraw-Hill Book Company, inc.
17. Sinnott, L.C. Dunn, Dobzhansky 1985. Principles of Genetics - McGraw-Hill.
18. White, M.J.D. 1980. Animal Cytology and Evolution, Cambridge University Publications.
19. Willson and Marrison, 1966. Cytology, Reinform Publications.

Content of Course 02: Theory: OE-T1 BTC301: Biotechnology for Human Welfare

Course Title: Biotechnology for Human Welfare	Course Credits: 03	
Course Code: OE-T1BTC301	L-T-P per week: 3-0-0	
Total Contact Hours: 42	Duration of ESA/Exam: 3 h	
Formative Assessment Marks: 30	Summative Assessment Marks: 45	
Unit – 1: Industry		**14 h**
Enzymes for textile industry, breweries, food supplements – single cell protein, vitamins, food processing - cheese, yoghurt making, biodegradable plastics, biofuels.		
Unit – 2: Environment		**14 h**
Applications of Biotechnology in environmental aspects: waste management, biodegradation of heavy metals, water cleaning, removing oil spills, air and soil pollution, bioremediation, biomining.		
Unit – 3: Human Health and livestock		**14 h**
Applications in Human Health: Antibiotic production, Molecular diagnostics, vaccines and vaccine delivery, recombinant therapeutics – insulin, gene therapy, forensics. **Applications in livestock improvement:** transgenic animals, animal vaccine production, Increased milk production, artificial insemination, poultry and fisheries.		

Textbooks/References

1. Bhasin, M.K. and Nath, S. 2002. Role of Forensic Science in the New Millennium, University of Delhi,
2. Crueger Wand Crueger, A. 2000. Biotechnology: A textbook of Industrial Microbiology. 2nd edition. Panima Publishing Co. New Delhi.
3. Eckert, W.G. and Wrightin, R.K. 1997. Introduction to Forensic Sciences, 2nd Edition, CRC Press, Boca Raton.
4. Hans-Joachim Jordening and Jesef Winter, 2005. Environmental Biotechnology Concepts and Applications.
5. James, S.H. and Nordby, J.J. 2005. Forensic Science: An Introduction to Scientific and Investigative Techniques, 2nd Edition, CRC Press, Boca Raton.
6. Nanda, B.B. and Tiwari, R.K. 2001. Forensic Science in India: A Vision for the Twenty First Century, Select Publishers, New Delhi
7. Patel, A.H. 1996. Industrial Microbiology.1st edition, Macmillan India Limited.
8. Pradipta Kumar Mohapatra, 2020. Environmental Biotechnology, Dreamtech Press.
9. Stanbury, P.F., Whitaker, A. and Hall, S.J. 2006. Principles of Fermentation Technology. 2nd edition, Elsevier Science Ltd.

Formative Assessment	
Assessment Occasion	Weightage in Marks
House Examination/Test	15
Written Assignment/Presentation/Project / Term Papers/Seminar	10
Class performance/Participation	05
Total	30

Skill Enhancement Course in Biotechnology

Course 03: Theory: SEC-T1BTC701, Biotechnology Skills &Analytical Techniques

Learning Outcomes:

- Demonstrate skills as per National Occupational Standards (NOS) of "Lab Technician/Assistant" Qualification Pack issued by Life Sciences Sector Skill Development Council-LFS/Q0509, Level3.
- Skills enhancement as per National Occupational Standards (NOS) of "Lab Technician/Assistant" Qualification Pack issued by Life Sciences Sector Skill Development Council-LFS/Q0509, Level 3.
- Knowledge about major activities of biotech industry, regulations and compliance, environment, health and safety (EHS), good laboratory practices (GLP), standard operating procedures (SOP) and GMP as per the industry standards.
- Demonstrate soft skills, such as decision making, planning, organizing, problem solving, analytical thinking, critical thinking and documentation.

Course content:03 theory **Course Title: SEC-T1BTC701: Biotechnology Skills &Analytical Techniques**		
Total Contact Hours: 14 Hours	Duration of ESA:**01**Hrs.	
Formative Assessment Marks:	Summative Assessment Marks: 25	
Insights into biotechnology industry: Biotechnology Industry in Indian and Global context- organization in context of large/medium/small enterprises, their structure and benefits. **Industry oriented professional skills to be acquired:** Planning and organizing skills, decision-making, problem-solving skills, analytical thinking, critical thinking, team management, risk assessment. **Interpersonal skills:** Writing skills, reading skills, oral communication, conflict-resolution techniques, interpretation of research data, trouble shooting in workplace **Digitals kills:** Basic computer skills (MS Office, excel, power point, internet) for workplace. Professional E-mail drafting skills and power point presentation skills **Analytical skills in laboratory: Solutions:** molarity, molality, normality, mass percent % (w/w), percent by volume (%v/v), parts per million (ppm), parts per billion (ppb), dilution of concentrated solutions. Standard solutions, stock solution, solution of acids. Reagent bottle label reading and precautions		14 h

Practical content of Biotechnology Skills &Analytical Techniques

Course content:03 Course Title: **SEC-P1BTC701**: **Biotechnological Skills & Analytical Techniques**	
Total Contact Hours: 28 Hours	Duration of ESA:02Hrs.
Formative Assessment Marks: 25	Summative Assessment Marks: 25

1. **Methods and practices of cleaning and management of lab:** Learning and Practice of Integrated clean-in-place (CIP) and sterilize-in-place (SIP) as per industry standards, material requirements for cleaning specific area, equipment, ventilation area, personal protective requirements
2. **Procedure of cleaning and storage of lab ware:** Methodology for storage area, cleaning procedure and materials to be used for various surfaces. Signboards, labelling do's & don'ts Knowledge about standard procedures of cleaning or glass ware, plastic ware. Maintenance of inventor
3. **Principles and practices of lab safety:** Knowledge about safety symbols and hazard signs. Personal safety gears, utility, and disposal. Equipment safety protocols, chemical safety protocols. Documentation of chemical and equipment usage records. Handling hazardous chemicals.
4. **Best practices of usage and storage of chemicals:** Knowledge and practice in handling of chemicals, labeling and stock maintenance. SOP and material handling. Procedures to maintain chemicals, labelling, storage and disposal.
5. **Record maintenance as per SOP's:** Labelling of samples and reagents as per SOP's. Recording detail's of work done for research experiments. Importance of study of manuals, health and safety instructions.
6. **Usage and maintenance of basic equipment's of biotechnology lab**: Principles, calibrations and SOPs of weighing balances, pH meters, autoclaves, laminar flows and biosafety cabinets, basic microscopes, homogenizers, stirrers, colorimeters, UV and visible spectrophotometers.
7. **Preparation of solutions and standards -** Properties and uses of chemicals commonly used in life science laboratories. Maintaining safety standards for handling various solutions and chemicals. Preparation of test reagents and buffers. Protocols for proper mixing of chemicals. Safety precautions while preparation and storage of incompatible chemicals and reagents.
8. **Preparation of media**: Maintenance and storage of purified water for media (plant tissue culture media, microbiological media and animal cell culture media) preparation. Preparation and storage of concentrated stock solutions. Documentation and disposal of expired stocks. Collection of indents of media requirement, preparation, and storage. Media coding, documentation and purpose of usage.
9. **Practical methods for decontamination and disposal:** Decontamination methods, safe disposal practices of decontaminated media or materials.
10. **Laboratory record writing:** Method of record writing, data collection and recording, reporting of result, discussion of result, summary writing, effective power point presentation taking any experiment as example.

11. Industry visit or analytical laboratory visit

Pedagogy: Lectures, Presentations, videos, Assignments and Weekly Formative Assessment Tests.

Formative Assessment	
Assessment Occasion	**Weightage in Marks**
Assignment/Monograph	10
Test	10
Participation in class	05
Total	**25**

B.Sc. Biotechnology (Basic / Hons.), Second Semester

Course Title: DSC-T2, BTC102, Microbiological Methods (A2)	
Course Code: **DSC-T2BTC102**	L-T-P per week: 4-0-0
Total Contact Hours: **56**	Course Credits: 0**4**
Formative Assessment Marks: **40**	Duration of ESA/Exam: 0**3 h**
Model Syllabus Authors: **Curriculum Committee**	Summative Assessment Marks: **60**

Course Outcomes (COs): At the end of the course the students will be able to:

Course Articulation Matrix: Mapping of Course Outcomes (Cos) with Program Outcomes (Pos 1-12)

Sl. No	Course Outcomes (COs) / Program Outcomes (POs)	T1	1	2	3	4	5	6	7	8	9	10	11
I	Core competency	X											
II	Critical thinking	X											
III	Analytical reasoning	X											
IV	Research skills	X											
V	Team work	X											

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark ‘X’ in the intersection cell if a course outcome addresses a particular program outcome.

B.Sc. Biotechnology (Basic / Hons.), Second Semester

Content of Course 01: Theory: DSC-T2BTC102: Microbiological Methods	**56 h**
Unit – 1: Instrumentation	**14 h**
UNIT 1. INTRODUCTION TO GENERAL MICROBIOLOGY. **Microscopy:** Principles of Microscopy-resolving power, numerical aperture, working principle and applications of light, compound microscope, Dark field microscope, Phase contrast microscope, Fluorescence microscope, confocal microscope. Electron microscopes - TEM and SEM.	
Unit – 2: Sterilization techniques	**14 h**
Definition of terms - sterilization, disinfectant, antiseptic, sanitizer, germicide, microbicidal agents, microbiostatic agents and antimicrobial agents. **Physical methods of control:** Principle, construction and applications of moist heat sterilization Boiling, Pasteurization, Fractional sterilization - Tyndallization and autoclave. Dry heat sterilization – Incineration and hot air oven. Filtration– Diatomaceous earth filter, Seitz filter, membrane filter and HEPA; Radiation: Ionizing radiation – **γ**-rays and non-ionizing radiation – UV rays **Chemical methods:** Alcohols, aldehydes, phenols, halogen, metallic salts, Quaternary ammonium compounds and sterilizing gases as antimicrobial agents.	
Unit – 3: Microbiological techniques	**14 h**
Culture Media: Components of media, natural and synthetic media, chemically defined media, complex media, selective, differential, indicator, enriched and enrichment media **Pure culture methods:** Serial dilution and plating methods (pour, spread, streak); cultivation, maintenance and preservation/stocking of pure cultures; cultivation of anaerobic bacteria **Stains and staining techniques:** Principles of staining, Types of stains-simple stains, structural stains and differential stains.	
Unit – 4: Antimicrobial agents and assessment of antimicrobial activity	**14 h**
Modes of action of antimicrobial agents: Antifungal agents; Amphotericin B, Griseofulvin Antiviral agents; Amantadine, Acyclovir, Azidothymine Antibacterial agents; Plazomicin, Ervacycline, Omadacyclin and imipenum Challenges in antimicrobial therapy; Emergence of resistance (MDR, XDR) **Assessment of antimicrobial activity:** Antibacterial- Disc and agar well diffusion techniques, Microdilution method, Zones of inhibition, MBC, Determination of IC 50. Antifungal- Determination of MFC, Time kill kinetics assay, sorbitol assay, Antiviral- CPE, virus yield reduction assay, TCID, Neutralization assay, Haemagglutination inhibition.	

Formative Assessment	
Assessment Occasion	**Weightage in marks**
Assignment/ Field Report/ Project	15 Marks
Test	20 Marks
Participation in class	05 marks
Total	**40 Marks**

Microbiological Methods Laboratory Content

Course 01: Practicals: DSC-P2BTC102: Microbiological Methods

Course Title: **Microbiological Methods**	Course Credits: **02**
Course Code: **DSC-P2BTC102**	L-T-P per week: 0-0-4
Total Contact Hours: **28**	Duration of ESA/Exam: 03 h
Formative Assessment Marks: **25**	Summative Assessment Marks: 2**5**

1. To study the principle and applications of important instruments (biological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter) used in the microbiology and biotechnology laboratory.
2. Sterilization of media using autoclave and assessment for sterility.
3. Sterilization of glass wares using hot air oven and assessment for sterility.
4. Sterilization of heat sensitive material by membrane filtration and assessment for sterility.
5. Preparation of culture media for bacteria, fungi and their cultivation.
6. Plating techniques: Spread plate, pour plate and streak plate.
7. Isolation of bacteria and fungi from soil, water and air.
8. Study of *Rhizopus*, *Penicillium*, *Aspergillus* using temporary mounts.
9. Colony characteristics study of bacteria from air exposure plate.
10. Staining techniques: Bacteria – gram, negative, capsule, endospore staining and Fungi – Lactophenol cotton blue staining.
11. Water analysis – MPN test.
12. Biochemical Tests – IMViC, starch hydrolysis, catalase test, gelatin hydrolysis.
13. Bacterial cell motility – hanging drop technique

Pedagogy: Lectures, Presentations, videos, Assignments and Weekly Formative Assessment Tests.

Formative Assessment	
Assessment Occasion	**Weightage in Marks**
Assignment/Monograph	10
Test	10
Participation in class	05
Total	**25**

Text Books/References

1. Atlas, R.M. 1997. Principles of Microbiology. 2nd edition. WM.T. Brown Publishers.
2. Black, J.G. 2008. Microbiology: Principles and Explorations. 7th edition. Prentice Hall Bull, A.T. 1987. Biotechnology, International Trends of perspectives.
3. Cappucino, J. and Sherman, N. 2010. Microbiology: A Laboratory Manual. 9th edition. Pearson Education Limited.
4. Frobisher, Saunders and Toppan 1974. Fundamentals of Microbiology Publications
5. Madigan, M.T, and Martinko, J.M. 2014. Brock Biology of Micro-organisms. 14th

edition. Parker J. Prentice Hall International, Inc.
6. Paul A. Ketchum, 1988. Microbiology, Concepts and applications, Wiley Publications.
7. Pelczar Jr M.J., Chan, E.C.S. and Krieg, N.R. 2004. Microbiology. 5th edition Tata McGraw Hill.
8. Salley, 1984. Fundamentals of Bacteriology, Tata McGraw Hill Education.
9. Singh, R.B. 1990. Introductory Biotechnology, C.B.D. India
10. Srivastava, S and Srivastava, P.S. 2003. Understanding Bacteria. Kluwer Academic Publishers, Dordrecht.
11. Stanier, R.Y., Ingraham, J.L., Wheelis, M.L. and Painter, P.R. 2005. General Microbiology. 5th edition McMillan.
12. Tortora, G.J., Funke, B.R. and Case, C.L. 2008. Microbiology: An Introduction. 9th edition Pearson Education.
13. Willey, J.M., Sherwood, L.M. and Woolverton, C.J. 2013. Prescott's Microbiology. 9th edition. McGraw Hill Higher Education.

Content of Course 02: Theory: OE-T2BTC302: Applications of Biotechnology in Agriculture

Course Title: Applications of Biotechnology in Agriculture	Course Credits: 03	
Course Code: OE-T2MBL302	L-T-P per week: 0-0-3	
Total Contact Hours: 42h	Duration of ESA/Exam: 3h	
Formative Assessment Marks: 30	Summative Assessment Marks: 45	
Unit – 1: Agricultural Biotechnology		**14 h**
Soil and air as a major component of environment. Types, properties and uses of soil and air. Distribution of microorganisms in soil and air. Major types of beneficial microorganisms in soil. Major types of harmful microorganisms in soil.		
Unit – 2: Transgenic plants		**14 h**
The GM crop debate – safety, ethics, perception and acceptance of GM crops, GM crops case study: Bt-cotton, Bt-brinjal Plants as bio-factories for molecular pharming: edible vaccines, plantibodies, nutraceuticals.		
Unit – 3: Biopesticides		**14 h**
Baculovirus pesticides, Myco pesticides, Post - harvest protection: Antisense RNA technology for extending shelf life of fruits and shelf life of flowers. Genetic Engineering for quality improvement: Seed storage proteins, Flavours - capsaicin, vanillin		

Text Books/References

1. Chrispeels, M.J. et al. 1994. Plants, Genes and Agriculture-Jones and Bartlett Publishers, Boston.
2. Gamborg, O.L. and Philips, G.C. 1998. Plant cell, tissue and organ culture (2nd ed.) Narosa Publishing House. New Delhi.
3. Gistou, Pand Klu, H. 2004. Hand book of Plant Biotechnology (Vol.I & II). John Publication.
4. Hammound, J.P McGravey and Yusibov. V. 2000. Plant Biotechnology, Springer verlag.
5. Heldt. 1997. Plant Biochemistry and Molecular Biology. Oxford and IBH Publishing Co. Pvt. Ltd. Delhi.
6. Lydiane Kyte and John Kleyn. 1996. Plants from test tubes. An introduction to Micropropagation (3rd ed.). Timber Press, Portland.
7. Murray, D.R. 1996. Advanced methods in plant breeding and biotechnology. Panima Publishing Corporation.
8. Nickoloff, J.A. 1995. Methods in molecular biology, Plant cell electroporation and electro fusion protocols – Humana pressin corp, USA.
9. Sawahel, W.A. 1997. Plant genetic transformation technology. Daya Publishing House, Delhi.

Pedagogy: Chalk and Talk, PPT, Group discussion, Seminars, Field visit

Formative Assessment	
Assessment Occasion	Weightage in Marks
House Examination/Test	15
Written Assignment/Presentation/Project / Term Papers/Seminar	10
Class performance/Participation	05
Total	30

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.

SURANA COLLEGE

(Autonomous)

SOUTHEND ROAD,BANGALORE -560004

Syllabus for mathematics

Undergraduate(UG) programme

I and II semester

Framed according to Bangalore university NEP (National Education Policy) syllabus -2021

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road
Bangalore - 560 004

SURANA COLLEGE
(AUTONOMOUS)
#16,Southend road,Bangalore-04
BANGALORE UNIVERSITY
DEPARTMENT OF MATHEMATICS

BOARD OF STUDIES
23rd MARCH 2022

Sl.No	Name of Member	Signature
1.	**Prof. B.Cheluvaraju, University Nominee** Department of Mathematics, Bangalore university	B. Ch 23/03/22
2.	**Dr. Bhagya.S -Subject Expert** NMKRV College (Autonomous), Bangalore-04	S. Bhagya 23/3/22
3.	**Dr.S.B.Satyanarayana -Subject Expert** Vijaya College,R.V Road, Bangalore	Satyanarayana 23/3/22.
4.	**Prof.T.R.Marulasiddappa(Chairperson,BOS)** Surana college, South end road, Bangalore-04	T.R. Marulasiddappa 23/3/22
5.	**Prof.Veena.V(Member)** Surana college, Southend road, Bangalore-04	Veena.V 23/3/22
6.	**Ms.Anusha.R-Industry Representative** System Engineer, Infosys Pvt limited	Anusha.R 23/03/22
7.	**Mr.Kushal.S-Alumni Nominee** Assistant, ISR0, Bangalore.	23/03/22

SURANA COLLEGE

(AUTONOMOUS)
#16,Southend road,Bangalore-04
BANGALORE UNIVERSITY
DEPARTMENT OF MATHEMATICS

PANEL OF EXAMINERS / PAPER SETTERS FOR 1ST TO 6TH SEMESTER B.Sc.

1. Dr. S Bhagya - NMKRV College for Women B-04
2. Dr. Sumithra S R – Govt. Science College, Autonomous.
3. Dr. Radhakrishna .D- HOD Vijaya College, RV Road B-04
4. Dr. S.B Sathyanarayana - Vijaya College, RV Road B-04
5. Dr. Arathi M S – Jain University
6. Prof. H S Mahesh – RPA FGC B-10
7. Prof. T C Ramesh – HOD, Sheshadripuram, Yelahanka
8. Prof. K L S Sharma – HOD, BHS College, B-11
9. Dr. Shailaja.M – GFGC, Vijayanagar
10. Dr. Maheshwari P G - GFGC, Vijayanagar
11. Dr. Yamini J- GFGC, Vijayanagar
12. Prof. Sundramma .P– HOD, National College, Basavanagudi
13. Prof. Sumana S – RPA FGC, B-10
14. Prof. Shoba T – Sheshadripuram FGC Yelahanka,
15. Prof. Sheeba S – NMKRV (Autonomous), B-04
16. Prof. Swathi V Hebbar – Dayanada Sagar College
17. Prof. Shobha V – GFGC, Kengeri
18. Prof. Chandrashekar – KLE College, B-10
19. Dr. Lakshmi Janardhan, GFGC, B-40
20. Dr. Karan Kumar – KLE College, B-10
21. Dr.Madhukar,St Joseph College (Autonomous),Bangalore.

Signature of the Board Members

Prof Marulasiddappa T R
(Chairperson BOS)

Dr. B Cheluvaraju
(University Nominee)

Dr. Bhagya S
(Subject Expert)

Dr S.B. Sathyanarayana
(Subject Expert)

Ms . Anusha R
(Industry Representative)

Mr.Kushal.S
(Alumni)

Prof Veena V
(Member)

Preamble

The subject wise expert committee to draft model curriculum contents in Mathematics constituted by the Department of Higher Education, Government of Karnataka, Bangalore vide GO No. ED 260 UNE 2019 (PART-1) DATED 13.08.2021 is pleased to submit its partial report on the syllabus for the First Year (First & Second Semesters) B.Sc.(Basic/Honors) Mathematics and detailed Course Structure for B.Sc.(Honors) Mathematics and M.Sc. (One Year) Mathematics.

The committee discussed various models suggested by the Karnataka State Higher Education Council in its joint meetings with the Chairpersons of Board of Studies of all state universities in Karnataka and resolved to adopt Model IIA (Model Program Structure for the Bachelor of Science (Basic/Hons.) for the subjects with practical's with Mathematics as Major/Minor.

To achieve the core objectives of the National Education Policy 2020 it is unanimously resolved to introduce computer based practical's for the Discipline Core (DSC) courses by using Free and Open Source Software's (FOSS) tools for implementation of theory based on DSC courses as it is also suggested by the LOCF committee that the papers may be taught using various Computer Algebra

System (CAS) software's such as Mathematica, MATLAB, Maxima and R to strengthen the conceptual understanding and widen up the horizon of students' self-experience. In view of these observations the subject expert committee suggested the software's Python/ Maxima/ Scilab/ Maple/ MatLab/ Mathematica for hands on experience of implementation of mathematical concepts in computer based lab.

The expert committee suggests the implementation this curriculum structure in all the Departments of Mathematics in Universities/Colleges in Karnataka.

The subject expert committee designed the Course Learning Outcome (CO) to help the learners to understand the main objectives of studying the courses by keeping in mind of the Programme outcomes (PO) of the graduate degree with honors in Mathematics or a graduate degree with Mathematics as a major subject.

As the Mathematics subject is a vast with several branches of specializations, it is difficult for every student to learn each branch of Mathematics, even though each paper has its own importance. Hence the subject expert committee suggests number of elective papers (for both Discipline electives and Open

Electives) along with Discipline Core Courses. The BoS in Mathematics of universities may include additional electives based on the expertise of their staff and needs of the students'.

A student can select elective paper as per her/his needs and interest. The subject expert committee in Mathematics suggests that the concerned Department/Autonomous Colleges/Universities to encourage their faculty members to include necessary topics in addition to courses suggested by the expert committee.

B.Sc. Mathematics (Honors)

Programme Outcomes (PO): By the end of the program the students will be able to:

PO 1	**Disciplinary Knowledge:** Bachelor degree in Mathematics is the culmination of in-depth knowledge of Algebra, Calculus, Geometry, differential equations and several other branches of pure and applied mathematics. This also leads to study the related areas such as computer science and other allied subjects.
PO 2	**Communication Skills**: Ability to communicate various mathematical concepts effectively using examples and their geometrical visualization. The skills and knowledge gained in this program will lead to the proficiency in analytical reasoning which can be used for modeling and solving of real life problems.
PO 3	**Critical thinking and analytical reasoning:** The students undergoing this programme acquire ability of critical thinking and logical reasoning and capability of recognizing and distinguishing the various aspects of real life problems.
PO 4	**Problem Solving** : The Mathematical knowledge gained by the students through this programme develop an ability to analyze the problems, identify and define appropriate computing requirements for its solutions. This programme enhances students overall development and also equip them with mathematical modeling ability, problem solving skills.
PO 5	**Research related skills:** The completing this programme develop the capability of inquiring about appropriate questions relating to the Mathematical concepts in different areas of Mathematics.

PO 6	**Information/digital Literacy**: The completion of this programme will enable the learner to use appropriate softwares to solve system of algebraic equation and differential equations.
PO 7	**Self –directed learning**: The student completing this program will develop an ability of working independently and to make an in depth study of various notions of Mathematics.
PO 8	**Moral and ethical awareness/reasoning:** : The student completing this program will develop an ability to identify unethical behavior such as fabrication, falsification or misinterpretation of data and adopting objectives, unbiased and truthful actions in all aspects of life in general and mathematical studies in particular.
PO 9	**Lifelong learning**: This programme provides self-directed learning and lifelong learning skills. This programme helps the learner to think independently and develop algorithms and computational skills for solving real word problems.
PO 10	Ability to peruse advanced studies and research in pure and applied Mathematical sciences.

Assessment

Weightage for the Assessments (in percentage)

Type of Course	Formative Assessment/ I.A.	Summative Assessment (S.A.)
Theory	40%	60 %
Practical	50%	50 %
Projects	40 %	60 %
Experiential Learning (Internship etc.)	--	--

Contents of Courses for B.Sc. with Mathematics as Major Subject & B.Sc.(Hons) Mathematics

Model IIA

Semester	Course No.	Theory/ Practical	Credits	Paper Title	Marks	
					S.A.	I.A.
I	MATDSCT1.1	Theory	4	Algebra - I and Calculus - I	60	40
	MATDSCP1.1	Practical	2	Theory based Practical's on Algebra - I and Calculus - I	25	25
	MATOET1.1	Theory	3	(A) Mathematics –I (B) Business Mathematics –I	60	40
II	MATDSCT2.1	Theory	4	Algebra - II and Calculus - II	60	40
	MATDSCP2.1	Practical	2	Theory based Practical's on Algebra - II and Calculus - II	25	25
	MATOET2.1	Theory	3	(A) Mathematics –II (B) Business Mathematics-II	60	40
Exit Option with Certificate						
III	MATDSCT3.1	Theory	4	Ordinary Differential Equations and Real Analysis-I	60	40
	MATDSCP3.1	Practical	2	Theory based Practical's on Ordinary Differential Equations and Real Analysis-I	25	25
	MATOET3.1	Theory	3	(A) Ordinary Differential Equations (B) Quantitative Mathematics	60	40
IV	MATDSCT4.1	Theory	4	Partial Differential Equations and Integral Transforms	60	40
	MATDSCP4.1	Practical	2	Theory based Practical's on Partial Differential Equations and Integral Transforms	25	25
	MATOET4.1	Theory	3	(A) Partial Differential Equations (B) Mathematical Finance	60	40
Exit Option with Diploma						
V	MATDSCT5.1	Theory	3	Real Analysis and Complex Analysis	60	40
	MATDSCP5.1	Practical	2	Theory based Practical's on Real Analysis and Complex Analysis	25	25
	MATDSCT5.2	Theory	3	Ring Theory	60	40
	MATDSCP5.2	Practical	2	Theory based Practical's on Ring Theory	25	25
	MATDSET5.1	Theory	3	(A) Vector Calculus (B) Mechanics (C) Mathematical Logic	60	40
VI	MATDSCT6.1	Theory	3	Linear Algebra	60	40
	MATDSCP6.1	Practical	2	Theory based Practical's on Linear Algebra	25	25

	MATDSCT6.2	Theory	3	Numerical Analysis	60	40
	MATDSCP6.2	Practical	2	Theory based Practical's on Numerical Analysis	25	25
	MATDSET6.1	Theory	3	(A) Analytical Geometry in3D (B) Number Theory (C) Special Functions (D) History of Bhârtîya Gaṇita	60	40
Exit Option with Bachelor of Arts, B.A./ Bachelor of Science, B.Sc. Degree						
VII	MATDSCT7.1	Theory	3	Discrete Mathematics	60	40
	MATDSCP7.1	Practical	2	Theory based Practical's on Discrete Mathematics	25	25
	MATDSCT7.2	Theory	3	Advanced Ordinary Differential Equations	60	40
	MATDSCP7.2	Practical	2	Theory based Practical's on Advanced Ordinary Differential Equations	25	25
	MATDSCT7.3	Theory	4	Advanced Analysis	60	40
	MATDSET 7.1	Theory	3	(A) Graph Theory (B) Entire and Meromorphic Functions (C) General Topology (D) Bhâratîya Trikoṇmiti Śâstra	60	40
	MATDSET 7.2	Theory	3	Research Methodology in Mathematics	60	40
VIII	MATDSCT8.1	Theory	4	Advanced Complex Analysis	60	40
	MATDSCT8.2	Theory	4	Advanced Partial Differential Equations	60	40
	MATDSCT8.3	Theory	3	Fuzzy Sets and Fuzzy Systems	60	40
	MATDSET 8.1	Theory	3	(A) Operations Research (B) Lattice theory and Boolean Algebra (C) Mathematical Modeling (D) *Aṅkapâśa* (Combinatorics)	60	40
	MATDSET 8.2	Research Project	6 (3 + 3)	Research Project* OR Any Two of the following electives (A) Finite Element Methods (B) Cryptography (C) Information Theory and Coding (D) Graph Theory and Networking	120 OR 60 60	80 OR 40 40
Award of Bachelor of Science Honours, B.Sc.(Hons) Degree ı i Mathematics						

One Year M.Sc. degree in Mathematics (Two Semesters)

Semester	Course Number	Theory/ Practic al	Credits	Title of the Course	S.A.	I.A.
I	PGMATDSCT1.1	Theory	3	C++ Programming for Mathematics	60	40
	PGMATDSCP1.1	Practical	2	Computer Practical's on C++ Programming for Mathematics	25	25
	PGMATDSCT1.2	Theory	3	Computational Numerical Methods	60	40
	PGMATDSCP1.2	Practical	2	Computer Practical's on CNM	25	25
	PGMATDSCT1.3	Theory	4	Functional Analysis	60	40
	PGMATDSET1.1	Theory	3	(A) Fluid Mechanics –I (B) Computational Fluid Mechanics (C) Contact Geometry (D) Fuzzy Topology (E) Ramanujan Theta Function and Continued Fractions	60	40
	PGMATDSET1.2	Theory	3	(A) Advanced Graph Theory (B) Partition Theory (C) Algebraic Number Theory (D) Riemannian Geometry	60	40
II	PGMATDSCT2.1	Theory	4	Measure Theory	60	40
	PGMATDSCT2.2	Theory	4	Differential Geometry	**60**	**40**
	PGMATDSCT2.3	Theory	3	Mathematical Methods	60	40
	PGMATDSET2.1	Theory	3	(A) Fluid Mechanics –II (B) Magneto hydrodynamics (C) Finsler Geometry and Relativity (D) Mathematical Modeling	60	40
	PGMATDSET2.2	Project	6	Research Project	120	80

• In lieu of the research Project, two additional elective papers/Internship may be offered **Abbreviation for MATDSCT1.1 /MATDSCP1.1**

MAT – Mathematics ; DSC – Discipline Core; T – Theory/ P – Practical; 1 – First Semester; .1 – Course 1

PGMATDSCT1.1 : PG- Post Graduate ; MAT- Mathematics; DSC- Discipline Core; T- Theory 1 –First Semester; .1 – Course 1

CURRICULUM STRUCTURE FOR UNDERGRADUATE DEGREE PROGRAM Name of the Degree Program : B.Sc. (Honors)
Discipline/Subject : Mathematics Starting
Year of Implementation :2021-22

PROGRAM ARTICULATION MATRIX

Semester	Course No.	Programme Outcomes that the Course Addresses	Pre-Requisite Course(s)	Pedagogy*	Assessment**
I	MATDSCT1.1	PO 1, PO 2, PO 3	-	MOOC PROBLEM SOLVING SEMINAR PROJECT BASED LEARNING ASSIGNMENTS GROUP DISCUSSION	CLASS TESTS SEMINAR QUIZ ASSIGNMENT TERM END EXAM VIVA-VOCE
II	MATDSCT2.1	PO 1, PO 2, PO 3, PO 8	MATDSCT1.1		
III	MATDSCT3.1	PO 1, PO 4, PO7, PO 8	-----		
IV	MATDSCT4.1	PO 1, PO 4, PO7, PO 8	MATDSCT3.1		
V	MATDSCT5.1	PO 1, PO 2, PO 3, PO 5	----		
V	MATDSCT5.2	PO 3, PO 4, PO 7, PO10	MATDSCT2.1		
VI	MATDSCT6.1	PO 6, PO 7, PO 10.	MATDSCT5.2		
VI	MATDSCT6.2	PO 3, PO 4, PO 5, PO 8, PO 9, PO 10.	MATDSCT1.1 & MATDSCT2.1		
VII	MATDSCT7.1	PO 3, PO 4, PO5, PO 7, PO 9.	MATDSCT1.1 & MATDSCT2.1		
VII	MATDSCT7.2	PO 2, PO 4, PO 5, PO 10	MATDSCT3.1		
VII	MATDSCT7.3	PO 2, PO 4, PO 5, PO 10	MATDSCT3.1		
VIII	MATDSCT8.1	PO 2, PO 4, PO 5, PO 10	MATDSCT5.1		
VIII	MATDSCT8.2	PO 2, PO 4, PO 5, PO 10	MATDSCT4.1		
VIII	MATDSCT8.3	PO 2, PO 4, PO 5, PO 10	MATDSCT7.3		

** Pedagogy for student engagement is predominantly Lecture. However, other pedagogies enhancing better student engagement to be recommended for each course. This list includes active learning/ course projects / Problem based or Project based Learning / Case Studies / Self Study like Seminar, Term Paper or MOOC.

*** Every Course needs to include assessment for higher order thinking skills (Applying/ / Evaluating / Creating). However, this column may contain alternate assessment methods that help formative assessment (i.e. assessment for Learning).

B.Sc. with Mathematics as a Minor in the 3rd Year

Semester	Course No.	Theory/ Practical	Credits	Paper Title	Marks	
					S.A.	I.A.
V	MATDSCMT5.1	Theory	3	Complex Analysis	60	40
	MATDSCMP5.1	Practical	2	Theory based Practical's on Complex Analysis	25	25
VI	MATDSCMT6.1	Theory	3	Numerical Analysis	60	40
	MATDSCMP6.1	Practical	2	Theory based Practical's on Numerical Analysis	25	25

Abbreviation for MATDSCMT5.1 / MATDSCMP5.1

MAT – Mathematics; **DSC** – Discipline Core; **M** – Minor; **T** – Theory /**P** – Practical;

5 – Fifth Semester; **.1** – Course 1

Credit Distribution for B.Sc.(Honors) with Mathematics as Major in the 3rd Year

(For Model IIA)

Subject	Semester	Major/ Minor in the 3rdYear	Credits					
			Discipline Specific Core (DSC)	**Open Elective (OE)**	**Discipline Specific Elective (DSE)**	**AECC &Languages**	**Skill Enhancement Courses (SEC)**	**Total Credits**
Mathematics	I – IV	Major	4 Courses (4+2)x 4=24	4Courses 3 x 4 =12	---	(4+4=8) Courses 8x(3+1)= 32	2 Courses 2x(1+1)= 4	72
Other Subject		Minor	24	--	--	--	--	24
								96
Mathematics	V & VI	Major	4 Courses4x(3+2) =20	-----	2Courses 2 x 3 =06	---	2Courses 2 x 2 =4	30
Other Subject		Minor	10	--	--	--	--	10
				(96+40)**=136**				
Mathematics VII	& VIII	Major	2 Courses 2x(3+2)=10 3 Courses 3 x 4 = 12 1Course 1 x 3 =3 Total=25	-----	2Courses 2 x 3 =6 Res.Meth1 x 3 = 3 2 Courses 2 x 3 =6 Total=15	----	-----	40
Total No. of Courses			14	04	07	08	04	
								136+40**=176**

Syllabus for B.Sc. with Mathematics as Major Subject &
B.Sc. (Hons) Mathematics

SEMESTER – I

MATDSCT 1.1: Algebra - I and Calculus – I	
Teaching Hours : 4 Hours/Week	**Credits: 4**
Total Teaching Hours: 56 Hours	**Max. Marks: 100** **(S.A.-60 + I.A. – 40)**

Course Learning Outcomes: This course will enable the students to

- Learn to solve system of linear equations.
- Solve the system of homogeneous and non homogeneous linear of m equations in n variables by using concept of rank of matrix, finding eigen values and eigenvectors.
- Sketch curves in Cartesian, polar and pedal equations.
- Students will be familiar with the techniques of integration and differentiation of function with real variables.
- Identify and apply the intermediate value theorems and L'Hospital rule.

Unit-I: Matrix: Recapitulation of Symmetric and Skew Symmetric matrices, Algebra of Matrices; Row and column reduction to Echelon form. Rank of a matrix; Solution of system of linear equations; Criteria for existence of non- trivial solutions of homogeneous system of linear equations. Solution of non-homogeneous system of linear equations. Eigen values and Eigen vectors of square matrices, Cayley-Hamilton theorem (without Proof) find A^{-1}, A^{-2}, A^{-3} $for\ Matrices\ of\ order\ 2\ and\ order 3$ using C-H theorem

14 Hours

Unit-II: Differential Calculus-I : Limits, Continuity, Differentiability and properties **,Successive Differentiation:** n^{th} Derivatives of Standard functions e^{ax+b},$(ax+b)^n$ $\log(ax+b)$, $\sin(ax+b)$, $\cos(ax+b)$, $e^{ax}\sin(bx+c)$, $e^{ax}\cos(bx+c)$, Leibnitz theorem and its applications.

14 Hours

Unit-III: Differential Calculus-II: Intermediate value theorem, Rolle's Theorem, Lagrange's Mean Value theorem, Cauchy's Mean value theorem and examples. Taylor's theorem, Maclaurin's series, Indeterminate forms and evaluation of limits using L'Hospital rule.

14 Hours

Unit -IV: Polar Co-ordinates: Polar coordinates, angle between the radius vector and tangent. Angle of intersection of two curves (polar forms), length of perpendicular from pole to the tangent, pedal equations. Derivative of an arc in Cartesian, parametric and polar forms, curvature of plane curve-radius of curvature formula in Cartesian, parametric and polar and pedal forms- center of curvature, tracing of curves-standard curves.

14 Hours

Reference Books:

1. University Algebra – N.S. Gopala Krishnan, New Age International (P)Limited, 2015.
2. Theory of Matrices – B S Vatsa, New Age International Publishers, 2010.
3. Matrices – A R Vasista, Krishna Prakashana Mandir, 2014.
4. Differential Calculus – Shanti Narayan, S. Chand & Company, NewDelhi, 1998.
5. Applications of Calculus, Debasish Sengupta, Books and Allied (P) Ltd.,2019.
6. Calculus – Lipman Bers, Holt, Rinehart &Winston, 1969.
7. Calculus – S Narayanan & T. K. Manicavachogam Pillay, S. Viswanathan Pvt.Ltd., vol. I &II, 2009.
8. Schaum's Outline of Calculus – Frank Ayres and Elliott Mendelson, 5^{th} ed. USA: Mc.Graw, 2008.

MATDSCP 1.1: Practical's on Algebra – I and Calculus – I	
Practical Hours : 4 Hours/Week	**Credits: 2**
Total Practical Hours: 56 Hours	**Max. Marks: 50** **(S.A.-25 + I.A. – 25)**

Course Learning Outcomes: This course will enable the students to

- Learn Free and Open-Source Software (FOSS) tools for computer programming
- Solve problem on algebra and calculus theory studied in MATDSCT 1.1 by using FOSS software's.
- Acquire knowledge of applications of algebra and calculus through FOSS.

Practical/Lab Work to be performed in Computer Lab (FOSS)

Suggested Software's: Maxima/Python.

1. Introduction to Python/Maxima.
2. Basic commands in Python/Maxima.
3. Simple examples using Python/Maxima.
4. Matrices –Algebra of matrices.
5. Computation of rank of matrix.
6. Solving the system of homogeneous and non-homogeneous linear algebraic equations.
7. Computation of inverse of matrix using Cayley-Hamilton theorems.
8. Finding the angle between the radius vector and tangent and angle between two curves.
9. Finding the radius of curvature of the given curve.
10. Verification of mean value theorems.
11. Find the Taylor's and Maclaurin's expansion of the given function.
12. Indeterminate forms and evaluation of limits using L-Hospital Rule.
13. Finding the n^{th} derivative.
14. Tracing of standard curves.

Open Elective Course

(For students of Science stream who have not chosen Mathematics as one of Core subjects)

MATOET 1.1: Mathematics – I	
Teaching Hours : 3 Hours/Week	**Credits: 3**
Total Teaching Hours: 42 Hours	**Max. Marks: 100 (S.A.-60 + I.A. – 40)**

Course Learning Outcomes: This course will enable the students to

- Learn to solve system of linear equations.
- Solve the system of homogeneous and non-homogeneous m linear equations by using the concept of rank of matrix, finding eigen values and eigenvectors.
- Students will be familiar with the techniques of differentiation of function with real variables.
- Identify and apply the intermediate value theorems and L'Hospital rule.
- Learn to trace some standard curves.

Unit-I: Matrices: Recapitulation of Symmetric and Skew Symmetric matrices, Algebra of Matrices; Row and column reduction, Echelon form. Rank of a matrix; Solution of system of linear equations; Criteria for existence of non- trivial solutions of homogeneous system of linear equations. Solution of non-homogeneous system of linear equations. Eigen values and Eigen vectors of square matrices, Cayley-Hamilton theorem (Without Proof) find A^{-1}, A^{-2}, A^{-3} $for\ Matrices\ of\ order\ 2\ and\ order 3$ using C-H theorem

14 Hours

Unit-II: Differentialal Calculus-I: Limits, Continuity, Differentiability and properties **Successive Differentiation:** n^{th} Derivatives of Standard functions e^{ax+b}, $(ax+b)^n$, $\log(ax+b)$, $\sin(ax+b)$, $\cos(ax+b)$, $e^{ax}\sin(bx+c)$, $e^{ax}\cos(bx+c)$, Leibnitz theorem and its applications.

14 Hours

Unit III ;Differentialal Calculus-II: Intermediate value theorem, Rolle's Theorem, Lagrange's Mean Value theorem, Cauchy's Mean value theorem and examples. Taylor's theorem, Maclaurin's series, Indeterminate forms and evaluation of limits using L'Hospital rule

14 Hours

Reference Books:

1. University Algebra - N.S. Gopala Krishnan, New Age International (P)Limited, 2015
2. Theory of Matrices - B S Vatsa, New Age International Publishers, 2010.
3. Matrices - A R Vasista, Krishna Prakashana Mandir, 2014.
4. Differential Calculus - Shanti Narayan, S. Chand & Company, NewDelhi, 1998.
5. Applications of Calculus, Debasish Sengupta, Books and Allied (P) Ltd.,2019.
6. Calculus – Lipman Bers, Holt, Rinehart &Winston, 1969.
7. Calculus - S Narayanan & T. K. Manicavachogam Pillay, S. Viswanathan Pvt. Ltd., vol. I &II, 2009.
8. Schaum's Outline of Calculus - Frank Ayres and Elliott Mendelson, 5th ed. USA: Mc.Graw, 2008.

Open Elective
(For Students of other than Science Stream)

MATOE 1.1(B): Business Mathematics-I	
Teaching Hours : 3 Hours/Week	**Credits: 3**
Totat Teaching Hours: 42 Hours	**Max. Marks: 100** **(S.A.- 60 + I.A. – 40)**

Course Learning Outcomes: This course will enable the students to:

- Translate the real word problems through appropriate mathematical modeling.
- Explain the concepts and use equations, formulae and mathematical expression and relationship in a variety of context.
- Finding the extreme values of functions.
- Analyze and demonstrate the mathematical skill require in mathematically intensive areas in economics and business.

Unit-I: Algebra – Set theory and simple applications of Venn Diagram, relations, functions, indices, logarithms, permutations and combinations. Examples on commercial mathematics.

14 Hours

Unit - II: Matrices – Definition of a matrix; types of matrices; algebra of matrices. Properties of determinants; calculations of values of determinants upto third order; Adjoint of a matrix, elementary row and column operations; solution of a system of linear equations having unique solution and involving not more than three variables. Examples on commercial mathematics.

14 Hours

Unit - III: Percentage, Ratios and Proportions – Percentages: Definition, Calculation of percentage, Ratios- Types of Ratios, Duplicate, Triplicate and Sub-Duplicate of ratio, Proportions - Definitions and properties- cross product property and Reciprocal property, United proportions – Continued proportions – Compound proportions, Examples on commercial mathematics.

14 Hours

Reference Books:

1. Basic Mathematics, Allen R.G.D, Macmillan, NewDelhi, 1962.
2. Mathematics for Economics, Dowling,E.T., Schaum's Series,McGrawHill,London, 2020.
3. Quantitative Techniques in Management, Vohra, N.D., Tata McGraw Hill, NewDelhi, 2006.
4. Business Mathematics, Soni R.S., Pitamber Publishing House,Delhi, 1996.

SEMESTER – II

MATDSCT 2.1: Algebra - II and Calculus – II	
Teaching Hours : 4 Hours/Week	**Credits: 4**
Total Teaching Hours: 56 Hours	**Max. Marks: 100 (S.A.-60 + I.A. – 40)**

Course Learning Outcomes: This course will enable the students to

- Recognize the mathematical objects called Groups.
- Link the fundamental concepts of groups and symmetries of geometrical objects.
- Explain the significance of the notions of Cosets, normal subgroups and factor groups.
- Understand the concept of differentiation and fundamental theorems in differentiation and various rules.
- Find the extreme values of functions of two variables.

Unit-I: Groups-I: Definition of a group with examples and properties, abelian group, Subgroups, center of groups, order of an element of a group and its related theorems, cyclic groups, Coset decomposition, Lagrange's theorem and its consequences. Fermat's theorem and Euler's ϕ function.
. **14 hours**

Unit-II: Partial Derivatives: Functions of two or more variables-explicit and implicit functions, partial derivatives. Homogeneous functions- Euler's theorem, total derivatives, differentiation of implicit and composite functions, Jacobians and standard properties and illustrative examples. Taylor's and Maclaurin's series for functions of two variables.

14 hours

Unit-III; integral Calculus I; Reduction formula for $\int sin^n x dx$, $\int cos^n x dx$, $\int sin^n x cos^m x dx$

definite limit, Problems.

Unit-IV: Integral Calculus II: Recapitulation of definite integrals and its properties. Line integral: Definition of line integral and basic properties, examples on evaluation of line integrals. Double integral: Definition of Double integrals, evaluation of double integral with constant limits, Applications. Triple integral: Definition of triple integrals and evaluation of triple integral with constant limit.

28 hours

Reference Books:

1. Topics in Algebra, I N Herstein, Wiley Eastern Ltd., NewDelhi, 2006.
2. Higher algebra, Bernard & Child, Arihant, 2016.
3. Modern Algebra, Sharma and Vasista, Krishna Prakashan Mandir, Meerut, U.P,1960.
4. Differential Calculus, Shanti Narayan, S. Chand & Company, NewDelhi, 1998.
5. Integral Calculus, Shanti Narayan and P K Mittal, S. Chand and Co. Pvt.Ltd., 2015.
6. Schaum's Outline Series, Frank Ayres and Elliott Mendelson, 5th ed. USA: Mc. Graw Hill.,2008.
7. Mathematical Analysis, S C Malik, WileyEastern, 1992.
8. A Course in Abstract Algebra, Vijay K Khanna and S K Bhambri, Vikas Publications, 2018.
9. Textbook of B.Sc. Mathematics, G K Ranganath, S Chand &Company, 2011.

PRACTICAL

MATDSCP 2.1: On Algebra -II and Calculus – II	
Practical Hours: 4 Hours/Week	**Credits: 2**
Total Practical Hours: 56 Hours	**Max. Marks: 50** **(S.A.-25 + I.A. –25)**

Course Learning Outcomes: This course will enable the students to

- Learn Free and Open Source Software (FOSS) tools for computer programming.
- Solve problem on algebra and calculus by using FOSS software's.
- Acquire knowledge of applications of algebra and calculus through FOSS.

Practical/Lab Work to be performed in Computer Lab

Suggested Software's: Maxima/Python.

1. Program to construct Cayley's table and test abelian for given finite set.
2. Program to find all possible cosets of the given finite group.
3. Program to find generators and corresponding possible subgroups of a cyclic group.
4. Programs to verification of Lagrange's theorem with suitable examples.
5. Program to verify the Euler's ϕ function for a given finite group.
6. Program to verify the given function is Homomorphism and Isomorphism.
7. Program to verify the Euler's theorem and its extension.
8. Program to find Jacobian.
9. Programs to construct series using Maclaurin's expansion for functions of two variables.
10. Program to evaluate the line integrals with constant and variable limits.
11. Program to evaluate the Double integrals with constant and variable limits.
12. Program to evaluate the Triple integrals with constant and variable limits.

Open Elective

(For students of Science stream who have not chosen Mathematics as one of the Core subjects)

MATOET 2.1(A): Mathematics – II	
Teaching Hours : 3 Hours/Week	**Credits: 3**
Total Teaching Hours: 42 Hours	**Max. Marks: 100** **(S.A.- 60 + I.A. – 40)**

Course Learning Outcomes: This course will enable the students to

- Recognize the mathematical objects called Groups.
- Link the fundamental concepts of groups and symmetries of geometrical objects.
- Explain the significance of the notions of Cosets, normal subgroups and factor groups.
- Understand the concept of differentiation and fundamental theorems in differentiation and various rules.
- Find the extreme values of functions of two variables.
- To understand the concepts of multiple integrals and their applications.

Unit-I: Groups: Definition of a group with examples and properties, congruence, problems. Subgroups, center of groups, order of an element of a group and its related theorems, cyclic groups, Coset decomposition, Factor groups, Lagrange's theorem and its consequences. Fermat's theorem and Euler's ϕ function.

14 hours

Unit-II: Partial Derivatives: Functions of two or more variables-explicit and implicit functions, partial derivatives. Homogeneous functions- Euler's theorem, total derivatives, differentiation of implicit and composite functions, Jacobians and standard properties and illustrative examples. Taylor's and Maclaurin's series for functions of two variables.

14 hours

Unit-III: Integral Calculus: Recapitulation of definite integrals and its properties. Line integral: Definition of line integral and basic properties, examples on evaluation of line integrals. Double integral: Definition of Double integrals, Triple integral: triple integral definition and evaluation of triple integral with constant limits.

14 hours Reference Books:

1. Topics in Algebra, I N Herstein, 2nd Edition, Wiley Eastern Ltd., New Delhi, 2006.
2. Higher algebra, Bernard & Child, Arihant Pub, 2016.
3. Modern Algebra, Sharma and Vasishta, Krishna Prakashan Mandir, Meerut, U.P, 1960.
4. A Course in Abstract Algebra, Vijay K Khanna and S K Bhambri, Vikas Publications, 2018.
5. Differential Calculus, Shanti Narayan, S. Chand & Company, NewDelhi, 1998.
6. Integral Calculus, Shanti Narayan and P K Mittal, S. Chand and Co. Pvt.Ltd., 2015.
7. Schaum's Outline Series, Frank Ayres and Elliott Mendelson, 5th ed. USA:McGraw Hill.,2008.
8. Mathematical Analysis, S.C. Malik, Wiley Eastern, 1992.
9. Text Book of B.Sc. Mathematics, G.K. Ranganath, S.Chand & Company, 2011.

Open Elective

(For Students of other than science stream)

MATOET 2.1(B): Business Mathematics-II	
Teaching Hours : 3 Hours/Week	**Credits: 3**
Total Teaching Hours: 42 Hours	**Max. Marks: 100 (S.A.- 60 + I.A. –40)**

Course Learning Outcomes: This course will enable the students to

- Integrate concept in international business concept with functioning of global trade.
- Evaluate the legal, social and economic environment of business.
- Apply decision-support tools to business decision making.
- Will be able to apply knowledge of business concepts and functions in an integrated manner.

Unit - I: Mathematical logic: Propositions, Truth values, Logical connectives, Truth table, Tautology and Contradiction, Logical equivalence, Negations, Converse, Inverse and Contrapositive of condition proposition and examples on commercial mathematics.

14 hours

Unit - II: Commercial Arithmetic: Interest: Concept of Present value and Future value, Simple interest, Compound interest, Nominal and Effective rate of interest, Examples and Problems Annuity: Ordinary Annuity, Sinking Fund, Annuity due, Present Value and Future Value of Annuity, Equated Monthly Installments (EMI) by Interest of Reducing Balance and Flat Interest methods, Examples and Problems.

14 Hours

Unit - III: Measures of central Tendency and Dispersion: Frequency distribution: Raw data, attributes and variables, Classification of data, frequency distribution, cumulative frequency distribution, Histogram and give curves. Requisites of ideal measures of central tendency, Arithmetic Mean, Median and Mode for ungrouped and grouped data. fundamentals of AM,GM,HM and its related Properties and applications. Concept of dispersion, Measures of dispersion: Range, Variance, Standard deviation (SD) for grouped and ungrouped data, combined SD.

14 Hours

Reference Books:

1. Practical Business Mathematics, S. A. Bari New Literature Publishing Company New Delhi, 1971.
2. Mathematics for Commerce, K. Selvakumar Notion Press Chennai, 2014.
3. Business Mathematics with Applications, Dinesh Khattar& S. R. Arora S. Chand Publishing New Delhi, 2001.
4. Business Mathematics and Statistics, N.G. Das &Dr. J.K. Das McGraw Hill New Delhi, 2017.
5. Fundamentals of Business Mathematics, M. K. Bhowal, Asian Books Pvt. Ltd New Delhi, 2007.
6. Mathematics for Economics and Finance: Methods and Modeling, Martin Anthony and Norman, Biggs Cambridge University Press Cambridge, 2009.
7. Financial Mathematics and its Applications, Ahmed Nazri Wahidudin Ventus Publishing APS Denmark, 2011.
8. Fundamentals of Mathematical Statistics, Gupta S.C. and Kapoor V.K, Sultan Chand and Sons, New Delhi, 2002.
9. Statistical Methods , Gupta S.P.: Sultan Chand and Sons, New Delhi, 2021.
10. Applied Statistics, Mukhopadhya Parimal New Central Book Agency Pvt. Ltd. Calcutta, 2018.
11. Fundamentals of Statistics, Goon A.M., Gupta M.K. and Dasgupta, B. World Press Calcutta, 2008.
12. Fundamentals of Applied Statistics, , Gupta S.C. and Kapoor V.K, Sultan Chand and Sons, New Delhi, 2014.

Principal
Surana College
(AUTONOMOUS)
No. 16, South End Road,
Bangalore - 560 004.