

SYLLABUS

(CCH & DSE, AECC, SECC, GE and AECC-E&V)

(Compiled with reference to
CBCS Regulations wef 2019-20, Odisha State Model Syllabus
& NOU/MSCBU Baripada guidelines from time to time)

(For UG Arts, Science & Commerce)



GOVT WOMEN'S COLLEGE, KEONJHAR

(Affiliated To Maharaja Sriram Chandra Bhanja Deo University, Baripada Erstwhile North Orissa
University, Baripada)

(To be affiliated with Dharani Dhar University, Keonjhar w.e.f. 2023-24)

Compiled by Examination Section, GWC Keonjhar
Coordination with Internal Quality Assurance Cell (IQAC), GWC Keonjhar
(For CCH & DSE , AECC, SECC, GE and AECC-E&V)

Last updated on 09.08.2023

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EV: Unit-5: 5th Semester

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6. Criteria to pass a paper and Examination Question Pattern



OFFICE OF THE CONTROLLER OF EXAMINATIONS
MAHARAJA SRIRAM CHANDRA BHANJA DEO UNIVERSITY
SRIRAM CHANDRA VIHAR, TAKATPUR, BARIPADA, MAYURBHANJ, ODISHA, 757003

NO. MSCBDU/EC/UG/ 3242

Date: 17/12/2021

To

The Principals of All Affiliated Degree Colleges
Under MSCB University, Takatpur, Baripada.

Sub: Subject & Mark distribution for all semester UG examinations for the students of admission batch-2019-20 as per the recommendation given in State model regulation.


Sir/Madam,

I am directed to inform you that the semester wise and paper wise subject name and mark distribution prepared as per the recommendation given in the Model regulations for CBCS pattern is supplied herewith for your information. You are requested to circulate the same to your teaching staff and students for reference. You are requested to intimate the undersigned within seven days if you find any discrepancy in the above information through a return mail.

Though SEC-III in 5th Semester and SEC-IV in 6th Semester are there in the course structure for Science and Arts (Pass) students for the students of admission batch 2019-20 the detailed syllabus does not contain any information about the said papers in any subjects. In this context I am directed to inform you that the corresponding syllabus and subjects are decided to be implemented from the syllabi of the courses implemented as per 2016-17 model regulation.

The Honours students of admission batch 2019-20 (Arts/Science/Commerce) are allowed to prepare a Dissertation under a Project for DSE-IV paper in 6th Semester. No theory examination will be conducted for this paper.

Yours faithfully,


Controller of Examinations
MSCB University

Core Courses for Hons (CCH) & Discipline Specific Elective (DSE):

Permission and Affiliation granted to Govt Women's College, Keonjhar for 17 Hons subjects under Arts, Science & Commerce stream. They are Economics, Education, English, History, Home Science, Odia, Political Sc, Sanskrit, Sociology under Arts stream; Botany, Chemistry, Geology, Mathematics, Physics, Zoology, Computer Science under Science stream and Commerce Hons under Commerce stream.

CCH- 1 to 14 : Each Hons subject consists of fourteen (14) CCH paper & four (4) DSE papers in six semesters. The respective CCH syllabus is available in respective OSHEC model syllabus wef 2019-20.

DSE 1, 2 & 3 : The MSCBU, Baripada has made choice locking for DSE subjects for affiliated college under its jurisdiction and the syllabus is available in respective OSHEC model syllabus wef 2019-20

MSCBU has circulated subject and mark wise distribution of all CCH, DSE, GE, AECC, and SECC papers for clarification of all faculties and students vide letter no 3242/dt 17.12.2021. (Refer page 92 onwards) , 3512/dt 22.12.2021,(page-93) and letter no 451/dt 09.02.2023 (page-5)

MIDTERM SEMESTER EXAMINATION IN CCH & DSE WILL BE FROM UNIT-II ONLY.

(as per HED letter no 20119/dt 19.06.2020)

**Sub: - Introducing 25% Guided Student Self-Study (Blended Learning)
at UG and PG levels**


2. For Under-Graduate courses (Honours as well as Pass), following revised CBCS syllabus effective from 2019-20(i.e. students taking admission in 2019-20 academic year and thereafter), the entire **second unit (i.e. 25% of total four Units) of each subject and paper** is hereby earmarked for student self-study, except AECC (Ability Enhancement Compulsory Course) and SEC (Skill Enhancement Course) papers. **However, for**

7. To ensure that the self-study is taken seriously by students, mid-term internal assessment in all subjects/papers shall be primarily based on the self-study portion of the syllabus. This should be clearly told to the students in the first doubt clearing class.

DSE 4 (Project): is project for all Hons subjects with 100 marks and 6 credit point except Commerce. and letter no 451/dt 09.02.2023 (page-5)

For Commerce DSE-4 is divided into two parts ie project of 50 marks and a theory paper of research methodology of 50 marks with no midterm.

The guidelines for DSE-4 is given in page no (84 to 91)


OFFICE OF THE CONTROLLER OF EXAMINATIONS
MAHARAJA SRIRAM CHANDRA BHANJA DEO UNIVERSITY
SRIRAM CHANDRA VIHAR, TAKATPUR, BARIPADA, MAYURBHANJ, ODISHA, 757003

No. 451 MSCBU/EC/UG/ Date: 09.02.2023

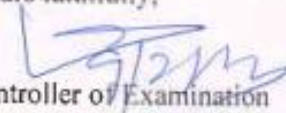
To
The Principals of All Affiliated Degree Colleges
Under MSCB University, Takatpur, Baripada.

Sub: Information regarding DSE-IV for all subjects in 6th Semester UG (R/B) Examination-
2023.

Sir/Madam,

It is to inform all concerned that the DSE-IV paper for Honours students will be project
for all subjects except Commerce.

For Commerce Honours & Pass students it is 50 marks for project and 50 marks for
theory examination.

Yours faithfully,

Controller of Examination
MSCB University



OFFICE OF THE CONTROLLER OF EXAMINATIONS
MAHARAJA SRIRAM CHANDRA BHANJA DEO UNIVERSITY
SRIRAM CHANDRA VIHAR, TAKATPUR, BARIKATA, MAYURBHANJ, ODISHA, 757003

No. 1096 (MSCBU/EC/UG-35/2023)

Date: 15.04.23

OFFICE ORDER

It is for the information of all concerned that the following guidelines for project work/ Dissertation of Discipline Specific Elective (DSE) – 4 for 6th semester UG Examination 2023 and onwards as follows.

- Maximum 8 no. of students are allowed to collaboratively and co-operatively work in a project/dissertation with a single common title if the number of students is more than 8. However Supervisor/Guide are required to allot different topic/title to the students if student representation is less than 8 nos.
- An individual student is required to prepare at least 3 copies of projects reports for fulfilling the requirements given below.
 - A Copy for evaluation by an External examiner appointed by the University and Internal examiner jointly.
 - A copy for the department for future reference.
 - A student Copy.
- The number of pages of the project report/dissertation shall be of minimum 20 pages with one side printing of the pages. The inner text of the report may be designed using Ms-Word as follows.
 - Font - Times New Roman.
 - Font Size – 12
 - Lines Spacing – 1.0
 - The Odia/Hindi/Santali Hons Students have to prepare their project work/dissertation in their respective language preferably using a software or by own hand writing as per previous instruction. Sanskrit Hons Students have to write their project work/dissertation with Odia Scripts using Sanskrit Language.
- The general structure of the report may be –
 - The preliminary section – This includes the Title/Topic page as Front Page, The Declaration, The Certificate, The Acknowledgement, The Abstract/Synopsis, The Contents, The List of Tables and Figures (If any) in the subsequent pages.
 - The Main Body – This includes the Introduction of the Topic, The Definitions involved in the topic, The Description of a Survey or Related Literature, The Details of the Topic, The Findings and Conclusion with suggestions for the scope of Future Work.
 - The Reference Section – This Includes Foot- notes, Bibliography, Appendix/Index (If any).
- An External Examiner Appointed by the University will examine the Project Work/ Dissertation jointly with the Project Supervisor who is treated as an Internal Examiner. The Evaluated Report must be kept with the Principal office for one year for future reference and as required by the University for RTI and any legal matters.
- The principals are required to send soft copies of Mark foils by posting the marks in a folder provided by the undersigned and keep a hard copy of the same with duly signed by External and Internal examiner as per the date line given by University.
- The expenses of the project evaluation will be borne by the Principal/ Centre superintendent of the college out of the project fee charges. The rate of remuneration is Rs.15/- per student for both external and internal subject to a minimum of Rs200/-.The grouping structure is 16 or a part thereof will constitute one group.

Above guidelines must be strictly adhered to for Project Work/ Dissertation of DSC- 4 paper of 6th Semester UG Examinations.

Memo No 1097/MSCBU

Copy Forwarded to the Principals of all Affiliated Colleges Under MSCB University for information. They are requested to communicate the guidelines to the students as well as teachers of their respective colleges.

Controller of Examinations
MSCB University
Date – 15.04.23

Controller of Examinations
MSCB University



OFFICE OF THE CONTROLLER OF EXAMINATIONS
NORTH ORISSA UNIVERSITY
SRIRAM CHANDRA VIHAR, TAKATPUR, BARIPADA, MAYURBHANJ-757003

No. NOU/EC/2019/ 5737⁽⁹⁰⁾

Date: 31.8.2019

To

The Principals,
All the Affiliated Degree Colleges under North Orissa University.

Sub: Clarification regarding GE, MIL and SEC papers in newly introduced CBCS syllabus from the academic session 2019-20.

Sir,

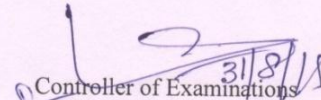
Inviting a reference to the subject cited above, it is to inform you that in addition to the core subject a student has to appear 02 (Two) Generic Elective (GE) subjects, each having 02 (Two) papers out of which 01 (One) paper from each is to be taught in 1st Year and another paper from each will be taught in the 2nd Year.

SEC-1 paper is **Communicative English** and **SEC-2** paper is **Quantitative and Logical Thinking** to be taught in 2nd Year students.

Further, a student may opt **SANTALI as MIL** in addition to the existing options mentioned in the regulation

This is for your information with a request to circulate among all the students and staffs for the benefit of all.

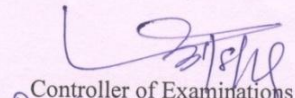
Yours faithfully,


Controller of Examinations
North Orissa University
Date: 31.8.2019

Memo No. 5738⁽⁶⁾ /NOU

Copy forwarded for information and necessary action to:

1. The SPD & Joint Secretary to Government, Higher Education Department, Government of Odisha, Bhubaneswar.
2. The Chairman, P.G. Council, North Orissa University.
3. The Director, College Development Council, North Orissa University.
4. The Director, DDCE, North Orissa University.
5. The Professor- in- charge, University web-site with request to uploading it in the official web-site of the University.
6. OIC to Vice-Chancellor/ P.A to Registrar/ Steno to Controller of Examination, North Orissa University.


Controller of Examinations
North Orissa University

OFFICE OF THE CONTROLLER OF EXAMINATIONS
MAHARAJA SRIRAM CHANDRA BHANJA DEO UNIVERSITY
SRIRAM CHANDRA VIHAR, TAKATPUR, BARIPADA, MAYURBHANJ, ODISHA-757003

No. 2589⁽⁹⁰⁾/MSCBU/2021

Date 07.11.2021

To

All the Principals
+3 Degree Affiliated Colleges under
Maharaja Sriram Chandra Bhanja Deo University

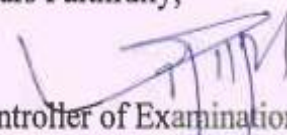
Sub: Implementation of Model Revised Syllabus for “Environmental Studies & Disaster Management” at under graduate level from the academic session 2021-22 under AECC-I.

Sir/Madam,

Inviting a reference to the subject cited above, I am directed to inform you that the syllabus for “Environmental Studies” under AECC-I-Semester-I for UG courses Arts/Science/Commerce (2021-22) now replaced by the revised one entitled as “Environmental Studies & Disaster Management” effective from the academic session-2021-22 as per the details enclosed herewith.

You are requested to implement the course “Environmental Studies & Disaster Management” for +3 1st semester students from the academic session 2021-22.

Yours Faithfully,


Controller of Examinations
MSCB University

ENVIRONMENTAL STUDIES & DISASTER MANAGEMENT
FOR UNDER-GRADUATE COURSES
ARTS, SCIENCE AND COMMERCE (w. e. f. 2021-22)

Course Objectives:

The following objectives have been framed for the proposed curriculum to: -

1. Find out solutions for a sustainable Earth for future generation.
2. Make the stakeholders aware of their rights, responsibilities, and consequences of their conduct toward nature and build resilience.
3. Develop a sense of equitable use of resources and their preservation for the future generation.
4. Sensitize the stakeholders on Disaster and Pandemic preparedness.

Learning Outcome:

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

1. Identify the historical origins of destructive attitudes and practices toward the natural environment.
2. Know the compatibility of human and environmental/ecological values
3. Know the natural resources' available on earth and how to conserve and manage them.
4. Understand the disasters and pandemic they are facing and empower the new generation to face the new challenges.

Pedagogy/Teaching Transaction:

1. Classroom teaching
2. Self- Study
3. E-Learning
4. Guest Lectures
5. Case Study Analysis and Discussion
6. Field Trip/Visit
7. Seminars
8. Audio, Video, Film Based Discussion/Analysis
9. Group Exercises
10. Group Discussions

ENVIRONMENTAL STUDIES & DISASTER MANAGEMENT

FOR UNDER-GRADUATE COURSES

ARTS, SCIENCE AND COMMERCE (w. e. f. 2021-22)

FULL MARKS: 100, (Credit-4)

TIME: 3 HOURS,

END SEMESTER: 80

TIME: 1 HOUR

MID SEMESTER: 20

Model Syllabus:

Unit – I (Environment) (13 periods x 45 min)

The Environment: The Atmosphere, Lithosphere, Hydrosphere, Biosphere, (01 period)

Ecosystem: Energy flow in the ecosystem (01 period)

Biogeochemical Cycle: Water Cycle, Carbon Cycle, Nitrogen Cycle (02 periods)

Pollution: Water Pollution, Air Pollution, Soil Pollution, Radiation Pollution, Industrial Pollution, Light Pollution, Sound Pollution (05 periods)

Environmental Laws: Water Act 1974, Air Act 1981, The Wildlife Protection Act 1972, The Environment Protection Act 1986, The Forest Conservation Act 1980, (04 periods)

Unit-II (Climate Change & Sustainable Development) (13 periodsx45 min)

Population Ecology: Individuals, Species, Population, Community (01 period)

Human Population Growth, Population Control Methods (01 period)

Urbanization and its effect on society (01 period)

Climate Change: Causes, effect, Global Warming, Carbon footprint and environmental protection (05 periods)

Steps taken towards sustainable development: Ban of single-use plastics, Automobile Scrapping Policy, Promotion of Electrical Vehicles (03 periods)

Brief idea on Sustainable Development Goals (SDGs), Agenda 21 of Rio Earth Summit (02 periods)

Unit-III (Disaster Management)

(13 periods x 45 min)

Disaster Management: Types of disasters (Natural and Man-made) and their causes and effect) (02 periods)

Vulnerability Assessment and Risk Analysis: Vulnerability to various disasters (Flood, Cyclone, Earthquake, Heat waves and Lightning) (02 periods)

Institutional Framework: Institutional arrangements for disaster management (National Disaster Management Authority (NDMA), State Disaster Management Authority (SDMA), District Disaster Management Authority (DDMA), National Disaster Response Force- (NDRF) and Odisha Disaster Rapid Action Force (ODRAF) (02 periods)

Preparedness Measures: Disaster Management Cycle, Early Warning System, Pre-Disaster and Post-Disaster Preparedness, Strengthening of SDMA and DDMA, Community Preparedness, Stakeholder participation, Corporate Social Responsibility (CSR) (05 periods)

Survival Skills: Survival skills adopted during and after disaster (Flood,

Unit-IV (Public Health Management)

(13 periods x 45min)

Brief Idea on Epidemics and Pandemics (01 period)

Non-communicable diseases with special reference to Cardiovascular diseases, Cancer, Diabetes, Hypertension and Obesity and their prevention (02 periods)

Communicable diseases with special reference to Covid-19, Flu, Hepatitis, AIDS and Tuberculosis and their transmission (02 periods)

Dynamics of Disease Transmission: Mode of transmission (Direct/Indirect), Events after infection: Immunity (Active vrs Passive, Innate vrs Acquired, Herd Immunity), Incubation Period (02 periods)

Prevention of Epidemics/Pandemics Diseases: Preventing Measures (Quarantine, Sanitization, Personal Protective measures such as Hand washing and use of protective devices, Vaccination); Control Measures (Surveillance, Isolation, Contact Tracing) (03 Periods)

Life Style management (Diet, Physical Exercise, Yoga and sleeping habit) (02 periods)

Role of Different Sectors in Managing Health Disaster: Role of Government (Centre and State), Community, Civil Society, Student mass, NGOs (01 period)

Books Recommended:

1. Asthana DK and Asthana M: A Text Book of Environmental Studies, S. Chand, New Delhi
 2. Bharucha E: A Text Book of Environmental Studies, New Delhi: UGC
 3. Dash MC and Mishra PC: Man and Environment, McMillan, London
 4. Disaster Management and Mitigation Plan, 2013 of Dept. of Health & Family Welfare, Govt. of Odisha*
 5. Mishra DD: *Fundamental Concepts in Environmental Studies*, S. Chand, New Delhi
 6. National Policy on Disaster Management, 2009*
 7. National Disaster Management Plan, 2019*
 8. Odum EP: *Fundamentals of Ecology*, Natraj Publications
 9. State Disaster Management Plan, 2019 of Government of Odisha*
 10. Standard Operating Procedure (SOP) issued by Govt. of India and Govt. Of Odisha on Public Health Managements in the websites: www.mohfw.gov.in and health.odisha.gov.in*
 11. The Disaster Management Act, 2005 of Government of India*
- [Note: Star (*) marked References, published by the State as well as Central Government are available in the open sources]*

Ability Enhancement Compulsory Course (AECC II): Semester-II MIL
(odia, Alternative English, Sanskrit) **

**** The Detailed course is available in the respective language courses.**

For Example, MIL(Odia) is available in the Model Syllabus for Odia

AECC-II : Semester-II
(COMMUNICATIVE ODIA)

ଦକ୍ଷତାବର୍ଦ୍ଧକ ବାଧ୍ୟତାମୂଳକ ପାଠ୍ୟକ୍ରମ
Ability Enhancement Compulsory Course (AECC)
ଯୋଗାଯୋଗମୂଳକ ମାତୃଭାଷା – ଓଡ଼ିଆ
(2019-20)

MIL (Communications) – Odia

ଦ୍ୱିତୀୟ ପର୍ଯ୍ୟାୟ (2nd Semester) ଜଳା, ବିଜ୍ଞାନ ଓ ବାଣିଜ୍ୟ ସାଧାରଣ (Pass) / ସମ୍ମାନ (Hons)
ଶ୍ରେଣୀ ପାଇଁ ଉଦ୍ଦିଷ୍ଟ

ମୋଟ୍ କ୍ରେଡିଟ୍-୪, ମୋଟ୍ ଶ୍ରେଣୀ ପାଠଦାନ ନିର୍ଦ୍ଦିଷ୍ଟ - ୪୦, ଗୋଟିଏ ଶ୍ରେଣୀ ପାଠଦାନର (ପିରିୟଡ୍) ସମୟ ଅବଧି
- ୪୫ ମିନିଟ୍, ପାଠ୍ୟକ୍ରମ - ୨, ପୂର୍ଣ୍ଣସଂଖ୍ୟା - ୧୦୦

(Credits – 4) Total Classes - 40, One Period - 45 Minutes, Course - II, Full Marks - 100

ପାଠ୍ୟକ୍ରମର ଭୂମିକା :

ଏହି ପାଠ୍ୟସମ୍ପର୍କଟି ପସନ୍ଦ ଓ ଆସ୍ଥାଭିତ୍ତିକ (CBCS / ସିବିସିଏସ୍) ପାଠ୍ୟ ପ୍ରଣାଳୀ ଅନୁସାରେ ପ୍ରସ୍ତୁତ ହୋଇଛି । ବିଭିନ୍ନ ସ୍ତରରେ ଆବଶ୍ୟକ ଅନୁସାରେ ସମସାମୟିକ ପରିସ୍ଥିତିକୁ ନେଇ ଭାରବିନିମୟ ଓ ପାରସ୍ପରିକ ଯୋଗାଯୋଗ ସ୍ଥାପନ କରିବା ଓଡ଼ିଆ ଭାଷାରେ ସହଜରେ, ସରଳରେ ହୋଇପାରିବ – ଏ ଦିଗ ପ୍ରତି ଏଥିରେ ଧ୍ୟାନ ଦିଆଯାଇଛି । ଓଡ଼ିଆ ଭାଷା ଓ ସାହିତ୍ୟର ପ୍ରାୟୋଗିକ ଜ୍ଞାନର ବିକାଶ ନିମିତ୍ତ +୩ ସରାୟ ବିଦ୍ୟାର୍ଥୀଙ୍କୁ ଏହି ପାଠ୍ୟକ୍ରମର ଖସଡ଼ାଟି ସାହାଯ୍ୟ କରିବ । ସେଥିପାଇଁ ପ୍ରଚଳିତ ଭାଷାର ବୈୟାକରଣିକ, ବ୍ୟାବହାରିକ ଓ ପ୍ରାୟୋଗିକ ଦିଗ ପ୍ରତି ଏଥିରେ ଧ୍ୟାନ ଦିଆଯାଇଛି । ଏଥିରେ ସଂଯୋଗ ପ୍ରକ୍ରିୟାର ଅନୁବିଧି, ଯୋଗାଯୋଗର ତଥ୍ୟ ଓ ତତ୍ତ୍ୱ ପ୍ରତି ଗୁରୁତ୍ୱ ଦିଆଯାଇଛି । ସରକାରୀ କାର୍ଯ୍ୟାଳୟରେ ଓଡ଼ିଆ ଭାଷାର ବ୍ୟବହାରରେ ଏହା ଦକ୍ଷତା ବୃଦ୍ଧି କରିବ । ଓଡ଼ିଆ ଭାଷାର ପ୍ରୟୋଗରେ ସେମାନେ ଶୁଦ୍ଧ ଓ ପରିଷ୍କୃତ ଭାବରେ ଯେକୌଣସି ପ୍ରକାର ଜ୍ଞାନର ସୂଚନା ତଥ୍ୟ ଓ ସିଦ୍ଧାନ୍ତକୁ ମୌଖିକ ଓ ଲିଖିତ ସ୍ତରରେ ସହଜରେ ପ୍ରକାଶ କରିପାରିବେ ଏବଂ ସେମାନଙ୍କ ମାତୃଭାଷା ପ୍ରୟୋଗର ବିକାଶ ଘଟିପାରିବ ।

ମୂଲ୍ୟ ବିଭାଜନ ପଦ୍ଧତି : (ସବୁଥିରୁ ବିକଳ୍ପ ପଦ୍ଧତି)

- କ) ନିର୍ଦ୍ଧାରିତ ପାଠ୍ୟର ସବୁ ଏକକ (ୟୁନିଟ୍) ରୁ ବିକଳ୍ପସହ ଦୁଇଟି ଲେଖାଏଁ ମୋଟ ୮ଟି ୧୫ନମ୍ବର ବିଶିଷ୍ଟ ଚାର୍ଯ୍ୟପ୍ରଶ୍ନ ପଡ଼ିବ । ବିଦ୍ୟାର୍ଥୀଙ୍କୁ ୪ଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବାକୁ ହେବ । (୧୫ x ୪ = ୬୦)
- ଖ) ନିର୍ଦ୍ଧାରିତ ପାଠ୍ୟର ସବୁ ଏକକରୁ ୧୨ଟି ଅତିସଂକ୍ଷିପ୍ତ ପ୍ରଶ୍ନ ପଡ଼ିବ । ସେଥିରୁ ୧୦ଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବାକୁ ହେବ । (୧୦ x ୨ = ୨୦)
- ଗ) ମହାବିଦ୍ୟାଳୟସରାୟ ଅନ୍ତର୍ଗତ ପରୀକ୍ଷା (୨୦)
- ମୋଟ୍ ମୂଲ୍ୟାଙ୍କ - ୧୦୦

ସବିଶେଷ ପାଠ୍ୟ

ଯୋଗାଯୋଗମୂଳକ ମାତୃଭାଷା – ଓଡ଼ିଆ (AECC)

ପାଠ୍ୟ-୧ / **Course – 1**: ଯୋଗାଯୋଗ ଅନୁବିଧି, ରୀତି ଓ ମାଧ୍ୟମ

୧ମ ଏକକ : ଯୋଗାଯୋଗର ପରିଭାଷା, ଅନୁବିଧି, ପରିସର ଓ ପ୍ରକାରଭେଦ

୨ୟ ଏକକ : ସାକ୍ଷାତକାର, ଭାଷଣ କଳା

୩ୟ ଏକକ : ସମ୍ବାଦର ପରିଭାଷା, ପରିସର ଓ ସମ୍ବାଦ ପ୍ରସ୍ତୁତି

୪ର୍ଥ ଏକକ : ଓଡ଼ିଆ ଭାଷାର ବର୍ଣ୍ଣମାଳା, ବର୍ଣ୍ଣଶୁଦ୍ଧିର ନିରୀକ୍ଷଣ । (ବନାନ ତୁଟି - ସାଦୃଶ୍ୟଜନିତ ଅଶୁଦ୍ଧି, ଲିଙ୍ଗଗତ ଅଶୁଦ୍ଧି, ସନ୍ଧିଗତ ଅଶୁଦ୍ଧି, ସମାସଗତ ଅଶୁଦ୍ଧି, ବଚନ ଓ ବିଭକ୍ତିଗତ ଅଶୁଦ୍ଧି, ବାକ୍ୟ ବିଧିଜନିତ ଅଶୁଦ୍ଧି, ସମାର୍ଥବୋଧକ ଶବ୍ଦାଶୁଦ୍ଧି, ପ୍ରତ୍ୟୟ ଜନିତ ଅଶୁଦ୍ଧି, ଶବ୍ଦ ସଂଯୋଗାତ୍ମକ ଓ ସ୍ବରସଙ୍ଗତି ଜନିତ ଅଶୁଦ୍ଧି)

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ (ପାଠ୍ୟ-୧ / **Course – 1**)

୧. ଯୋଗାଯୋଗ ମୂଳକ ମାତୃଭାଷା (ଓଡ଼ିଆ) ସାମଲ ବିରଞ୍ଚି ନାରାୟଣ, ସତ୍ୟନାରାୟଣ ବୁକ୍ ହୋର, ଜଟକ ।

୨. ସଂଯୋଗ ଅନୁବିଧି, ସନ୍ତୋଷ କୁମାର ହିପାଠୀ, ନାଲନ୍ଦା, ଜଟକ

୩. ଭାଷଣ କଳା ଓ ଅନ୍ୟାନ୍ୟ ପ୍ରସଙ୍ଗ - କୃଷ୍ଣଚନ୍ଦ୍ର ପ୍ରଧାନ, ସତ୍ୟନାରାୟଣ ବୁକ୍ ହୋର, ଜଟକ

୪. ପ୍ରାୟୋଗିକ ଓଡ଼ିଆ ଭାଷା – ଓଡ଼ିଶା ରାଜ୍ୟପାଠ୍ୟ ପୁସ୍ତକ ପ୍ରଣୟନ ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ବର

୫. ସମ୍ବାଦ ଓ ସାମ୍ବାଦିକତା – ଚନ୍ଦ୍ରଶେଖର ମହାପାତ୍ର, ଓଡ଼ିଶା ରାଜ୍ୟ ପାଠ୍ୟପୁସ୍ତକ ପ୍ରଣୟନ ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ବର

୬. ନିର୍ଭୁଲ ଲେଖାର ମୂଳପୁର, ନାଳାନ୍ଦିଭୂଷଣ ହରିଚନ୍ଦନ, ପି.ସି.ଆର ପବ୍ଲିକେସନ, ଭୁବନେଶ୍ବର

୭. ସର୍ବସାର ବ୍ୟାକରଣ - ନାରାୟଣ ମହାପାତ୍ର ଓ ଶ୍ରୀଧର ଦାସ, ନିୟୁ ଷ୍ଟୁଡେଣ୍ଟସ୍ ହୋର, ଜଟକ

AECC-II: SEMESTER-II (COMMUNICATIVE ENGLISH)

Introduction:

The paper is focused upon developing one fundamental skills of Language learning; reading which needs a thorough rethink and revision. In order to build a strong base for acquisition of the communication skills, suitable reading content is selected from diverse areas in prose form. This would boost the learner's competence in expressive and comprehension skills. The well researched language exercises in the form of usage, vocabulary and grammar is the other area that should attract the teacher and learner to work out for giving decent shape to the mastery of English language.

UNIT 1: Short Story

(i) Jim Corbett-The Fight between Leopards

- (ii) Dash Benhur- The Bicycle
- (iii) Dinanath Pathy- George V High School
- (iv) Alexander Baron- The Man who knew too much
- (v) Will f Jenkins- Uneasy Homecoming

UNIT 2: Prose

- (i) Mahatma Gandhi- The way to Equal Distribution
- (ii) S Radhakrishnan- A Call to Youth
- (iii) C V Raman-Water- The Elixir of Life
- (iv) Harold Nicolson- An Educated Person
- (v) Claire Needell Hollander- No Learning without Feeling

UNIT 3:

- (i) Comprehension of a passage and answering the questions

UNIT 4:

- (i) Language exercises-test of vocabulary, usage and grammar

Text Books

All Stories and Prose pieces

Reference Books

- *The Widening Arc: A Selection of Prose and Stories*, Ed. A R Parhi, S Deepika, P Jani, Kitab Bhavan, Bh ubaneswar.
- *A Communicative Grammar of English*, Geoffrey Leech.
- *A University Grammar of English*, Randolph Quirk and Sidney Greenbaum
- *Developing Reading Skills*. F. Grellet. Cambridge: Cambridge University Press

Scheme of examination:

Midterm: 20 marks (to be conducted by the respective college)

Final examination: 80 marks

(A) 5 short questions of 4 marks each to be set from unit 1-2 covering all prescribed stories and prose pieces [10x4=40]

(B) An unknown passage to be set with 5 questions carrying 4 marks each [5x4=20]

(C) 10 bit questions carrying 2 marks each from grammar/vocabulary and usage [10x2=20]

AECC-II: Semester-II

(COMMUNICATIVE SANSKRIT)

Full Marks- End Term: 80 + Mid Term: 20 = 100Marks

1. SANSKRIT PROSE 40 Marks

2. SANSKRIT POETRY 40 Marks

Unit- I & II SANSKRIT PROSE 40 Marks

1. Aparīksitakārakam
2. Pitr̥bhaktih
3. Jimutavahanakatha

Unit- I & II: Two Long Questions – (About 150 words each) 12x2= 24Marks

Four Short Questions - (About 50 words each) 4x4 = 16Marks

Unit- III & IV SANSKRIT POETRY 40 Marks

1. Mahabharata Santi Parva (Ch. 70 on Qualities of Ruler)
2. Mahabharata Santi Parva (Ch. 107 on Democracy)

3. Mahabharata, Santiparva, (Ch. 120 on Duties of Ruler)

Unit- III & IV: Two Long Questions (About 150 words each) 12x2= 24 Marks

Four Short Questions - (About 50 words each) 4x4 = 16 Marks

Core Reading:

1. *Samskrta-pravesa*, Utkal University, Vanivihar, Bhubaneswar
2. *Mahabharata Santi Parva*, Gita Press, Gorakhpur

Suggested Reading:

1. *Mahabharata Santi Parva*, Rastriya Sanskrit Sansthan, New Delhi

SECC-I: Semester-III

Skill Enhancement Compulsory Course (SECC-I)

SECC-1 (Communicative English): 3rd Semester

The students may download the text book of SECC-1 compiled by Odisha State Higher Education Council (OSHEC), Higher education department, Odisha uploaded in the following link.

<http://gwckeonjhar.in/GWCphoto/Syllabus/24.pdf>

SECC-II: Semester-IV

Skill Enhancement Compulsory Course (SECC-II)

SECC-2 (Quantitative & Logical Thinking):4th Semester

The students may download the text book of SECC-2 compiled by Odisha State Higher Education Council (OSHEC), Higher education department, Odisha uploaded in the following link.

<http://gwckeonjhar.in/GWCphoto/Syllabus/25.pdf>

GENERIC ELECTIVE (GE): (Total 2+2=4 papers)

An elective course chosen from an unrelated discipline/subject, with an intention to seek exposure beyond discipline/s of choice is called a Generic Elective. The purpose of this category of papers is to offer the students the option to explore disciplines of interest beyond the choices they make in Core and Discipline Specific Elective papers. **Universities can offer two papers each in two subjects as GE or four papers one subject. The BA pass course also offers 2 GE papers. Depending on the subject, GE1 and GE2 listed in each Honours syllabus may be used as models for the purpose.**

OFFICE OF THE CONTROLLER OF EXAMINATIONS
NORTH ORISSA UNIVERSITY
SRIRAM CHANDRA VIHAR, TAKATPUR, BARIPADA, MAYURBHANJ-757003

No. NOU/EC/2019/ 5737(90)

Date: 31.8.2019

To

The Principals,
All the Affiliated Degree Colleges under North Orissa University.

Sub: Clarification regarding GE, MIL and SEC papers in newly introduced CBCS syllabus from the academic session 2019-20.

Sir,

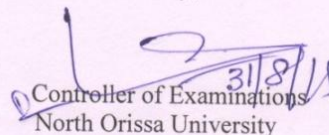
Inviting a reference to the subject cited above, it is to inform you that in addition to the core subject a student has to appear 02 (Two) Generic Elective (GE) subjects, each having 02 (Two) papers out of which 01 (One) paper from each is to be taught in 1st Year and another paper from each will be taught in the 2nd Year.

SEC-1 paper is **Communicative English** and **SEC-2** paper is **Quantitative and Logical Thinking** to be taught in 2nd Year students.

Further, a student may opt **SANTALI as MIL** in addition to the existing options mentioned in the regulation

This is for your information with a request to circulate among all the students and staffs for the benefit of all.

Yours faithfully,


Controller of Examinations
North Orissa University

GE subjects at GWC Keonjhar:

Arts: Economics, Education, History, Home Science, Odia, Political Science, Sanskrit and Sociology.
(A student needs to opt two subjects (A & B) of two papers each such as GE-A-1 (1st Sem); GE-B-1 (2nd Sem); GE-A-2 (3rd Sem) and GE-B-2 (4th Sem))

Science: For Biological science: Chemistry, Botany, and Zoology

For physical Science: Chemistry, Computer Science, Geology, Mathematics, Physics,
(A student needs to opt two subjects (A & B) from their respective physical science or biological science group of two papers each such as GE-A-1 (1st Sem); GE-B-1 (2nd Sem); GE-A-2 (3rd Sem) and GE-B-2 (4th Sem))

Commerce: mentioned in **Commerce** syllabus. (Four papers as GE-1, GE-2, GE-3 GE-4 one paper in each semester up to 4th Sem)

MIDTERM SEMESTER EXAMINATION IN GENERIC ELECTICE WILL BE FROM UNIT-II ONLY.

(as per HED letter no 20119/dt 19.06.2020)

**Sub: - Introducing 25% Guided Student Self-Study (Blended Learning)
at UG and PG levels**

2. For Under-Graduate courses (Honours as well as Pass), following revised CBCS syllabus effective from 2019-20(i.e. students taking admission in 2019-20 academic year and thereafter), the entire **second unit (i.e. 25% of total four Units) of each subject and paper** is hereby earmarked for student self-study, except AECC (Ability Enhancement Compulsory Course) and SEC (Skill Enhancement Course) papers. **However, for**
7. To ensure that the self-study is taken seriously by students, mid-term internal assessment in all subjects/papers shall be primarily based on the self-study portion of the syllabus. This should be clearly told to the students in the first doubt clearing class.

GE: ARTS

GE Subject: ECONOMICS (ECO)

[Incase University offers 2 subjects as GE, then papers 1 and 2 will be the GE paper.]
(copied from page 28 to 30 of Economics model syllabus)

1 st year: (Semester- I & II) : Paper: GE-Eco-A-1 & GE-Eco-B-1

Generic Elective Paper I INDIAN ECONOMY

Introduction: This paper introduces the students to the essentials of Indian economy with an intention of understanding the basic feature of the Indian economy and its planning process. It also aids in developing an insight into the agricultural and industrial development of India. The students will understand the problems and policies relating to the agricultural and industrial sectors of India and current challenges of Indian economy.

Unit I: Introduction to Indian Economy and Current Challenges

Colonialism & British Rule: Exploitation and under-development in India; Basic features of India Economy; Indian Economy as a developing economy; Demographic trends in India - Size and growth of population, Occupational structure, Sex composition, Age structure and demographic dividend; Causes of population growth and population policy; The problem of unemployment and recent policies for employment generation; The problem of inequality in income distribution and its causes, Policies to address inequality.

Unit II: Indian Agriculture

Role of Agriculture in Indian Economy; Cause of low productivity, Green Revolution and Land Reforms, Agricultural Finance-Sources and Problems; Agricultural Marketing in India.

Unit III: Industrial Development in India

Role of Industrialization in Indian Economy; Small Scale & Cottage Industries: Meaning, Role, Problems and Remedies; Industrial Policies of 1948, 1956, 1977 and 1991; Problems of Industrial Development in India; Industrial Sickness.

Unit IV: Service Sector in India

Growth & Contribution to GDP; Composition and relative importance of service sector; Factors determining growth of the sector; ICT and IT – Spread and Policy; Sustainability of services led growth.

Text Book:

- Misra, S. K. and Puri V. K. Indian Economy — Its Development Experience. Himalaya Publishing House, Mumbai

Reference Book:

- Dutt R. and Sundharam K. P. M. *Indian Economy*. S. Chand & Company Ltd., New Delhi.

2nd Year: (Semester- III & IV) : Paper: GE-ECO-A-2 & GE-ECO-B-2

Generic Elective Paper II INDIAN ECONOMY II

Introduction: : This paper is the part II of Indian economy deals with the external sector, financial markets in India, Indian Public Finances and Economic Reforms. This paper also throws some light on current challenges of Indian Economy.

Unit I: External Sector in India

Trends, Composition & Direction in exports from and imports of India; Problems of Balance of Payment: Causes of deficit in BOP & measures to correct it; Trade Policy- Export Promotion Vs Import Substitution; Foreign Trade Policy of India; WTO and India.

Unit II: Financial Markets in India

Commercial Banking in India- Nationalization of Banks; Lead bank scheme and branch expansion; RBI - Functions, Monetary Policy; Development Banking- IFCI, IDBI, SIDBI and NABARD

Unit III: Indian Public Finance

Public Expenditure-Growth and Composition, Causes of Growth of Public Expenditure in India: Tax Revenue of Central and State Governments; Concept of VAT; Deficit Financing in India-Revenue, Budget, Fiscal and Primary Deficits; Purpose and Effects of Deficit Financing; India's Fiscal Policy-Objectives.

Unit IV: Current Challenges Facing Indian Economy

Inflation – Causes, Consequences and Anti-inflationary Policy; Poverty – Poverty line and Estimates, Major Poverty Alleviation Programmes; Environmental Degradation – Growth and Environment; Population Growth and Environment; Environment Policy; Economic Reforms-Globalization, Macroeconomic Stabilization, Structural Reforms, and their impact on the Indian Economy; Foreign capital and MNCs-Role and consequences.

Text Book:

- Misra, S. K. and Puri V. K. Indian Economy — Its Development Experience. Himalaya Publishing House, Mumbai.

Reference Book

- Dutt R. and Sundharam K. P. M. *Indian Economy*. S. Chand & Company Ltd., New Delhi.
- Basu, Kaushik (2016): *An Economist in the Real World: The Art of Policy Making in India*, Penguin.

GE: Subject: EDUCATION (EDN)

[Universities where 2 subjects of two papers each are offered can offer GE1 and GE2.]

(copied from page 48 to 52 of Education model syllabus)

1st Year: (Semester- I & II) : Paper: GE-EDN-A-1 & GE-EDN-B-1

Generic Elective Paper I EDUCATIONAL PHILOSOPHY

Learning Objectives

On completion of this course, the learners shall be able to:

- State and analyse the meaning of education and form own concept on education
- Explain philosophy as the foundation of education
- Analyse aims of education
- Describe the essence of different formal philosophies and draw educational implications
- Compare and contrast Indian and western philosophies of education.

UNIT 1: Education in Philosophical Perspective

- (i) Etymological meaning of education
- (ii) Narrower and broader meaning of education, lifelong education
- (iii) Aims of Education- Individual and Social aims of education
- (iv) Meaning and nature of philosophy
- (v) Branches of Philosophy- Metaphysics, epistemology and axiology, and its educational implications
- (vi) Functions of Philosophy in relation to education

UNIT 2: Formal Schools of Philosophy and their Educational Implications

- (i) Idealism, Naturalism, Pragmatism with reference to: Aims of Education, curriculum, methods of teaching, role of teacher, discipline

UNIT 3: Indian Schools of Philosophy and their Educational Implications

- (i) Common characteristics of Indian philosophy
(ii) Sankhya, Vedanta, , Buddhism, Jainism with reference to: Philosophical tenets, Aims of education, curriculum, methods of teaching, role of teacher.

UNIT 4: Educational Thought of Western and Indian Thinkers

- (i) Plato; (ii) Dewey; (iii) Gopabandhu Das
(iv) Gandhi; (v) Tagore; (vi) Aurobindo

PRACTICAL

- Field visit to a seat of learning in the locality and prepare report.

NB: It will be evaluated by both the internal and External examiners.

Text Books

- Safaya, R.N. & Shaida, B.D. (2010). *Modern Theory and Principles of Education*. New Delhi: Dhanpatrai Publishing Company Pvt. Ltd.
- Ravi, Samuel.S. (2015). *A Comprehensive Study of Education*. Delhi: PHI Learning Pvt. Ltd.
- Nayak, B.K. . . *Text Book of Foundation of Education*. Cuttack, Odisha: Kitab Mahal.

Reference Books

- Aggrawal, J.C. (2013). *Theory and principle of education*. New Delhi: Vikash Publishing House Pvt Ltd.
- Anand, C.L. *et.al.* (1983). *Teacher and education in emerging in Indian society*, New Delhi: NCERT.
- Brubacher, John.S.(1969). *Modern philosophies of education*. New York: McGraw Hill Co.
- Clarke, P. (2001). *Teaching and learning: The Culture of pedagogy*. New Delhi: Sage Publication.
- Dash, B.N. (2011) *Foundation of education*, New Delhi; Kalyani Publishers.
- Dewey, John (1956). *The Child and the curriculum, school and society*. Chicago, Illinois: University of Chicago Press.
- Dewey, John (1997). *Experience and education*. New York: Touchstone.
- Ganesh, Kamala & Thakkar, Usha (Ed.) (2005). *Culture and making of identity in India*. New Delhi: Sage Publications.
- Krishnamurthy, J. (1953). *Education and significance of life*. New Delhi: B.I. Publications
- Kumar Krishna (1996). *Learning from conflict*. New Delhi: Orient Longman.
- Ministry of Education (1966). *Education and national development*. New Delhi: Ministry of Education, Government of India.
- Ornstein, Allan C. & Levine, Daniel U. (1989). *Foundations of education* (4th Edn.). Boston: Houghton Mifflin Co.
- Pathak, R. P. (2012). *Philosophical and sociological principles of education*. Delhi: Pearson.
- Pathak, Avijit (2002). *Social implications of schooling*. New Delhi: Rainbow Publishers.
- Peters, R.S. (1967). *The Concept of education*. London: Routledge Kegan & Paul.
- Radhakrishnan, S. *Indian philosophy* Vol. I and Vol. II
- Ross, James S.(1981). *Ground work of educational theory*.Delhi: Oxford University Press
- Rusk, Robert R., *Philosophical bases of education*, London: Oxford University Press.
- Salamatullah, (1979). *Education in social context*. New Delhi: NCERT.
- Srinivas, M.N., (1986). *Social changes in modern India*. Bombay: Allied Publishers.
- Taneja, V.R. (2000). *Educational thought and practice*, New Delhi: Sterling Publishers Pvt. Limited.
- Wingo, G. Max (1975). *Philosophies of education*. New Delhi: Sterling Publisher Pvt. Limited.

2nd Year: (Semester- III & IV) : Paper: GE-EDN-A-2 & GE-EDN-B-2

Generic Elective Paper II EDUCATIONAL PSYCHOLOGY

Learning Objectives

On completion of this course, the students will:

- Explain the concept of educational psychology and its relationship with psychology.
- Understand different methods of educational psychology.
- Explain the concepts of growth and development of child and adolescence, and underlined general principles of growth and development.
- Describe briefly the periods and the typical characteristics of growth and development during childhood and adolescence.
- Explain the theory of cognitive development and its educational implications.
- State the different forms and characteristics of individual differences and the ways of meeting the classroom issues arising out of the differences.
- Identify the learning needs during the different stages of development and adopt appropriate strategies in and out of school to meet the learning needs.

UNIT 1: Educational Psychology in Developmental Perspective

- (i) Meaning, nature, scope and relevance of educational psychology
- (ii) Methods of educational psychology- observation, experimentation, and case study
- (iii) Application of educational psychology in understanding learner
- (iv) Growth and Development-Concept, difference between growth and development, and principles of growth and development
- (v) Characteristics of development during adolescence in different areas:
- (vi) Physical, social, emotional and intellectual (with reference to Piaget)

UNIT 2: Intelligence, Creativity and Individual difference

- (i) Individual difference-concept, nature, factors and role of education
- (ii) Intelligence- meaning and nature of intelligence, concept of I.Q, theories of intelligence- Two factor theories, Guilford's structure of intelligence (SI) model, Gardner's multiple theory of intelligence.
- (iii) Measurement of intelligence- individual and group test, verbal, non-verbal test
- (iv) Creativity- meaning, nature and stages of creative thinking, strategies for fostering Creativity

UNIT 3: Learning and Motivation

- (i) Learning- meaning, nature and factors of learning

- (ii) Theories of learning with experiment and educational implications-
- (iii) Classical conditioning, operant conditioning, insightful learning and constructivist approach to learning
- (iv) Motivation – concepts, types, and techniques of motivation

UNIT 4: Personality and Mental health

- (i) Personality- meaning and nature of personality
- (ii) Theories- type theory(Jung), trait theory(Allport)
- (iii) Assessment of personality- subjective, objective and projective techniques
- (iv) Mental health-concept, factors affecting mental health and role of teacher, mental health of teacher.
- (v) Adjustment mechanism: concept and types

PRACTICAL

- Case study of an exceptional child and reporting
N.B: It will be evaluated by both the Internal and External examiners.

Text Books

- Chauhan, S.S. (1978). *Advanced educational psychology*. New Delhi: Vikas Publishing House Pvt. Ltd.
- Mangal, S.K. (2002). *Advanced educational psychology*. New Delhi: Prentice Hall of India.
- Woolfolk, A. (2015). *Educational psychology (9th Ed.)*. New Delhi: Pearson Publication

Reference Books

1. Aggarwal, J.C. (2014). *Essentials of Educational Psychology*. New Delhi: Vikas Publishing House Pvt. Ltd.
2. Attri, A.K. (2015). *Psychology of development and learning*. New Delhi: APH Publishing Corporation.
3. Bernard, P.H. (1970). *Mental Health in the class room*. New York: McGraw Hill.
4. Biehler, R.F. & Snowman, J., (1997). *Psychology applied to teaching*. New York: Houghton Mifflin.
5. Bigge, M.L., *Psychological foundations of education*, Harper and Row, New York, 1985.
6. Chandraiah, K. (2011). *Emotional intelligence*. New Delhi: APH Publishing Corporation.
7. Dececco, J.P. & Crawford, W.R. (1997). *Psychology of learning and institution*. New Delhi: Prentice Hall of India.
8. Good T., (1990). *Educational psychology*. Longman, New York, 1990.
9. Lindgren, H.C. (1980). *Educational psychology in the classroom*. New York: Oxford University Press.
10. Mouly, G.J. (1982). *Psychology for teaching*. Allyn & Bacon, Boston.
11. Rothstein, P.R. (1990). *Educational psychology*. New York: McGraw Hill.
12. Salvin, R, (1990). *Educational psychology: theory into practice*, N.J.: Prentice hall,
13. Englewood Cliffs, Snowman and Biehler (---). *Psychology applied to teaching*.....
14. Sprint hall, RC. & Sprint hall, NA, (1990). *Educational psychology, development approach*, New York: McGraw Hill.

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[In case University offers 2 subjects as GE, then paper 1 and 2 will be the GE papers.](page-5)
(copied from page 19 to 21 of History model syllabus)

1st Year: (Semester- I & II) : Paper: GE-Hist-A-1 & GE-Hist-B-1

**Generic Elective Paper I
History of India - I (Early Times to 1750)**

Unit – I : Reconstructing Ancient Indian History

- 1.Sources of Historical Writings.
- 2.Vedic Age : Society, Polity and Culture
- 3.Buddhism and Jainism : Principles and Impact

Unit – II : Polity and Administration

- 1.The Mauryan Empire : Conquest and Administration
- 2.Gupta Society : Land Grants, Peasantry and beginning of Feudal Society
- 3.Gupta Polity : Conquests and Administration
- 4.Harshavardhan : Achievements

Unit – III: Early Medieval Society, Economy and Culture

- 1.Post Gupta Trade and Commerce
- 2.Delhi Sultanate : Conquests and Administration
- 3.Bhakti and Sufi Movements in India
- 4.Development of Regional Language and Literature

Unit – IV: India on the Eve of the Advent of the Mughals

- 1.Sher Shah : Administration and Reforms
- 2.Mughal Administrative Institutions : Zabti, Mansab and Jagir
- 3.Religious Tolerance Sulh-i- Kul
- 4.Mughal Art and Architecture

Suggested Text Books:

- 1.Upinder Singh, History of Ancient & Early Medieval India.
2. Romila Thappar, The Early India

Reference Reading:

1. Irfan Habib, Medieval India, NBT, New Delhi
2. R.S. Sharma, India's Ancient Past
3. S.A.A. Rizvi, Wonder that was India, Vol.II, Rupa
4. Cultural Heritage of India, Bharatiya Vidyabhaban Series, Vol-1-IV
5. A.L. Basheon (ed), Cultural History of India, OUP, New Delhi, 2011

2nd Year: (Semester- III & IV) : Paper: GE-Hist-A-2 & GE-Hist-B-2

**Generic Elective Paper II
History of India - II (1750-1950)**

Unit – I: Foundation and Expansion of British Rule

1. Battle of Plessey (1757) and Conquest of Bengal
2. Conquest of Mysore and Maharashtra
3. Expansion through Diplomacy : Subsidiary Alliance and Doctrine of Lapse

Unit – II Consolidation of British Rule and Indian Responses

1. Peasant & Tribal Resistance against British Rule: Sanyasi Rebellion (1763); Kondh Rebellion in Ghumusar, Santal Rebellion
2. Revolt of 1857 : Nature and Significance
3. Land Revenue Settlements : Permanent Settlement, Ryotwari and Mahalwari Settlement

Unit – III – Social and Cultural Policies

1. Socio-Religious Reform Movements: Brahmo Samaj, Arya Samaj, Theosophical Society, Aligarh Movement.
2. Growth of Press and Education
3. Issues of Caste and Gender : Jyotiba Phule- Women Question and Issues, Depressed Class.

Unit – IV – Indian National Movement

1. Politics of Moderates and Extremists (1885-1920)
2. Gandhian Mass Movements (Non-Cooperation, Civil Disobedience and Quit India Movements), (1920-1940)
3. Communal Politics and Partition
4. Making of the Democratic Constitution

Suggested Text Books:

1. A.R. Desai, Social Background of Indian Nationalism, Popular, Mumbai
2. Priyadarshi Kar, Comprehensive History of Modern India.

Reference Reading:

1. Sumit Sarkar, Modern India : 1885-1947, Mac Millan.
2. B.R. Mani, Debrahminising History: Dominance and Resistance in Indian Society, Manohar, New Delhi, First Published 2005.
3. Chandra Bharil, Social and Political Ideas of B.R. Ambedkar, Aalekh Publishers, Jaipur, 1977.
4. Sumit Sarkar, Modern India (1885-1947), Mac Millan, Delhi, First Published 1983.
5. Hirendra N. Mukherjee, Gandhi, Ambedkar and the Extirpation of Untouchability, PPT, New Delhi.

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GE: Subject: Home Science (HSC)

[Universities where 2 subjects of two papers each are offered can offer GE1 and GE2.]
(copied from page 37 to 40 of Home Science model syllabus)

1st Year: (Semester- I & II) : Paper: GE-HSC-A-1 & GE-HSC-B-1

Generic Elective Paper I HUMAN NUTRITION

Objectives:

To gain knowledge about different nutrients, their classification, function, sources, requirement and deficiency diseases.

UNIT-1 :**Basic Concepts of Nutrition:**

- Meaning and definition of Nutrients & Nutrition.
- Guidelines for good health.
- Food: Definition, Classification.
- Functions of Food- Physiological, psychological and socio-cultural.
- Understanding relationship between food, nutrition and health.
- Basic Food Groups: Basic four, Basic five, Basic seven and their importance.

UNIT-II:**Study of Macro Nutrients**

- Classification, functions, sources, requirement and
- Deficiency diseases of Carbohydrates, proteins & fats.

UNIT-III: Study of Micro-Nutrients:

- Vitamins- Classification, functions, sources, daily requirement & deficiency
- diseases of Fat-soluble & Water -Soluble Vitamins – B Complex Vitamins and Vitamin C.
- Minerals: Functions, sources, daily requirement & deficiency of Iron, calcium, phosphorous, sodium & Iodine.
- Water & roughage- Functions, sources & deficiency.

UNIT IV: Nutrition during different stages of lifecycle:

- Infants,
- Preschool children,
- School going children,
- Adolescent boys and girls,
- Adult man and woman,
- Pregnant Woman and Lactating Mother.

Text Book:

1. Food & Nutrition- Educational Planning Group, Arya Publication, New Delhi.

Reference Books:

- Fundamental of food and Nutrition- by S.R.Mudambi.
- Srilakshmi B (2012) Nutrition Science 4th Revised Edition, New Age International Publishers.
- Khanna K. Gupta, S. Seth R. Passi, SJ, Mahna, R. Puri S (2013) Textbook of Nutrition and Dietetics, Phoenix Publishing House Pvt Ltd.
- ICMR (2010) Recommended Dietary Allowances for India, Published by National Institute of Nutrition, Hyderabad
- Chadha R and Mathur P. eds (2015) Nutrition: A lifecycle Approach, Orient Blackman, New Delhi.
- Seet V and Singh K (2006) Diet Planning through the life Cycle : Part 1 Normal Nutrition A Practical Manual, Elite Publishing House Pvt. Ltd. New Delhi.
- Gopalan C. Rama Sastri BV. Balasubramanian SC (1989) Nutritive Value of Indian Foods, National Institute of Nutrition, ICMR, Hyderabad.
- Wardlaw and Insle, MG, Insel PM (2004), Perspectives in Nutrition, Six Edition, Mr. Graw Hill

2nd Year: (Semester- III & IV) : Paper: GE-HSC-A-2 & GE-HSC-B-2

Generic Elective Paper II Human Development & Family Studies

Objectives:

- To know the importance of child study and about pre-natal Development.
- To understand the importance of Breast feeding and artificial feeding.
- To know the causes and consequences of infant and maternal mortality in India.

UNIT-I:

- Study of Human Development – Meaning and importance of studying human development,
- Stages of Human Development – Infancy, early childhood, late childhood, adolescence, adulthood & old age.

UNIT-II:

- Pre-natal development-
- Conception,
- Symptoms
- Complication of pregnancy.
- Different stages of pre- natal development-period of ovum, embryo & foetus.
- Factors affecting pre-natal Development –Age of the Mother, Nutrition, Drugs and Smoking, X-ray, Infection and chronic diseases of mother, Rh-incompatibility, Maternal emotional state.

UNIT-III:

- Neonatal Care – Immediate baby cleaning ,diet, temperature regulation ,
- Daily Care of the new born baby, care of umbilicus ,care of the tongue and mouth ,massaging and exercise .
- Weaning, and care of the feeding equipment.
- Common childhood ailments -Vomiting, fever, thrush, Diarrhea, constipation Flatulence (wind), nappy rash.
- Maternal and Infant mortality - Causes and prevention

UNIT – IV:

- Family: Meaning, definition, characteristics and functions of family.
- Types of family: Nuclear and joint family, their merits and demerits, causes of disintegration of joint family.

Text Book:

1. Marriage and Family in India-K.M.Kapadia

Reference Books:

2. Child Development –E.B. Hurlock
3. Child Development – by K.C. Panda
4. Family-Goode

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GE: Subject: ODIA

ଅନ୍ତର୍ବିଷୟ ଇଚ୍ଛାଧୀନ ପାଠ - ଓଡ଼ିଆ

Generic Electives (GE) - Course - Odia

[Universities where 2 subjects of two papers each are offered can offer GE1 and GE2.]

ସୂଚନା : ଅନ୍ୟ ସମ୍ମାନର ବିଦ୍ୟାର୍ଥୀ ଏଥିମଧ୍ୟରୁ ୨ଗୋଟି କିମ୍ବା ୪ଗୋଟି ପଢ଼ି ଅଧ୍ୟୟନ କରିପାରିବେ;

(copied from page 22 to 23 of Odia Model CBCS syllabus)

ନମ୍ବର ବିଭାଜନ ବିଧି :

- କ) ପ୍ରତ୍ୟେକ ପତ୍ରର ମୋଟ ନମ୍ବର – ୧୦୦
- ଖ) ଅକ୍ଷରପରୀକ୍ଷା – ୨୦ ଓ ମୁଖ୍ୟ ପରୀକ୍ଷା – ୮୦
- ଗ) ମୁଖ୍ୟ ପରୀକ୍ଷାରେ ପ୍ରତ୍ୟେକ ଏକକରୁ ଦୁଇଟି ଲେଖାଏଁ ୧୫ ନମ୍ବର ବିଶିଷ୍ଟ ପସନ୍ଦମୂଳକ ବୋଧଜ୍ଞାନମାପକ ୮ଟି ଦୀର୍ଘ ପ୍ରଶ୍ନ ପଡ଼ିବ । ୮ ଟି ଦୀର୍ଘ ପ୍ରଶ୍ନରୁ ୪ଟିର ଉତ୍ତର ଦେବାକୁ ହେବ ।
(୧୫ x ୪ = ୬୦)
- ଘ) ସମସ୍ତ ଏକକରୁ ୨ ନମ୍ବର ବିଶିଷ୍ଟ ଲଞ୍ଜ୍ଞାନମୂଳକ ୧୫ଟି ସ୍ଵାଧିଷ୍ଠ ପ୍ରଶ୍ନ ପଡ଼ିବ । ମୋଟ ୧୫ ଗୋଟି ପ୍ରଶ୍ନରୁ ୧୦ ଗୋଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବାକୁ ହେବ ।
(୨ x ୧୦ = ୨୦)

1st Year: (Semester- I & II) : Paper: GE-Odia-A-1 & GE-Odia-B-1

Generic Elective Paper I

ପ୍ରଥମ ପର୍ଯ୍ୟାୟ (Semester – I)

ପାଠ୍ୟ – ୧ / ପତ୍ର – ୧ (Core Course - 1): ଗଣମାଧ୍ୟମ, ବେତାର କଳା ଓ ବିଜ୍ଞାପନ କଳା

୧ମ ଏକକ : ଗଣମାଧ୍ୟମ ଓ ତା'ର ପ୍ରକାରଭେଦ

୨ୟ ଏକକ : ବିଜ୍ଞାପନର ପରିଭାଷା, ପରିସର ଓ ଉଦ୍ଦେଶ୍ୟ

୩ୟ ଏକକ : ସ୍ଥଳ ଲିଖନ ଓ ଫିରର ଲିଖନ

୪ର୍ଥ ଏକକ : ପତ୍ରଲିଖନ (ବାଣିଜ୍ୟିକ, କାର୍ଯ୍ୟାଳୟ ଭିତ୍ତିକ, ବ୍ୟକ୍ତିଗତ ଓ ସମ୍ପାଦକଙ୍କୁ ପତ୍ର)

CBCS SYLLABUS ODIA (+3 Arts, Science & Commerce)

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ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

୧. ଓଡ଼ିଆ ସାହିତ୍ୟକୁ ଆକାଶବାଣୀର ଦାନ – ବ୍ରଜମୋହନ ମହାନ୍ତି, ଓଡ଼ିଶା ବୁକ୍ ଷୋର
୨. ସମ୍ବାଦପତ୍ର ଓ ଗଣମାଧ୍ୟମ – ମୃଣାଳ ତାଙ୍କାର୍ଜୀ, ଶେଫାଳୀ କମ୍ପ୍ୟୁନିକେଶନ, ଦେଈନାଳ
୩. ସମ୍ବାଦ ଓ ସାମ୍ବାଦିକତା – ଚନ୍ଦ୍ରଶେଖର ମହାପାତ୍ର, ଓ.ରା.ପା.ପ୍ର. ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ୱର
୪. ସଂଯୋଗ ଅନୁବିଧି, -ସଙ୍କୋଷ କୁମାର ତ୍ରିପାଠୀ, ନାଳନ୍ଦା, କଟକ
୫. ଯୋଗାଯୋଗମୂଳକ ମାତୃଭାଷା – ଶିଶୁ ନାରାୟଣ ସାମଲ, ସତ୍ୟନାରାୟଣ ବୁକ୍ ଷୋର
୬. ଯୋଗାଯୋଗର ଭାଷା – ସୁଧୀର ଚନ୍ଦ୍ର ମହାନ୍ତି, ପ୍ରାଚୀ ପ୍ରକାଶନ, କଟକ

2nd Year: (Semester- III & IV) : Paper: GE-Odia-A-2 & GE-Odia-B-2

Generic Elective Paper II

ଦ୍ୱିତୀୟ ପର୍ଯ୍ୟାୟ (Semester – II)

ପାଠ୍ୟ – ୨ / ପତ୍ର – ୨ (Core Course -2) : ସାହିତ୍ୟ ଅଧ୍ୟୟନ

୧ମ ଏକକ : ଗଳ୍ପ ସାହିତ୍ୟ

ବୁଢ଼ା ଶଙ୍ଖାରି – ଲକ୍ଷ୍ମୀକାନ୍ତ ମହାପାତ୍ର

ମାଗୁଣାର ଶଗଡ଼ – ଗୋଦାବରୀଶ ମହାପାତ୍ର

ଶିକାର – ଭଗବତୀ ଚରଣ ପାଣିଗ୍ରାହୀ

୨ୟ ଏକକ : ଉପନ୍ୟାସ ସାହିତ୍ୟ

ଶାସ୍ତି – କାହ୍ନୁଚରଣ ମହାନ୍ତି, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

୩ୟ ଏକକ : ନାଟକ

ଶେଷ କଥା – ଡକ୍ଟର ନାରାୟଣ ସାହୁ, ସତ୍ୟନାରାୟଣ ବୁକ୍ ଷୋର, କଟକ

୪ର୍ଥ ଏକକ : ରମ୍ୟ ରଚନା

ବାଇ ମହାନ୍ତି ପାଞ୍ଜି (ପ୍ରଥମ ବିଡ଼ା) – ଗୋପାଳ ଚନ୍ଦ୍ର ପ୍ରହରାଜ

ବରୁଆ – ଗୋବିନ୍ଦ ତ୍ରିପାଠୀ

ସାଧୁ ସଙ୍ଗ – ଚୌଧୁରୀ ହେମକାନ୍ତ ମିଶ୍ର

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

୧. କାହ୍ନୁଚରଣ ବିଶେଷାଙ୍କ, କୋଣାର୍କ, ଓଡ଼ିଶା ସାହିତ୍ୟ ଏକାଡେମୀ
୨. ଓଡ଼ିଆ କ୍ଷୁଦ୍ରଗଳ୍ପର ଇତିହାସ, ବୈଷ୍ଣବ ଚରଣ ସାମଲ, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ
୩. ଓଡ଼ିଆ କଥାସାହିତ୍ୟର କଥା ଓ ରମ୍ୟରଚନା, ମହାପାତ୍ର ନୀଳମଣି ସାହୁ, ଓଡ଼ିଶା ବୁକ୍ ଷୋର, କଟକ
୪. ଶାସ୍ତି - କାହ୍ନୁଚରଣ ମହାନ୍ତି, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ
୫. ଉତ୍ତର ସତୁରୀ ଓଡ଼ିଆ ନାଟକ, ହେମନ୍ତ କୁମାର ଦାସ, ଗ୍ରନ୍ଥମନ୍ଦିର, କଟକ
୬. ଶେଷ କଥା - ନାରାୟଣ ସାହୁ, ସତ୍ୟନାରାୟଣ ବୁକ୍ ଷୋର, କଟକ

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GE: Subject: POLITICAL SCIENCE (PSC)

[Universities where 2 subjects of two papers each are offered can offer GE 1 and GE 2.]
(copied from page 29 to 32 of Political Science model CBCS syllabus)

1st Year: (Semester- I & II) : Paper: GE-PSC-A-1 & GE-PSC-B-1

Generic Elective Paper I FEMINISM: THEORY AND PRACTICE

Introduction: The aim of the course is to introduce students to contemporary debates on feminism and the history of feminist struggles. The course begins with a discussion on construction of gender and an understanding of complexity of patriarchy and goes on to analyze theoretical debates within feminism. It offers a gendered analysis of Indian society, economy and polity with a view to understanding the structures of gender inequalities. And the last section aims to understand the issues with which contemporary Indian women's movements are engaged with.

UNIT-I: Understanding Feminism

- (i) Feminist theorizing of the sex/gender distinction; Public Man and Private Woman
- (ii) Understanding Patriarchy and Feminism

UNIT-II: Theories of Feminism

- (i) Liberal and Socialist,
- (ii) Radical feminism and Eco-feminism

UNIT-III: Feminist issues and women's participation: The Indian Experience

- (i) Women's participation in anti-colonial and national liberation movements with special focus on India
- (ii) Traditional Historiography and Feminist critiques; Social Reforms Movement and position of women in India, History of Women's struggle in Post- Independent India

UNIT-IV: Family in contemporary India and Understanding Woman's Work and Labour

- (i) Family in contemporary India - patrilineal and matrilineal practices. Gender Relations in the Family, Patterns of Consumption: Intra Household Divisions, entitlements and bargaining, Property Rights
- (ii) Understanding Woman's Work and Labour – Sexual Division of Labour, Productive and Reproductive labour, Visible - invisible work – Unpaid (reproductive and care), Underpaid and Paid work,- Methods of computing women's work , Female headed households

Text Books

1. Bina Agarwal, (2013) 'Gender And Green Governance', Oxford University Press, Oxford,
2. Forbes, Geraldine (1998) 'Women in Modern India'. Cambridge, Cambridge University Press
3. Geetha, V. (2002) 'Gender'. Calcutta, Stree Publications.
4. Geetha, V. (2007) 'Patriarchy'. Calcutta, Stree Publications.
5. Jagger, Alison. (1983) 'Feminist Politics and Human Nature'. U.K, Harvester Press.
6. John, Mary(2008) 'Women studies in India: A Reader', Peguin, New Delhi
7. Lerner, Gerda. (1986) 'Creation of Patriarchy'. New York. Oxford University Press.

Reference Books:

1. Banarjee, Sikata. (2007) 'Ghadiyally, Rehana. (ed.) 'Urban Women in Contemporary India: A Reader'. New Delhi, Sage.
2. Chakravarti, Uma. (1988) 'Beyond the Altekarian Paradigm: Towards a New Understanding of Gender Relations in Early Indian History', Social Scientist, Volume 16, No. 8.
3. Desai, Neera & Thakkar, Usha. (2001) 'Women in Indian Society'. New Delhi: National Book Trust.
4. Gandhi, Nandita & Shah, Nandita. (1991) 'Contemporary Women's Movement in India'. Delhi, Zubaan.
5. Gupta, A and Sinha Smita, (2005) 'Empowerment of women: Language and Other Facets', Mangal Deep, New Delhi.
6. Jayawardene, Kumari. (1986) 'Feminism and Nationalism in the Third World'. London, Zed Books and Conclusion.
7. Nayak, Smita (2016) (eds.) ' Combating Violence Against Women: A Reality in the Making', Kalpaz, Gyan Books Pvt, Ltd, New Delhi
8. Nayak, Smita (2016) (eds.) 'Gender Dynamics: The Emerging Frontiers', Research India Publications, New Delhi.
9. Nayak, Smita, (2016), 'Whither Women: A Shift from Endowment to Empowerment', Edupedia, New Delhi.
10. Rege, Sharmila. (2003) (ed.) 'The Sociology of Gender: The Challenge of Feminist Sociological Knowledge'. New Delhi, Sage.
11. Rowbotham, Shiela. (1993) 'Women in Movements', New York and London, Routledge.
12. Sangari, Kumkum & Chakravarty, Uma.(1999) (eds.) 'From Myths to Markets: Essays on Gender'. Delhi, Manohar.
13. Sarkar, Tanika & Butalia, Urvashi. (1995) (eds.) 'Women and the Hindu Right'. Delhi, Kali for Women.

2nd Year: (Semester- III & IV) : Paper: GE-PSC-A-2 & GE-PSC-B-2

Generic Elective Paper II GOVERNANCE: ISSUES AND CHALLENGES

Objectives: This paper deals with concepts and different dimensions of governance highlighting the major debates in the contemporary times. There is a need to understand the importance of the concept of governance in the context of a globalizing world, environment, administration, development. The essence of governance is explored through the various good governance initiatives introduced in India.

UNIT-I: Government and governance: concepts

- (i) Governance: Meaning, Nature and Types
- (ii) Role of State in the Era of Globalisation: State, Market and Civil Society

UNIT-II : Good Governance

- i) Good Governance
- ii) Sustainable Development and Governance

UNIT-III: Local Governance

- (i) Democratic Decentralization: Institutions of Local Governance (PRIs),
- (ii) People's Participation in Local Governance & Deepening Democracy

UNIT-IV : Good Governance Initiatives In India

- i) Public Service Guarantee Acts & Electronic Governance
- ii) Citizens Charter & Right to Information, Corporate Social Responsibility

Text Books

1. A Baviskar, ((1995) The Belly of the River: Tribal Conflict Over Development in the Narmada Valley', Delhi, Oxford University Press.
2. A. Parel (2000) (ed) 'Gandhi, Freedom and Self-Rule', New Delhi, Lexington Books.
3. B. Parekh, (1997) 'Gandhi: A Brief Insight', Delhi, Sterling Publishing Company.
4. B. Parekh, (1999) 'Colonialism, Tradition and Reform: An Analysis of Gandhi's Political Discourse', New Delhi, Sage Publication.
5. D. Hardiman, (2003) 'Gandhi in his Time and Ours'. Delhi, Oxford University Press.

Reference Books

1. R Iyer, (ed) (1993) 'The Essential Writings of Mahatma Gandhi', New Delhi, Oxford University Press.
2. R. Ramashray, (1984) 'Self and Society: A Study in Gandhian Thought', New Delhi, Sage Publication.

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GE: Subject: SANSKRIT (SANS)

[Universities where 2 subjects of two papers each are offered can offer GE1 and GE2.]

(copied from page 6, 10, 13 of Sanskrit model syllabus)

GENERIC ELECTIVE (GE)

04 Papers in Generic Elective such as 1, 2, 3 & 4

(One examinee may choose SANSKRIT as GE- A or GE-B)

GE- 1 KHANDAKAVYA & DARSANA -KAVYA

80+20 = 100 Marks

- | | |
|-----------------------------|----|
| 1. Meghadutam- (Purvamegha) | 60 |
| 2. Bhagavatagita(Ch.XV) | 20 |

GE-2 MORAL TEACHING AND BASICS OF SANSKRIT 80+20 = 100 Marks

- | | |
|---|----|
| 1. Hitopadesa | 32 |
| 2. Yaksaprasna of Mahabharata (Aranyakaparva, ch.313) | 32 |
| 3. Sabdarupa & Dhaturupa | 16 |

1st Year: (Semester- I & II) : Paper: GE-SANS-A-1 & GE-SANS-B-1

GENERIC ELECTIVE -1

KHANDAKAVYA & DARSANAKAVYA

80 +20 = 100 Marks

1. Meghadutam (Purvamegha)	60 Marks
2. Gita (Chapter.XV)	20 Marks
1. Meghadutam- (Purvamegha)	60 Marks
Unit-I Long Question – 2 (About 150 words each)	12 x 2= 24 Marks
Unit- II Short Questions - 4(About 50 words each)	5 x 4 = 20Marks
Unit-III i) Explanation of One Verse (About 150 words)	10 Marks
ii) Translation of One Verse into Odia/ English	06 marks
2.Bhagavadgita (Chap.XV)	20 Marks
Unit-IV Long Question - 1(About 150 words)	12Marks
Explanation of One Verse (About 150 words)	08 Marks

Core Reading:

1. Meghadutam (Ed.) M.R. Kale, Motilal Banarsidass, Delhi
2. Shrimad-bhagavad-gita, Gita Press, Gorakhpur

Suggested Reading:

1. Meghadutam (Ed.) B.S. Mishra, Vidyapuri, Cuttack, 1st Edn-1999
2. Meghadutam (Ed.) Radhamohan Mahapatra, Books and Books, Vinodvihari, Cuttack, 1984
3. Shrimad-bhagavad-gita (Ed.) S. Radhakrishnan, Bharatiya Vidya Bhavan
4. Shrimad-bhagavad-gita (Ed.) Gambhirananda, Ramakrishna Mission

2nd Year: (Semester- III & IV) : Paper: GE-SANS-A-2 & GE-SANS-B-2

GENERIC ELECTIVE -2

MORAL TEACHINGS AND BASICS OF SANSKRIT

80+20 = 100 Marks

- | | |
|---|----------|
| 1. <i>Hitopadeśa Mitralabha</i> (<i>Prastavana, Kathāmukha, Brddhavyaghrapathiakakatha, Mrgajambukakatha & Gṛdhravidalakatha</i>) | 32 Marks |
| 2. <i>Yaksaprasna of Mahabharata</i> (<i>Aranyakaparva, ch.313 from Verses no. 41 to 133</i>) | 32 Marks |
| 3. <i>Śabdarupa & Dhaturupa</i> | 16 Marks |

('a' karanta, 'i' karanta, 'ī' karanta, 'u' karanta, 'ū' karanta, 'in' bhaganta, Mātṛ, Pitṛ, Asmad, Yusmad, Tad(Sabdarupas).

Lat, Lan, Vidhiliṇ, Lṛt, Lot and Litlakaras path, Ni, Kṛ, Sev, Han, Pā, Dā, Śru, Śī and Krīṇ in the form of Ātmanepada, Parasmaipada or Ubhayapada whichever is applicable. (Dhaturupas)

Unit-I & II *Hitopadeśa Mitralabha and Sabdarupa*

40 Marks

Long Question -1 (About 300 words)

16 Marks

Short Questions -2 (About 50 words each)

5×2=10 Marks

Translation of a textual verse

6 Marks

Sabdarupa – 4

2 x 4 = 8 Marks

Unit-III & IV *Yaksaprasna of Mahabharata and Dhaturupa*

40 Marks

Long Question-1 (About 300 words)

16 Marks

Explanation - 1 (About 150 words)

10 Marks

Translation of a textual verse

6 Marks

Dhaturupa – 4

2 x 4 = 8 Marks

Core Readings :

1. *Hitopadesah (Mitralabhah)* (Ed.) Kapildev Giri, Chaukhamba Publications, Varanasi.
2. *Mahabharata*, Gitapress, Gorakhpur (Prescribed Text)
3. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar, 2013

Suggested Readings :

1. *Hitopadesah (Mitralabhah)* (Ed.) N.P. Dash and N.S. Mishra, Kalyani Publishers, New Delhi
2. *Hitopadesah (Mitralabhah)* (Ed.) B.S. Mishra, Vidyapuri, Cuttack
3. *Yaksaprasna*, T. K. Ramaayiyar, R. S. Vadhyar & Sons. Palkad, Kerala
4. *Yaksaprasna*, Ed. Dr. Nirmal Sundar Mishra, A.K. Mishra Agency, Cuttack, 2016

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GE: Subject: **SOCIOLOGY (SOC)**

[Universities where 2 subjects of two papers each are offered can offer GE1 and GE2.] (page-3)
(copied from page 3, 29, 30, 31 of Sociology model CBCS syllabus)

1st Year: (Semester- I & II) : Paper: GE-SOC-A-1 & GE-SOC-B-1

GENERIC ELECTIVE PAPER I INTRODUCTION TO SOCIOLOGY

This **introductory paper** intends to acquaint the students with Sociology as a Social Science and the basic concepts used in the discipline. It also focuses on the social processes and the social institutions that man encounters as a member of the society.

Objectives: After studying these two papers, the student can

- Get to know the convergence and divergence of Sociology with other social science disciplines in terms of the subject matter, nature and scope of the discipline and its approach.
- Develop knowledge about its historicity.
- Can get acquainted with the basic concepts used in the subject.
- Can generate ideas about the social processes and social institutions man encounters as a member of the society.

Learning Outcomes: This paper is expected to clarify and broaden the student's notion about the subject, the basic concepts used and some universal societal processes. This will provide a wholesome picture about what the subject is all about.

Unit-1: Discipline and Perspective

- 1.1 Meaning, Emergence of Sociology
- 1.2 Definition, Subject Matter
- 1.3 Nature and Scope of Sociology
- 1.4 Relationship of Sociology with Anthropology, Political Science, History and Economics

Unit-2: Basic Concepts

- 2.1 Society and Community
- 2.2 Associations and Institutions
- 2.3 Social Groups and Culture
- 2.4 Role and Status

Unit-3: Social Stratification

- 3.1 Meaning, Definition, Characteristics
- 3.2 Forms of Stratification-Caste, class & gender
- 3.3 Functionalist Theorists of stratification (Parsons, Davis & Moore)
- 3.4 Marxian & Weberian Theories of stratification

Unit-4: Socialization and Social Control

- 4.1 Meaning, Definitions, Stages of Socialization Process.
- 4.2. Agencies of Socialization
- 4.3 Social Control: Meaning, Definitions, importance of social control
- 4.4 Agencies of Social Control: Formal and Informal

Suggested Text Books:

1. Rao ,C.N.Shankar, Principles of Sociology: With an Introduction to Social Thought, S.Chand & Co. Pvt. Ltd.(Revised ed.), 2006
2. Haralambos & Holborn , Sociology: Themes and Perspectives Harper Collins; Eighth edition, 2014

Reference Readings:

1. Mills, C.W., *The Sociological Imagination*, Oxford: Oxford University Press, 1959.
2. Giddens ,Anthony, Introduction to Sociology, 1991
3. Rawat, H.K. Contemporary Sociology, Rawat Publication, Jaipur, 2013
- 4 Johnson, Harry M. Sociology: A Systematic Introduction, New Delhi, Allied Publishers, 1995
5. Smelser Neil J. *Hand Book of Sociology*, Sage Publications, Inc. 1998
6. Dasgupta, Samir and Saha, Paulomi An Introduction to Sociology, Pearson, 2014

2nd Year: (Semester- III & IV) : Paper: GE-SOC-A-2 & GE-SOC-B-2

GENERIC ELECTIVE PAPER II INDIAN SOCIETY

Every society has its own peculiar structure and there are some institutions universal to every society, but with their unique manifestations in each society. There are some change agents and initiatives that enable the society to change with the passage of time. This paper focuses on the structure of the Indian society and the changing aspects with the processes operating, change agents and initiatives.

Objectives: After studying these two papers on Indian society, the student can

- Get an impression about the basic composition of Indian society, its historical moorings, basic philosophical foundations of the society and the institutions.
- Learn about the changing institutions, the processes, the agents and the interventions that bring about change in the Indian society.

Learning Outcomes: This paper is expected to bring familiarity in a student about Indian society. It will present a comprehensive, integrated and empirically –based profile of Indian society. It is hoped that the structure and processes operative in the society, the change agents operating in Indian society presented in this course will also enable students to gain a better understanding of their own situation and region.

Unit-1: Composition of Indian Society and Approaches to the study of Indian society:

- 1.1 Composition of Indian Society: Religious, Linguistic and Racial
- 1.2 Unity in diversity
- 1.3 National Integration--Meaning & Threats (Communalism, linguism, regionalism)
- 1.4 Approaches to the study of Indian society: Structural-Functional, Marxian and Subaltern

Unit-2: Historical Moorings and Bases of Hindu Social Organization

- 2.1 Varna Vyavastha and relevance
- 2.2 Ashrama and relevance
- 2.3 Purusartha and relationship with Ashramas
- 2.4 Doctrine of Karma

Unit-3: Marriage and Family in India

- 3.1 Hindu Marriage as Sacrament, Aims of Hindu marriage, Forms of Hindu Marriage
- 3.2 Hindu Joint Family-Meaning & disintegration
- 3.3 Marriage among the Muslims & Tribes
- 3.4 Changes in Marriage and Family in India

Unit-4: The Caste System in India

- 4.1 Meaning, Definitions & features of Caste
- 4.2 Functions & Dysfunctions of Caste
- 4.3 Factors affecting caste system
- 4.4 Recent Changes in Caste System

Suggested Text Book:

1. Rao, C.N. Shankar, Sociology of Indian Society, S.Chand & Co. Pvt. Ltd. (Revised ed.), 2004

Reference Readings:

1. Shah, A.M., The Household Dimension of the Family in India: A Field Study in a Gujarat Village and a Review of Other Studies, Delhi: Orient Longman, 1973.
2. Uberoi, P. (ed.), Family, Kinship and Marriage in India, New Delhi: Oxford University Press, 1993.
3. Y. Singh, Modernisation of Indian Tradition, Jaipur: Rawat Publications, 1986
4. Ram Ahuja, Indian Social System, Rawat Publications, 1993
5. Sharma, K.L. Indian Social Structure and Change, Rawat Publication, 2008
6. Srinivas, M.N. India: Social Structure. New Delhi: Hindustan Publishing Corporation, 1980

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GE: SCIENCE

GE Subject: BOTANY (BOT)

*[Incase University offers 2 subjects as GE, then papers 1 and 2 will be the GE paper.] (page-5)
(copied from page 5, 33, 34, 35, 36 of Botany model CBCS syllabus)*

1st year: (Semester- I & II) : Paper: GE-BOT-A-1 & GE-BOT-B-1

Generic Elective Paper I

BIODIVERSITY (MICROBES, ALGAE, FUNGI AND ARCHEGONIATES)

Unit-I

Microbes : Viruses – Discovery, general structure, replication (general account), DNA virus (T-phage); Lytic and lysogenic cycle, RNA virus (TMV); Economic importance; Bacteria – Discovery, General characteristics and cell structure; Reproduction – vegetative, asexual and recombination (conjugation, transformation and transduction); Economic importance.

Unit-II

(i) Algae: General characteristics; Ecology and distribution; Range of thallus organization and reproduction; Morphology and life- cycles of the following: *Chlamydomonas*, *Oedogonium*, *Nostoc* and *Fucus*, *Vaucheria*, *Polysiphonia*, Economic importance of algae.

(ii) Fungi : Introduction- General characteristics, ecology and significance, range of thallus organization, cell wall composition , nutrition, reproduction and classification; True Fungi- General characteristics, ecology and significance, life cycle of *Rhizopus* (Zygomycota) *Penicillium* (Ascomycota), *Puccinia*, *Agaricus* Basidiomycota); Symbiotic Associations-Lichens:

Unit-III

(i) **Bryophytes:** General characteristics, adaptations to land habit, Classification, Range of thallus organization, Classification (up to family), morphology, anatomy and reproduction of *Marchantia* and *Funaria* (Developmental details not to be included).

(ii) **Pteridophytes:** General characteristics, classification, early land plants (*Rhynia*). Classification (up to family), morphology, anatomy and reproduction of *Selaginella*, *Equisetum* and *Pteris* (Developmental details not to be included). Heterospory and seed habit, stellar evolution. Ecological and economical importance of Pteridophytes.

Unit-IV

Gymnosperms: General characteristics, classification. Classification (up to family), morphology, anatomy and reproduction of *Cycas*, *Pinus* and *Gnetum*. (Developmental details not to be included). Ecological and economical importance.

PRACTICAL

1. Gram staining
2. Study of vegetative and reproductive structures of *Nostoc*, *Chlamydomonas*, *Oedogonium*, *Vaucheria*, *Fucus* and *Polysiphonia* through temporary preparations and permanent slides.
3. *Rhizopus* and *Penicillium*: Asexual stage from temporary mounts and sexual structures through permanent slides.
4. *Puccinia* and *Agaricus*: Specimens of button stage and full grown mushroom; Sectioning of gills of *Agaricus*.
5. *Marchantia* and *Funaria*- morphology of thallus, w.m. rhizoids and scales, v.s. thallus through gemma cup, w.m. gemmae (all temporary slides), v.s. antheridiophore, archegoniophore, l.s. sporophyte (all permanent slides).
6. *Selaginella*- morphology, w.m. leaf with ligule, t.s. stem, w.m. strobilus, w.m. microsporophyll and megasporophyll (temporary slides), l.s. strobilus (permanent slide).
7. *Equisetum*- morphology, t.s. internode, l.s. strobilus, t.s. strobilus, w.m. sporangiophore, w.m. spores (wet and dry)(temporary slides); t.s. rhizome (permanent slide).
8. *Cycas*- morphology (coralloid roots, bulbil, leaf), t.s. coralloid root, t.s. rachis, v.s. leaflet, v.s. microsporophyll, w.m. spores (temporary slides), l.s. ovule, t.s. root (permanent slide).
9. *Pinus*- morphology (long and dwarf shoots, w.m. dwarf shoot, male and female), w.m. dwarf shoot, t.s. needle, t.s. stem, , l.s./t.s. male cone, w.m. microsporophyll, w.m. microspores (temporary slides), l.s. female cone, t.l.s. & r.l.s. stem (permanent slide).

Text Books:

1. Mitra, J.N., Mitra, D. and Choudhury, S.K. Studies in Botany Volume 1. Moulik Publisher, Kolkata. Ninth Revised Edition

Reference Books:

- 1.Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West. Press Pvt. Ltd. Delhi. 2nd edition.
- 2.Tortora, G.J., Funke, B.R., Case, C.L. (2010). Microbiology: An Introduction, Pearson Benjamin Cummings, U.S.A. 10th edition.
- 3.Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi & Their Allies, Mac Millan Publishers Pvt. Ltd., Delhi.
- 4.Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley and Sons (Asia), Singapore. 4th edition.
- 5.Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R., (2005). Biology. Tata McGraw Hill, Delhi, India.
- 6.Vashishta, P.C., Sinha, A.K., Kumar, A., (2010). Pteridophyta, S. Chand. Delhi, India.
- 7.Bhatnagar, S.P. and Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd Publishers, New Delhi, India.
- 8.Parihar, N.S. (1991). An introduction to Embryophyta. Vol. I. Bryophyta. Central Book Depot, Allahabad.
- 9.Pandey, B. P. (2017), Botany for degree studies (as per CBCS). S. Chand
10. Acharya, B. S. and Mishra, B. K. (2018). Plant Biodiversity, Kalyani Publishers, New Delhi.

2nd Year: (Semester- III & IV) : Paper: GE-BOT-A-2 & GE-BOT-B-2**Generic Elective Paper II
PLANT PHYSIOLOGY AND METABOLISM****Unit-I**

- (i) Plant-water relations: Importance of water, water potential and its components; Transpiration and its significance; Factors affecting transpiration; Root pressure and guttation.
- (ii) Mineral nutrition: Essential elements, macro and micronutrients; Criteria of essentiality of elements; Role of essential elements; Transport of ions across cell membrane, active and passive transport, carriers, channels and pumps.
- (iii) Translocation in phloem.: Composition of phloem sap, girdling experiment; Pressure flow model; Phloem loading and unloading.

Unit-II

- (i) Photosynthesis: Photosynthetic Pigments (*Chl a*, *b*, xanthophylls, carotene); Photosystem I and II, reaction center, antenna molecules; Electron transport and mechanism of ATP synthesis; C₃, C₄ and CAM pathways of carbon fixation.
- (ii) Respiration: Glycolysis, anaerobic respiration, TCA cycle; Oxidative Phosphorylation.

Unit-III

- (i) Enzymes: Structure and properties; Mechanism of enzyme catalysis and enzyme inhibition.
- (ii) Nitrogen metabolism: Biological nitrogen fixation; Nitrate and ammonia assimilation.

Unit-IV

- (i) Plant growth regulators: Discovery and physiological roles of auxins, gibberellins, cytokinins, ABA, ethylene.

(ii) Plant response to light and temperature: Photoperiodism (SDP, LDP, Day neutral plants); Phytochrome (discovery and structure), red and far red light responses on photomorphogenesis; Vernalization.

PRACTICAL

1. Determination of osmotic potential of plant cell sap by plasmolytic method.
2. To study the effect of two environmental factors (light and wind) on transpiration by excised twig.
3. Calculation of stomatal index and stomatal frequency of a mesophyte and a xerophyte.
4. Demonstration of Hill reaction.
5. Demonstrate the activity of catalase and study the effect of pH and enzyme concentration.
6. To study the effect of light intensity and bicarbonate concentration on O₂ evolution in photosynthesis.
7. Comparison of the rate of respiration in any two parts of a plant.

Text Books:

1. A. C. Sahu (2018). Plant Physiology and Metabolism. Kalyani Publishers, New Delhi.

Reference Books:

1. Taiz, L., Zeiger, E., Moller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.
2. Hopkins, W.G., Huner, N.P., (2009). Introduction to Plant Physiology. John Wiley & Sons, U.S.A. 4th Edition.
3. Bajracharya, D., (1999). Experiments in Plant Physiology- A Laboratory Manual. Narosa Publishing House, New Delhi.
4. H. S. Srivastava. Plant Physiology, Rastogi Publications, New Delhi

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GE: Subject: CHEMISTRY (CHEM)

*[Universities where 2 subjects of two papers each are offered can offer GE1 and GE2.](page-4)
(copied from page 4, 57 to 63 of Chemistry Model CBCS syllabus)*

1st year: (Semester- I & II) : Paper: GE-CHEM-A-1 & GE-CHEM-B-1

**Generic Elective Paper I (Theory)
ATOMIC STRUCTURE, BONDING, GENERAL ORGANIC CHEMISTRY &
ALIPHATIC HYDROCARBONS**

Section A: Inorganic Chemistry-I

Unit-I: Atomic Structure

Review of: Bohr's theory and its limitations, dual behaviour of matter and radiation, de-Broglie's relation, Heisenberg Uncertainty principle. Hydrogen atom spectra.

Quantum mechanics: Time independent Schrodinger equation and meaning of various terms in it. Significance of ψ and ψ^2 , Schrodinger equation for hydrogen atom. Radial and angular parts of the hydrogenic wave functions (atomic orbitals) and their variations for 1s, 2s, 2p, 3s, 3p and 3d orbitals (Only graphical representation). Quantum numbers and their significance, shapes of s, p and d atomic orbitals, nodal planes.

Rules for filling electrons in various orbitals, Electronic configurations of the atoms. Stability of half-filled and completely filled orbitals, concept of exchange energy. Relative energies of atomic orbital, Anomalous electronic configurations.

Unit-II: Chemical Bonding and Molecular Structure

Ionic Bonding: General characteristics, energy considerations. Lattice energy and hydration energy and their importance in the context of stability and solubility of ionic compounds. Statement of Born-Landé equation for calculation of lattice energy, Born-Haber cycle and its applications, polarizing power and polarizability. Fajan's rules and its applications.

Covalent bonding: VB Approach: Shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements.

Concept of resonance and resonating structures in various inorganic and organic compounds. MO Approach: Rules for the LCAO method, bonding and antibonding MOs and their characteristics for *s-s*, *s-p* and *p-p* combinations of atomic orbitals, nonbonding combination of orbitals, MO treatment of homonuclear diatomic molecules (N₂, O₂) and heteronuclear diatomic molecules (CO, NO). Comparison of VB and MO approaches.

Section B: Organic Chemistry-I

Unit- III: Fundamentals of Organic Chemistry

Physical Effects, Electronic Displacements: Inductive effect, Electrometric effect, Resonance and hyperconjugation. Cleavage of bonds: Homolysis and heterolysis.

Structure, shape and reactivity of organic molecules: Nucleophiles and electrophiles. Reactive Intermediates: Carbocations, Carbanions and free radicals.

Strength of organic acids and bases: Comparative study with emphasis on factors affecting pK values. Aromaticity: Huckel's rule.

Stereochemistry

Conformations with respect to ethane, butane and cyclohexane. Interconversion of Wedge Formula, Newmann, Sawhorse and Fischer representations. Concept of chirality (up to two carbon atoms). Configuration: Geometrical and Optical isomerism; Enantiomerism, Diastereomerism and Meso compounds). D and L; cis-trans nomenclature; CIP Rules: R/ S (for one chiral carbon atoms) and E / Z Nomenclature (for up to two C=C systems).

Unit-IV: Aliphatic Hydrocarbons

Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure.

Alkanes: (Up to 5 Carbons) *Preparation:* Catalytic hydrogenation, Wurtz reaction, Kolbe's synthesis, from Grignard reagent. *Reactions:* Free radical Substitution: Halogenation.

Alkenes: (Up to 5 Carbons) *Preparation:* Elimination reactions: Dehydration of alkenes and dehydrohalogenation of alkyl halides (Saytzeff's rule); cis-alkenes (Partial catalytic hydrogenation) and trans-alkenes (Birch reduction). *Reactions:* cis-addition (alk. KMnO₄) and trans-addition (bromine), Addition of HX (Markownikoff's and anti- Markownikoff's addition), Hydration, Ozonolysis.

Alkynes: (Up to 5 Carbons) *Preparation:* Acetylene from CaC₂ and conversion into higher alkynes; by dehalogenation of tetra halides and dehydrohalogenation of vicinal-dihalides. *Reactions:* formation of metal acetylides, addition of bromine and alkaline KMnO₄,ozonolysis.

Recommended Text Books:

1. Lee J. D., Concise Inorganic Chemistry, Wiley India, 5thEdn., 2008.
2. Puri, Sharma, Kalia, Principles of Inorganic Chemistry, Vishal Pub. Co., 33rd Ed., 2017.
3. Shriver D. E., Atkins P. W., Inorganic Chemistry, Oxford University Press, 5th Edn.

- Huheey J. E., Keiter E. A. and Keiter R. L., Inorganic Chemistry – Principles of structure and reactivity, Pearson Education, 4th Ed. 2002.
- Morrison, R. N. & Boyd, R. N., Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Bhal Arun & Bhal B S , Advanced Organic Chemistry, 2nd Edition, S. Chand Publisher, 2012.
- Kalsi, P. S. Stereochemistry Conformation and Mechanism; 8th Edn, New Age International, 2015.

Reference books

- Das Asim K., Fundamentals of Inorganic Chemistry, Vol. II, CBS Publications, 2nd Ed. 2010.
- Pradeep's Inorganic Chemistry, Vol. I & II, Universal Book seller, 14th Ed. 2017.
- Mallick, Madan and Tuli, S. Chand Selected Topic in Inorganic Chemistry, 17thEdn. 2010.
- Dhawan, S.N., Pradeep's Organic Chemistry, (Vol. I and II), Pradeep Publications.

Generic Elective Paper I LAB Section A: Inorganic Chemistry

Volumetric Analysis

- Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.
- Estimation of oxalic acid by titrating it with KMnO_4 .
- Estimation of water of crystallization in Mohr's salt by titrating with KMnO_4 .
- Estimation of Fe(II) ions by titrating it with $\text{K}_2\text{Cr}_2\text{O}_7$ using internal indicator.
- Estimation of Cu(II) ions iodometrically using $\text{Na}_2\text{S}_2\text{O}_3$.

Section B: Organic Chemistry

- Detection of extra elements (N, S, Cl) in organic compounds (containing up to two extra elements)
- Separation of mixtures by Chromatography: Measure the R_f value in each case (combination of two compounds to be given)
 - Identify and separate the components of a given mixture of 2 amino acids (glycine, aspartic acid, glutamic acid, tyrosine or any other amino acid) by paper chromatography.
 - Identify and separate the sugars present in the given mixture by paper chromatography.

Reference Books:

- Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009.
- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
- Ahluwalia, V.K., Dhingra, S. and Gulati A, College Practical Chemistry, University Press (2005).

2nd Year: (Semester- III & IV) : Paper: GE-CHEM-A-2 & GE-CHEM-B-2

Generic Elective Paper II (Theory)
CHEMICAL ENERGETICS, EQUILIBRIA & FUNCTIONAL ORGANIC CHEMISTRY

Section A: Physical Chemistry-I

Unit-I: Chemical Energetics

Review of thermodynamics and the Laws of Thermodynamics.

Important principles and definitions of thermochemistry. Concept of standard state and standard enthalpies of formations, integral and differential enthalpies of solution and dilution. Calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data. Variation of enthalpy of a reaction with temperature – Kirchhoff's equation.

Statement of Third Law of thermodynamics.

Chemical Equilibrium

Free energy change in a chemical reaction. Thermodynamic derivation of the law of chemical equilibrium.

Distinction between ΔG and ΔG° , Le Chatelier's principle. Relationships between

K_p , K_c and K_x for reactions involving ideal gases.

Unit- II: Ionic Equilibria

Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect. Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions. Solubility and solubility product of sparingly soluble salts – applications of solubility product principle.

Section B: Organic Chemistry-II

Unit- III

Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure.

Aromatic hydrocarbons

Preparation (Case benzene): from phenol, by decarboxylation, from acetylene, from benzene sulphonic acid.

Reactions: (Case benzene): Electrophilic substitution: nitration, halogenation and sulphonation. Friedel-Craft's reaction (alkylation and acylation) (up to 4 carbons on benzene).

Side chain oxidation of alkyl benzenes (up to 4 carbons on benzene).

Alkyl and Aryl Halides

Alkyl Halides (Up to 5 Carbons) Types of Nucleophilic Substitution (SN_1 , SN_2 and SN_i) reactions.

Preparation: from alkenes and alcohols. Reactions: hydrolysis, nitrite & nitro formation, nitrile & isonitrile formation. Williamson's ether synthesis: Elimination vs substitution.

Aryl Halides Preparation: (Chloro, bromo and iodo-benzene case): from phenol, Sandmeyer & Gattermann reactions.

Reactions (Chlorobenzene): Aromatic nucleophilic substitution (replacement by $-OH$ group) and effect of nitro substituent. Benzyne Mechanism: KNH_2/NH_3 (or $NaNH_2/NH_3$).

Unit- IV

Alcohols, Phenols and Ethers (Up to 5 Carbons)

Alcohols: Preparation: Preparation of 1°, 2° and 3° alcohols: using Grignard reagent, Ester hydrolysis, Reduction of aldehydes and ketones, carboxylic acid and esters.

Reactions: With sodium, HX (Lucas test), esterification, oxidation (with PCC, Alk. KMnO₄, acidic dichromate, conc. HNO₃). Oppeneauer oxidation Diols: (Up to 6 Carbons) oxidation of diols. Pinacol-Pinacolone rearrangement

Phenols: (Phenol case) Preparation: Cumene hydroperoxide method, from diazonium salts.

Reactions: Electrophilic substitution: Nitration, halogenation and sulphonation. Reimer Tiemann Reaction, Gattermann -Koch Reaction,

Ethers (aliphatic and aromatic): Cleavage of ethers with HI.

Aldehydes and ketones (aliphatic and aromatic): Formaldehyde, acetaldehyde, acetone and benzaldehyde

Preparation: from acid chlorides and from nitriles.

Reactions – Reaction with HCN, ROH, NaHSO₃, NH₂-G derivatives. Iodoform test. Aldol Condensation, Cannizzaro's reaction, Benzoin condensation. Clemensen reduction and Wolff Kishner reduction.

Recommended Text Books:

1. Atkins P. W. & Paula, J. de, Elements of Physical Chemistry, Oxford University Press, 6th Ed., (2006).
2. Principles of Physical Chemistry, Puri, Sharma & Pathania, Vishal Publishing Co, 47th Edn. 2017.
3. K. L. Kapoor, Text Book of Physical Chemistry, Mac Grow Hill, 3rdEdn. 2017.
4. Morrison, R. N. & Boyd, R. N., Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
5. Arun Bahl & B S Bahl, Advanced Organic Chemistry, 2nd Edition, S. Chand Publisher, 2012.

Reference Books:

1. Kheterpal S.C., Pradeep's Physical Chemistry, Vol. I & II, Pradeep Publications.
2. Dhawan, S.N., Pradeep's Organic Chemistry, (Vol. I and II), Pradeep Publications

Generic Elective Paper II LAB**Section A: Physical Chemistry****Thermochemistry (any three)**

1. Determination of heat capacity of calorimeter for different volumes.
2. Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
3. Determination of enthalpy of ionization of acetic acid.
4. Determination of integral enthalpy of solution of salts (KNO₃, NH₄Cl).
5. Determination of enthalpy of hydration of copper sulphate.
6. Study of the solubility of benzoic acid in water and determination of ΔH .

Ionic equilibria

pH measurements

a) Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps (use dilute solutions of soaps and shampoos to prevent damage to the glass electrode) using pH-meter.

b) Preparation of buffer solutions:

- Sodium acetate-acetic acid
- Ammonium chloride-ammonium hydroxide

Measurement of the pH of buffer solutions and comparison of the values with theoretical values.

Section B: Organic Chemistry

1. Purification of organic compounds by crystallization (from water) and determination of melting.
2. Preparations, recrystallisation, determination of melting point and calculation of quantitative yields of the followings:

(a) Bromination of Phenol/Aniline

(b) Benzoylation of amines/phenols

(c) Oxime and 2,4 dinitrophenylhydrazone of aldehyde/ketone.

Reference Books

1. A.I. Vogel: Textbook of Practical Organic Chemistry, 5th edition, Prentice-Hall.
2. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
3. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co., New Delhi (2011).
4. Ahluwalia, V.K., Dhingra, S. and Gulati A, College Practical Chemistry, University Press (2005).

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GE: Subject: COMPUTER SCIENCE (C SC)

GENERIC ELECTIVES (TWO PAPER CHOICE)

(copied from page 37 to 43 of Computer Science Model CBCS syllabus)

1st year: (Semester- I & II) : Paper: GE-CSC-A-1 & GE-CSC-B-1

Generic Elective Paper I

COMPUTER FUNDAMENTALS

OBJECTIVES:

- ☐ To make the students understand and learn the basics of computer.
- ☐ To make them familiar with the parts and functions of computer.
- ☐ To learn the features of some emerging technologies.

Unit-1

Introduction: Introduction to computer system, uses, types.

Data Representation: Number systems and character representation, binary arithmetic

Human Computer Interface: Types of software, Operating system as user interface, utility programs

Unit-2

Devices: Input and output devices (with connections and practical demo), keyboard, mouse, joystick, scanner, OCR, OMR, bar code reader, web camera, monitor, printer, plotter

Memory: Primary, secondary, auxiliary memory, RAM, ROM, cache memory, hard disks, optical disks

Unit-3

Computer Organisation and Architecture: C.P.U., registers, system bus, main memory unit, cache memory, Inside a computer, SMPS, Motherboard, Ports and Interfaces, expansion cards, ribbon cables, memory chips, processors.

Unit-4

Overview of Emerging Technologies: Bluetooth, cloud computing, big data, data mining, mobile computing and embedded systems.

Text Books:

1. A. Goel, Computer Fundamentals, Pearson Education, 2010.

Reference Books:

1. P. Aksoy, L. DeNardis, Introduction to Information Technology, Cengage Learning, 2006
2. P. K. Sinha, P. Sinha, Fundamentals of Computers, BPB Publishers, 2007

Generic Elective Paper I Practical: Computer Fundamentals Lab

Practical exercises based on **MS Office tools** including document preparation and spreadsheet handling packages.

MS Word:

1. Prepare a grocery list having four columns (Serial number, The name of the product, quantity and price) for the month of February, 2019.
 - Font specifications for Title (Grocery List): 14-point Arial font in bold and italics.
 - The headings of the columns should be in 12-point and bold.
 - The rest of the document should be in 10-point Times New Roman.
 - Leave a gap of 12-points after the title.
2. Create a telephone directory.
 - The heading should be 16-point Arial Font in bold
 - The rest of the document should use 10-point font size
 - Other headings should use 10-point Courier New Font.
 - The footer should show the page number as well as the date last updated.
3. Design a time-table form for your college.
 - The first line should mention the name of the college in 16-point Arial Font and should be bold.

- The second line should give the course name/teacher's name and the department in 14-point Arial.

4. Create the following documents:

- A newsletter with a headline and 2 columns in portrait orientation, including at least one image surrounded by text.
- Use a newsletter format to promote upcoming projects or events in your classroom or college.

5. Enter the following data into a table given below:

Salesperson	Dolls	Trucks	Puzzles
Kennedy, Sally	1327	1423	1193
White, Pete	1421	3863	2934
Pillar, James	5214	3247	5467
York, George	2190	1278	1928
Banks, Jennifer	1201	2528	1203
Atwater, Kelly	4098	3079	2067

Add a column Region (values: S, N, N, S, S, S) between the Salesperson and Dolls columns to the given table Sort your table data by Region and within Region by Salesperson in ascending order: In this exercise, you will add a new row to your table, place the word "Total" at the bottom of the Salesperson column, and sum the Dolls, Trucks, and Puzzles columns.

MS Excel:

6. Given the following worksheet

	A	B	C	D
1	Roll No.	Name	Marks	Grade
2	1001	Sachin	99	
3	1002	Sehwag	65	
4	1003	Rahul	41	
5	1004	Sourav	89	
6	1005	Har Bhajan	56	

Calculate the grade of these students on the basis of following guidelines:

If Marks	Then Grade
≥ 80	A+
$\geq 60 < 80$	A
$\geq 50 < 60$	B
< 50	F

7. Given the following worksheet

Allowances

- HRA Dependent on Basic
 - 30% of Basic if Basic \leq 1000
 - 25% of Basic if Basic > 1000 & Basic \leq 3000
 - 20% of Basic if Basic > 3000
- DA Fixed for all employees, 30% of Basic
- Conveyance Allowance Rs. 50/- if Basic is \leq 1000
Rs. 75/- if Basic > 1000 & Basic \leq 2000
Rs. 100 if Basic > 2000
- Entertainment Allowance NIL if Basic is \leq 1000
Rs. 100/- if Basic > 1000

Deductions

- Provident Fund 6% of Basic
- Group Insurance Premium Rs. 40/- if Basic is \leq 1500
Rs. 60/- if Basic > 1500 & Basic \leq 3000
Rs. 80/- if Basic > 3000

Calculate the following:

Gross Salary = Basic + HRA + DA + Conveyance + Entertainment

Total deduction = Provident Fund + Group Insurance Premium

Net Salary = Gross Salary – Total Deduction

10.

The following table gives year wise sale figure of five salesmen in Rs.

Salesman	2000	2001	2002	2003
S1	10000	12000	20000	50000
S2	15000	18000	50000	60000
S3	20000	22000	70000	70000
S4	30000	30000	100000	80000
S5	40000	45000	125000	90000

- Calculate total sale year wise.
- Calculate the net sale made by each salesman
- Calculate the maximum sale made by the salesman
- Calculate the commission for each salesman under the condition.
 - If total sales > 4,00,000 give 5% commission on total sale made by the salesman.
 - Otherwise give 2% commission.
- Draw a bar graph representing the sale made by each salesman.
- Draw a pie graph representing the sale made by salesman in 2000.

2nd Year: (Semester- III & IV) : Paper: GE-CSC-A-2 & GE-CSC-B-2

Generic Elective Paper II C AND DATA STRUCTURE

OBJECTIVES:

- ☐ To learn the basics of C programming language.
- ☐ To understand the fundamentals of linear data structure.
- ☐ To be able write simple C and data structure programs.

Unit-1

Algorithm, flowchart, program development steps, structure of C program, A Simple C program, identifiers, basic data types and sizes, Constants, variables, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bit-wise operators, Assignment operators, expressions, type conversions, conditional expressions, precedence and order of evaluation. Input-output statements, statements and blocks, if and switch statements, oops- while, do-while and for statements, break, continue, goto and labels, programming examples.

Unit-2

Designing structured programs, Functions, basics, parameter passing, storage classes- extern, auto, register, static, scope rules, block structure, user defined functions, standard library functions, recursive functions, header files, C preprocessor, example c programs.

Unit-3

Arrays- concepts, declaration, definition, accessing elements, storing elements, arrays and functions, two-dimensional and multi-dimensional arrays, applications of arrays. Pointers concepts, initialization of pointer variables, pointers and function arguments, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory managements functions, command line arguments, C program examples.

Unit-4

Introduction to data structures, representing stacks and queues in C using arrays, infix to post fix conversion, postfix expression evaluation, Applications of Queue. Searching - Linear and binary search methods, sorting - Bubble sort, selection sort, Insertion sort, Quick sort.

Text Books:

1. E. Balagurusamy, “Programming in ANSI C”, 4/e, (TMH)
2. Seymour Lipschutz, “Data Structure with C”, - Schaum’s Outlines MGH.

Reference Books:

1. B. Kernighan & Dennis Ritchie, “The C Programming Language”, 2/e PHI
2. P.C. Sethi, P.K. Behera, “Programming using C”, Kalyani Publisher, Ludhiana
3. Data Structures Using C - A. S. Tanenbaum, Y. Langsam, M. J. Augenstein, PHI/Pearson.

Generic Elective Paper I Practical: C and Data Structure Lab

1. Write a Program to find the greatest among three numbers.
2. Write a Program to check a number is leap year or not.
3. Write a Program to print the sum and product of digits of an integer.
4. Write a Program to reverse a number.
5. Write a Program to compute the sum of the first n terms of the following series

$$S = 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \dots$$

6. Write a function to find whether a given no. is prime or not.
7. Write a Program to compute factorial of a number.
8. Write a Program to print a triangle of stars as follows (take number of lines from user)
9. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.
10. To insert and delete elements from appropriate position in an array.
11. To search an element and print the total time of occurrence in the array.
12. Array implementation of Stack.
13. Array implementation of Queue.
14. To perform Bubble sort.
15. To perform Selection sort.

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GE: Subject: GEOLOGY (GEOL)

GENERIC ELECTIVES (TWO PAPER CHOICE)

(copied from page 15 of Geology Model CBCS syllabus)

1st year: (Semester- I & II): Paper: GE-GEOL-A-1 & GE-GEOL-B-1

Generic Elective Paper I for Non-Geology students General Geology and Mineralogy

Unit-1: General geology and geomorphology

Scope and subdivisions of Geology; Origin, age and interior of the Earth; Earthquake and volcanoes. Weathering and erosion; Geological work of river, wind, glacier and underground water.

Unit-2: Crystallography

Crystalline and non-crystalline substances; Symmetry elements, parameters and indices; Classification of crystals into six systems. Symmetry elements and forms of normal classes of isometric, tetragonal and orthorhombic systems.

Unit - 3: Mineralogy

Minerals: definition and classification; Study of physical and chemical characters of rock forming minerals like quartz, feldspar, hypersthene, diopside, augite, hornblende, muscovite, biotite, garnet, olivine, sillimanite, kyanite, tourmaline, topaz, epidote, calcite, apatite, fluorite, talc, gypsum and corundum.

Unit - 4: Optical Mineralogy

Nature of light rays; Polarization, Double refraction, Isotropism, Anisotropism, Nicol prism, Petrological microscope; Behaviour of light in thin section; Birefringence; pleochroism, extinction angle and interference colours.

Generic Elective Paper I : Practical

Identification of crystal models with respect to axis, symmetry and forms; Megascopic and microscopic identification of minerals mentioned in theory. Laboratory record and viva voce.

Text Book: Mukherjee, P. K., Text Book of Geology, World Press

2ns year: (Semester- III & IV): Paper:GE-GEOL-A-2 & GE-GEOL-B-2

Generic Elective Paper II for Non-Geology students Petrology and Historical Geology

Unit–1:Igneous and metamorphic petrology

Forms and texture of igneous rocks; Bowen's reaction series; Classification of igneous rocks; Magmatic differentiation; Petrography of granite, syenite, zirconite, anorthosite, gabbro, dolerite and basalt. Metamorphism: definition, agents, types. Petrography of schists, gneisses, marble, charnockite and khondalite.

Unit – 2: Sedimentary Petrology

Formation of sedimentary rocks; Texture, structure and classification of sedimentary rocks. Petrography of conglomerate, breccia, sandstone, shale and limestone.

Unit - 3: Palaeontology

Fossilisation and uses of fossils; Morphology and geologic history of trilobite, brachiopod, pelecypod, gastropod, cephalopod. Gondwana flora.

Unit - 4: Stratigraphy

Definition and scope of stratigraphy. Stratigraphic units and correlation. Physiographic division of Indian subcontinent. Stratigraphy of type areas of Archaeans, Cuddapah, Vindhyan, Triassic, Jurassic, Cretaceous and Gondwanas.

Generic Elective Paper I : Practical

Megascopic and microscopic identification of igneous, sedimentary and metamorphic rocks as mentioned in theory. Morphological study of invertebrate and plant fossils mentioned in theory; drawing and labeling of fossils. Laboratory record and viva voce.

Text Book: Mukherjee, P. K. Text Book of Geology, World Press

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GE: Subject: MATHEMATICS (MATH)

GENERIC ELECTIVES (TWO PAPER CHOICE)

(copied from page 36 to 39 of Mathematics Model CBCS syllabus)

1st year: (Semester- I & II) : Paper: GE-MATH-A-1 & GE-MATH-B-1

Generic Elective Paper I CALCULUS AND DIFFERENTIAL EQUATIONS

Objective: Calculus invented by Newton and Leibnitz is powerful analytical tool to solve mathematical problems which arise in all branches of science and engineering. The main emphasis of this course is to equip the student with necessary analytic and technical skills to handle problems of a mathematical nature as well as practical problems using calculus and differential equation. The aim should be to expose the students to basic ideas quickly without much theoretical emphasis with importance on applications.

Excepted Outcomes: After completing the course, students are expected to be able to apply knowledge of calculus and differential equations in the areas of their own interest.

UNIT-I

Curvature, Asymptotes, Tracing of Curves (Catenary, Cycloid, Folium of Descartes), Rectification, Quadrature, Elementary ideas about Sphere, Cones, Cylinders and Conicoids.

UNIT-II

Review of limits, continuity and differentiability of functions of one variable and their properties, Rolle's theorem, Mean value theorems, Taylor's theorem with Lagrange's theorem and Cauchy's form of remainder, Taylor's series, Maclaurin's series of $\sin x$, $\cos x$, e^x , $\log(1+x)$, $(1+x)^m$, L' Hospital's Rule, other Intermediate forms.

UNIT-III

Limit and Continuity of functions of several variables, Partial derivatives, Partial derivatives of higher orders, Homogeneous functions, Change of variables, Mean value theorem, Taylor's theorem and Maclaurin's theorem for functions of two variables (statements & applications), Maxima and Minima of functions of two and three variables, Implicit functions, Lagrange's multipliers (Formulae & its applications), Concepts of Multiple integrals & its applications.

UNIT-IV

Ordinary Differential Equations of order one and degree one (variables separable, homogeneous, exact and linear). Equations of order one but higher degree. Second order linear equations with constant coefficients, homogeneous forms, Second order equations with variable coefficients, Variation of parameters.

BOOKS RECOMMENDED:

1. Shanti Narayan, P. K. Mittal, Differential Calculus, S. Chand, 2014.
2. Shanti Narayan, P. K. Mittal, Integral Calculus, S. Chand, 2014.
3. S.C. Mallik and S. Arora-Mathematical Analysis, New Age International Publications.
4. J. Sinharoy and S. Padhy: A Course of Ordinary and Partial Differential Equations, Kalyani Publishers.

BOOK FOR REFERENCES:

1. H. Anton, I. Bivens and S. Davis, *Calculus*, 10th Ed., John Wiley and Sons (Asia) P. Ltd., Singapore, 2002.
2. Shanti Narayan and P.K. Mittal-Analytical Solid Geometry, S. Chand & Company Pvt. Ltd., New Delhi.
3. Martin Braun-Differential Equations and their Applications-Martin Braun, Springer International.
4. B. P. Acharya and D. C. Sahu: Analytical Geometry of Quadratic Surfaces, Kalyani Publishers.

2nd Year: (Semester- III & IV) : Paper: GE-MATH-A-2 & GE-MATH-B-2

Generic Elective Paper II ALGEBRA

Objective: This is a preliminary course for the basic courses in mathematics like, abstract algebra and linear algebra. The objective is to acquaint students with the properties of natural numbers i.e. Euclidean algorithm, congruence relation, fundamental theorem of arithmetic, etc.

The basics of linear algebra i.e. vector spaces, matrices are introduced here.

Expected Outcomes: The acquired knowledge will help students to study further courses in mathematics like, group theory, ring theory and field theory and linear algebra. It has applications not only in higher mathematics but also in other science subjects like computer science, statistics, physics, chemistry etc.

UNIT-I

Sets, relations, Equivalence relations, partial ordering, well ordering, Functions, Composition of functions, Invertible functions, One to one correspondence and cardinality of a set, statements, compound statements, proofs in Mathematics, Truth tables, Algebra of propositions, logical arguments

UNIT-II

Well-ordering property of positive integers, Division algorithm, Divisibility and Euclidean algorithm, Congruence relation between integers, Principles of Mathematical Induction, statement of Fundamental Theorem of Arithmetic.

UNIT-III

Matrices, algebra of matrices, determinants, fundamental properties, minors and cofactors, product of determinant, adjoint and inverse of a matrix, Rank and nullity of a matrix, Systems of linear equations, row reduction and echelon forms, solution sets of linear systems, applications of linear systems,.

UNIT-IV

Vector spaces and subspaces, examples, linear independence, linear dependence, basis, dimension, examples, Introduction to linear transformations, matrix representation of a linear transformation, Eigen values, Eigen vectors of a matrix.

BOOKS RECOMMENDED:

1. Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory, 3rd Ed., Pearson Education (Singapore) P. Ltd., Indian Reprint, 2005.
2. V Krishna Murthy, V P Mainra, J L Arora, An Introduction to Linear Algebra , Affiliated East-West Press Pvt. Ltd

BOOKS FOR REFERENCE:

1. David C. Lay, Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007.
2. B S Vatsa and Suchi Vatsa Theory of Matrices New age International third edition 2010.
3. Ward Cheney, David Kincaid. Linear algebra theory and applications, Jones and Bartlett , 2010.

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GE: Subject: PHYSICS (PHY)

*Generic Elective Papers (GE) (Minor-Physics) for other Departments/Disciplines: (Credit: 06 each)
Depending on their requirements, Universities may choose 2 (two) GE subjects with 2 papers from each subject or only one GE subject with 4 papers from it. (Page-3)*

Two papers GE subject will be :

- 1. GE-I** (Mechanics & Properties of matter, Oscillation & Waves, Thermal Physics, Electricity and Magnetism & Electronics) + Lab
- 2. GE-II** (Optics, Special Theory of Relativity, Atomic Physics, Quantum Mechanics and Nuclear Physics)+ Lab

(copied from page 3, 29 to 32 of Physics Model CBCS syllabus)

1st year: (Semester- I & II) : Paper: GE-PHY-A-1 & GE-PHY-B-1

Generic Elective Paper I (Mechanics and Properties of matter, Oscillation and Waves, Thermal Physics, Electricity and Magnetism and Electronics)

UNIT-I: Mechanics and Properties of Matter

- Moment of Inertia Parallel axis and perpendicular axis theorem, M.I. of a Solid sphere and Solid cylinder,
- Gravitational potential and field due to a thin spherical shell and a solid sphere at external points and internal points,
- Relation among elastic constants, depression at free end of a light cantilever,
- Surface tension, pressure difference across a curved membrane,
- Viscous flow, Poiseulles formula.

UNIT-II: Oscillation and Waves

- Simple harmonic motion, damped harmonic motion, under damped, over damped and critically damped motion, Forced vibration, Resonance,
- Wave equation in a medium, Velocity of Longitudinal waves in an elastic medium and velocity of transverse wave in a stretched string,
- Composition of SHM, Lissajous figures for superposition of two orthogonal simple harmonic vibrations (a) with same frequency, (b) frequency with 2:1.

UNIT-III: Thermal Physics

- Entropy, change in entropy in reversible and irreversible process, Carnot engine and its efficiency. Carnot Theorem, Second law of thermodynamics, Kelvin-Planck, Clausius formula.

- Thermal conductivity, differential equation for heat flow in one dimension,
- Maxwell thermodynamic relation (statement only), Clausius Clapeyron equation,
- Black body radiation, Planck radiation formula (No derivation).

UNIT-IV: Electricity and Magnetism & Electronics

Electricity : Gauss law of electrostatics, use of Gauss law to compute electrostatic field due to a linear charge distribution,

Magnetism : Magnetic induction B, Lorentz force law, Biot Savarts law, Magnetic induction due to long straight current carrying conductor, and in the axis of a current carrying circular coil, Amperes Circuital law, its differential form, The law of electromagnetic equations, its differential and integral form,

- Maxwells electro-magnetic equations and their physical significance,
- Growth and decay of currents in LR and RC circuits, time constant, alternating currents in RC, RL and LCR circuits, impedance, power factor, resonance.

Electronics: P-type and N-type semiconductors, PN-Junction as rectifier, Half wave and Full wave rectifiers (Bridge type), efficiency, ripple factor, use of RC, LC, and filters, working of PNP and NPN transistors, transistor configurations in CE and CB circuits and relation between α and β . JFET, its operation and characteristics of VI curve.

Text Books:

1. Elements of Properties of Matter D.S. Mathur (S. Chand Publication)-2010
2. Heat and Thermodynamics A.B. Gupta and H.B. Ray (New Central Book Agency)-2010
3. A Text Books book of oscillations, waves and acoustics (5thed.) M. Ghosh and D. Bhattacharya (S. Chand Publication)-2018
4. Electricity and magnetism- R. Murugesan (S.Chand publishing)-2017
5. Fundamentals of Electronics-Raskhit and Chattopadhyay (New age International Publication)-2018

Reference Books:

1. Physics of Degree students Vol.I M. Das, P.K. Jena etal (Sri Krishna Prakashan)-2006
2. Physics of Degree students Vol.II M. Das, P.K. Jena etal (Sri Krishna Prakashan)-2006
3. Waves and Oscillations (2nd ed) N. Subramaniam and Brij Lal (Vikas Publications)-1994
4. A Text Books book of Sound (2nd ed) - N. Subramaniam and Brij Lal (S. Chand Publications)-1999

Generic Elective Paper I Lab- (minimum 6 experiments are to be done)

1. To determine the moment of inertia of a fly wheel.
2. To determine the Young's modulus Y of a wire by Searl's method.
3. To determine the modulus of rigidity of a wire by Maxwell's needle/Torsion Pendulum (Dynamic method).
4. To determine g by bar pendulum.
5. To determine the value of Y of a rubber by using travelling microscope.
6. To determine the Rigidity of modulus by static method.
7. To determine the frequency of a telescope by using Sonometer.

8. Verification of Laws of Vibration of a string by using Sonometer.
9. To compare capacitances using De Sauty bridge.
10. To determine the Law of resistance by using Foster bridge.
11. Compare the specific heat of two liquids by method of Cooling.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. A Laboratory Manual of Physics for Undergraduate Classes, D.P. Khandelwal (1985), Vani Publication
3. A Text Books of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition (2011), Kitab Mahal, New Delhi

2nd Year: (Semester- III & IV) : Paper: GE-PHY-A-2 & GE-PHY-B-2

Generic Elective Paper -II (Optics, Atomic Physics, Quantum Mechanics and Nuclear Physics & Special Theory of Relativity)

UNIT-I: Optics

Optics-I: Elementary ideas of monochromatic aberrations and their minimization, chromatic aberration, achromatic combination, Theory of formation of primary and secondary rainbow,

- Condition of interference, coherent sources, Young's double slit experiment, biprism and measurement of wave length of light of by it, color of thin films and Newton's rings,
- Fresnel and Fraunhofer diffraction, diffraction by single slit plane transmission grating.

Optics-II : Electromagnetic nature of light, polarized and unpolarized light, polarization by reflection and refraction, Brewster's Law, Malus Law, Double refraction, Ordinary and extraordinary rays.

UNIT-II: Atomic Physics

- Inadequacy of classical physics, brief outline of Rayleigh Jeans theory and Planck's quantum theory of radiation, particle nature of electromagnetic radiation photo electric effect, Compton effect, dual nature of radiation, wave nature of particles, de-Broglie hypothesis, matter wave, wave-particle duality, Davisson- Germer experiment.
- Bohr's theory of Hydrogen atom, explanation of Hydrogen Spectra, correction for finite mass of the nucleus, Bohr's correspondence principle, limitations of Bohr's theory, Discrete energy, exchange by atom Frank Hertz experiment.

UNIT-III: Quantum Mechanics :

Heisenberg's Uncertainty relation, Time dependent Schrodinger's wave equation in one dimension and three dimensions, The physical interpretation of the wave function, Probability density and probability current density, Equation of continuity, Normalization of the Wave function, Expectation value of an observable, Ehrenfest's theorem. Time independent Schrodinger's wave equation in one dimension particle in a box, energy eigen values and eigen functions.

UNIT-IV

Nuclear Physics : Properties of the nucleus Charge, Size, Spin, Magnetic Moment, Mass, Mass defect, Binding energy, Packing fraction, Nuclear force and its characteristics features,

- Radioactive decay laws, average life, half life, nuclear fission, nuclear fusion,
- Linear accelerators and cyclotron.

Relativity: Galilean transformation, Newtonian relativity and its limitation, Michelson Morley experiment and its consequence, postulates of special theory of relativity. Lorentz transformation, length contraction, time dilation, relativistic mass and momentum, mass energy relation.

Text Books:

1. University Physics, H. D. Young, R. A. Freedman (Person)-2017
2. Fundamentals of Physics, Resnick, Halliday, Walker (Wiley)-2015

Reference Books:

1. A Text Books book of Optics N. Subrahmanyam and Brij Lal (S.Chand Publishing)-2006
2. Introduction to Special Relativity-R. Resnick (John Wiley)-2007
3. Concepts of Modern Physics Arthur Beiser (McGraw Hill)-2017
4. Modern Physics H.S. Mani and G.K.Mehta-2018.

Generic Elective Paper II LAB
(minimum 6 experiments are to be done)

1. Determination of E.C.E. of a Copper by taking 3 readings.
2. Determination of Refractive index of the material of a prism using Sodium light.
3. To determine the wavelength of light using plane diffraction grating.
4. To determine the wavelength of light using Newton's ring.
5. Determination of refractive index of (a) glass and (b) liquid by using travelling microscope.
6. To plot the I-D curve and to determine the refractive index of a prism
7. Determination of radius of curvature of a convex/concave mirror by using Kohlrausch's method.
8. To determine the magnifying power of a given telescope.
9. To Obtain the static characteristics of a P-N-P/N-P-N transistor/Triode Valve.
10. To determine the reduction factor of a tangent Galvanometer.
11. To study the Variation of magnetic field along the axis of a circular coil carrying current.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint and H.T. Worsnop, (1971), Asia Publishing House
2. A Laboratory Manual of Physics for Undergraduate Classes, D.P.Khandelwal (1985), Vani Publication
3. A Text Books of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition (2011), Kitab Mahal, New Delhi

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GE: Subject: ZOOLOGY (ZOO)

[Universities where 2 subjects of two papers each are offered can offer GE1 and GE2.] (page-4)
(copied from page 4, 30 to 34 of Zoology Model CBCS syllabus)

1st year: (Semester- I & II) : Paper: GE-ZOO-A-1 & GE-ZOO-B-1

Generic Elective Paper I
Animal Diversity

Unit 1: Protista, Porifera, Radiata, Aceolomates and Pseudocoelomates

General characters of Protozoa; Life cycle of *Plasmodium*, General characters and canal system in Porifera, General characters of Cnidarians and polymorphism, General characters of Helminthes; Life cycle of *Taenia solium*, General characters of Nemethehelminthes; Parasitic adaptations

Unit 2: Coelomate Protostomes, Arthropoda, Mollusca and Coelomate Deuterostomes

General characters of Annelida, Metamerism, General characters, Social life in insects, General characters of mollusca, torsion in gastropod, pearl formation, General characters of Echinodermata, larval form in Echinodermata.

Unit 3: Protochordata , Pisces, Amphibia

Salient features, Osmoregulation, Migration of Fishes, General characters, Adaptations for terrestrial life, Parental care in Amphibia.

Unit 4: Reptiles, Aves and Mammals

Amniotes, Origin of reptiles, Terrestrial adaptations in reptiles, Origin of birds; Flight adaptations, early evolution of mammals; Primates; Dentition in mammals.

PRACTICAL

1. Study of following specimens:

Non Chordates: *Euglena*, *Noctiluca*, *Paramecium*, *Sycon*, *Physalia*, *Tubipora*, *Metridium*, *Taenia*, *Ascaris*, *Nereis*, *Aphrodite*, *Leech*, *Peripatus*, *T. gigas*, *Limulus*, *Hermitcrab*, *Daphnia*, *Millipede*, *Centipede*, *Beetle*, *Chiton*, *Dentalium*, *Octopus*, *Asterias* and *Antedon*.

Chordates: *Balanoglossus*, *Amphioxus*, *Petromyzon*, *Pristis*, *Hippocampus*, *Labeo*, *Ichthyophis/Uraeotyphlus*, *Salamander*, *Rhacophorus*, *Draco*, *Uromastix*, *Naja*, *Viper*, model of *Archaeopteryx*, any three common birds-(Crow, duck, Owl), Squirrel and Bat.

2. Study of following Permanent Slides:

Cross section of *Sycon*, Sea anemone and *Ascaris* (male and female). T. S. of Earthworm passing through pharynx, gizzard, and typhlosolar intestine. Bipinnaria and Pluteus larva

3. Temporary mounts of Septal & pharyngeal nephridia of earthworm.

Unstained mounts of Placoid, cycloid and ctenoid scales.

TEXT BOOKS

1. Kotpal RL. (2016) Modern Textbook of Zoology –Vertebrates; Rastogi Publications – Meerut.
2. Kotpal RL.(2016) Modern Textbook of Zoology –Invertebrates; Rastogi Publications – Meerut.

SUGGESTED READINGS

1. Barnes, R.D. (1992). Invertebrate Zoology. Saunders College Pub. USA.
2. Campbell & Reece (2005). Biology, Pearson Education, (Singapore) Pvt. Ltd.
3. Raven, P.H. and Johnson, G. B. (2004). Biology, 6th edition, Tata McGraw Hill Publications, New Delhi.

4. Kardong, K.V. (2002). Vertebrates Comparative Anatomy. Function and Evolution. Tata McGraw Hill Publishing Company. New Delhi.

OR

Insect Vectors and Diseases

Unit 1: Insects, Concept of Vectors, Insects as Vectors

General Features of Insects, Morphological features, Head – Eyes, Types of antennae, Mouth parts with reference to. feeding habits, Brief introduction of Carrier and Vectors (mechanical and biological vector), Reservoirs, Host-vector relationship, Vectorial capacity, Adaptations as vectors, Host Specificity, Classification of insects up to orders, detailed features of orders with insects as vectors – Diptera, Siphonaptera, Siphunculata, Hemiptera

Unit 2: Dipteran as Disease Vectors

Dipterans as important insect vectors – Mosquitoes, Sand fly, Houseflies; Study of mosquito-borne diseases – Malaria, Dengue, Chikungunya, Viral encephalitis, Filariasis; Control of mosquitoes Study of sand fly-borne diseases – Visceral Leishmaniasis, Cutaneous Leishmaniasis, Phlebotomus fever; Control of Sand fly, Study of house fly as important mechanical vector, Myiasis, Control of house fly

Unit 3: Siphonaptera and Siphunculata as Disease Vectors

Fleas as important insect vectors; Host-specificity, Study of Flea-borne diseases – Plague, Typhus fever; Control of fleas, Human louse (Head, Body and Pubic louse) as important insect vectors; Study of louse-borne diseases – Typhus fever, Relapsing fever, Trench fever, Vagabond's disease, Phthiriasis; Control of human louse

Unit 4: Hemiptera as Disease Vectors

Bugs as insect vectors; Blood-sucking bugs; Chagas disease, Bed bugs as mechanical vectors, Control and prevention measures

PRACTICAL

1. Study of different kinds of mouth parts of insects
2. Study of following insect vectors through permanent slides/ photographs: *Aedes*, *Culex*, *Anopheles*, *Pediculus humanus corporis*, *Phthirus pubis*, *Xenopsylla cheopis*, *Cimex lectularius*, *Phlebotomus argentipes*, *Musca domestica* through permanent slides/ photographs
3. Study of different diseases transmitted by above insect vectors.
4. Submission of a project report on any one of the insect vectors and disease transmitted.

TEXT BOOKS

1. Mathews, G. (2011). Integrated Vector Management: Controlling Vectors of Malaria and Other Insect Vector Borne Diseases. Wiley-Blackwell
2. Chapman, R.F. (1998). The Insects: Structure and Function. IV Edition, Cambridge University Press, UK

SUGGESTED READINGS

1. Mike Service (2012) Medical Entomology for Students Cambridge University Press; 5th edition.
2. Pedigo L.P. (2002). Entomology and Pest Management. Prentice Hall Publication

2nd Year: (Semester- III & IV) : Paper: GE-ZOO-A-2 & GE-ZOO-B-2

Generic Elective Paper II Aquatic Biology

UNIT 1: Aquatic Biomes

Brief introduction of the aquatic biomes: Freshwater ecosystem (lakes, wetlands, Streams and rivers), estuaries, intertidal zones, oceanic pelagic zone, marine benthic zone and coral reefs

UNIT 2: Freshwater Biology

Lakes: Origin and classification, Lake as an Ecosystem, Lake morphometry, Physico-chemical Characteristics: Light, Temperature, Thermal stratification, Dissolved Solids, Carbonate, Bicarbonates, Phosphates and Nitrates, Turbidity; dissolved gases (Oxygen, Carbon dioxide). Nutrient Cycles in Lakes-Nitrogen, Sulphur and Phosphorous

Streams: Different stages of stream development, Physico-chemical, environment, Adaptation of hill-stream fishes.

UNIT 3: Marine Biology

Salinity and density of Sea water, Continental shelf, Adaptations of deep sea organisms, Coral reefs, Sea weeds.

UNIT 4: Management of Aquatic Resources

Causes of pollution: Agricultural, Industrial, Sewage, Thermal and Oil spills, Eutrophication, Management and conservation (legislations), Sewage treatment Water quality assessment- BOD and COD. 015

PRACTICAL:

1. Determine the area of a lake using graphimetric and gravimetric method.
2. Identify the important macrophytes, phytoplanktons and zooplanktons present in a lake ecosystem.
3. Determine the amount of Turbidity/transparency, Dissolved Oxygen, Free, Carbon dioxide, Alkalinity (carbonates & bicarbonates) in water collected from nearby lake/ water body.
4. Instruments used in limnology (Secchi disc, Van Dorn Bottle, Conductivity meter, Turbidity meter, PONAR grab sampler) and their significance.
5. A Project Report on a visit to a Sewage treatment plant/Marine bioreserve/ Fisheries Institutes.

TEXT BOOKS

1. Wetzel RG (2001) Limnology: Lake and River Ecosystems, Academic Press; 3rd edition

SUGGESTED READINGS

1. Anathakrishnan : Bioresources Ecology 3rd Edition
2. Odum and Barrett : Fundamentals of Ecology, 5th Edition
3. Pawlowski: Physicochemical Methods for Water and Wastewater Treatment, 1st Edition
4. Trivedi and Goyal : Chemical and biological methods for water pollution studies
5. Welch : Limnology Vols. I-II

OR

Food, Nutrition And Health

Unit 1: Basic concept of food and nutrition

Food Components and food-nutrients, Concept of a balanced diet, nutrient needs and dietary pattern for various groups, adults, pregnant and nursing mothers, infants, school children, adolescents and elderly

Unit 2: Nutritional Biochemistry:

Carbohydrates, Lipids, Proteins- Definition, Classification, their dietary source and role Vitamins- Fat-soluble and Water-soluble vitamins- their dietary source and importance Minerals- Iron, calcium, phosphorus, iodine, selenium and zinc: their biological functions

Unit 3: Health

Introduction to health- Definition and concept of health, Major nutritional Deficiency diseases- Protein Energy Malnutrition (kwashiorkor and marasmus), Vitamin A deficiency disorders, Iron deficiency disorders, Iodine deficiency disorders- their causes, symptoms, treatment, prevention and government programmes, if any. Life style related diseases- hypertension, diabetes mellitus, and obesity- their causes and prevention through dietary and lifestyle modifications, Social health problems- smoking, alcoholism, drug dependence and Acquired Immuno Deficiency Syndrome (AIDS) - their causes, treatment and prevention, Common ailments- cold, cough, and fevers, their causes and treatment

Unit 4: Food hygiene:

Potable water- sources and methods of purification at domestic level Food and Water borne infections: **Bacterial infection:** Cholera, typhoid fever, dysentery; **Viral infection:** Hepatitis, Poliomyelitis, **Protozoan infection:** amoebiasis, giardiasis; **Parasitic infection:** taeniasis and ascariasis their transmission, causative agent, sources of infection, symptoms and prevention. Brief account of food spoilage: Causes of food spoilage and their preventive measures

01

PRACTICAL

1. To detect adulteration in a) Ghee b) Sugars c) Tea leaves and d) Turmeric
3. Estimation of Lactose in milk
4. Ascorbic acid estimation in food by titrimetry
5. Estimation of Calcium in foods by titrimetry
6. Study of the stored grain pests from slides/ photograph (*Sitophilus oryzae*, *Trogoderma granarium*, *Callosobruchus chinensis* and *Tribolium castaneum*): their identification, habitat and food sources, damage caused and control. Preparation of temporary mounts of the above stored grain pests.
7. Project- Undertake computer aided diet analysis and nutrition counseling for different age groups. OR Identify nutrient rich sources of foods (**fruits and vegetables**), their seasonal availability and price OR Study of nutrition labeling on selected foods

TEXT BOOKS

1. Mudambi, SR and Rajagopal, MV (2018). Fundamentals of Foods, Nutrition and Diet Therapy; Sixth Ed; New Age International Publishers.
2. Bamji MS, Rao NP, and Reddy V.(2017) Text Book of Human Nutrition; Oxford & IBH Publishing Co. Pvt Ltd., 4th edition

SUGGESTED READINGS

1. Srilakshmi B. Nutrition Science; 2002; New Age International (P) Ltd.
2. Srilakshmi B. Food Science; Fourth Ed; 2007; New Age International (P) Ltd.
3. Swaminathan M. Handbook of Foods and Nutrition; Fifth Ed; 1986; BAPPCO

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GE: COMMERCE
GE Subject: Commerce (COM)
(Page 38 to 43 of Commerce Model CBCS syllabus)

Generic Elective for commerce students– 4 papers as adopted.

NOU, Baripada opted for GE-1, GE-2, GE-3 & GE-4 papers for commerce honours)

1st year: (Semester- I) : Paper: GE-1 : Micro Economics GE-1

1st year: (Semester- II) : Paper: GE-2: Macro & Indian Economy GE-2

2nd Year: (Semester- III) : Paper: GE-3 : Business Statistics GE-3

2nd Year: (Semester-IV) : Paper: GE-4 : Principles of Marketing GE-4

For detailed syllabus of each paper download from the link

<http://gwckeonjhar.in/syllabus.aspx>

or

<http://dheodisha.gov.in/DocPath.ashx?clsid=9&id=CommerceHonsPassrevised.pdf>

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AECC- Ethics & Values (EV)

Guideline for the Newly Introduced “Ethics and Values” Compulsory Course

The new course “Ethics and Values” has been designed to be taught among the +3 under graduate degree course from the session 2021-2022 under AECC (i.e. Ability Enhancement Compulsory Course) which is as follows:

- | | |
|---|--|
| • Course Name | Ethics and Values |
| • Total No. of Units - | 6 Units (One unit per Semester) |
| • No. of credit to be awarded- | 1 credit per semester (total 6 credits) |
| • No. of lectures per unit per semester- | 15 classes of 45 minutes duration |
| • Marks - | 25 marks per unit per semester
Grand total 150 marks for six semesters |
| • Total No. of subunits per unit- | 4 subunits |
| • Course material available on- | e-Books will be available on OSHEC website
and e-Lectures on www.vtputkal.odisha.gov.in |
| • Teaching assignment - | Classes can be assigned to teachers of any subject
by the Principal. |
| • Question Paper Setter & Evaluator of Answer paper | - Board of Studies (BOS) of State Public University
and Autonomous colleges (Govt. /Govt. aided)
Odisha will prepare the panel of question Paper
Setter and Evaluator of Answer paper. Question
setter may be instructed to prepare question papers
as per CBCS model regulation 2018-19. Further,
question setter will have to mandatorily supply the
Scheme of Valuation along with question paper for
evaluation. |

Implementation:

All State Public Universities of Odisha (i.e. coming under HED) will implement the course “Ethics and Values” under AECC from the session 2021-2022.

Ability Enhancement Courses in CBCS in Odisha:**Ability Enhancement Compulsory Courses (AECC)**

1. Environmental Studies and Disaster Management- 4 credits
2. English/Hindi/MIL communication - 4 credits
3. Ethics and Values (EV) - 6 credits (1 credit per Unit/Semester)

B.A. / B. Com. / B. Sc. (Honors and Pass) Course

Course	Credit
Semester I	
AECC-I	04
AECC-(EV-I)	01
Semester II	
AECC-II	04
AECC-(EV-II)	01
Semester III	
AECC-(EV-III)	01
Semester IV	
AECC-(EV-IV)	01
Semester V	
AECC-(EV-V)	01
Semester VI	
AECC-(EV-VI)	01

Examination Question Pattern

- Duration of examination of each semester -1 hour
- There will be no mid-term examination (for 'Ethics and Value' Course)
- The question paper will be in bilingual format
- The question paper shall be divided into 3 parts

Part-I will carry 5 numbers of questions each carrying one mark [5 X 1]

Part-II will carry 5 numbers of questions each carrying two marks (within 50 words) [5 X 2]

Part-III will carry 2 numbers of questions each carrying five marks [2 X 5]
(Within 250 words)

The SGPA and CGPA will be calculated accordingly for awarding grades to the students.

SEMESTER-I

Unit-1

Title: - Issues Relating to Women

Total no. of Periods-15

Full mark-25

Credit point -1

1.0 Aims of the Unit:

- *The module aims to generate a sensitivity among the students towards women*
- *Enable them to value the contributions of women, from family to the larger society*
- *To generate among them a distinct urge to respect women*
- *To appreciate that women should have equal status and equal entitlements as member of the society*

Learning Objectives:

After going through the contents of the module and the classroom transactions on the contents, the students are expected to

- Have changes in their perceptions and practices towards women
- Develop proper attitude towards women and value their work and contribution
- Come forward to challenge unethical treatments against women
- End gender based hierarchy and hegemony, remove the feeling that women are counter to men and bring about a complementarity among the hitherto existing gender binary
- Allow women to realize their self worth and contribute their best for betterment of the society
- Pioneer in creating a gender equal society where the well being, happiness and security of the women will be well protected ; contributing towards a better and happier society

Teaching Hours

1.1 Introduction:

General introduction on Ethics and Values, Gender equality as an essential precursor to social progress, the present scenario, Desirable gender related values.

1-2-3

1.2 Women and Family

Pre-natal sex selection, Gendered practices in the family, Gender based division of labour in the family, Marriage and women, Marriage and women's consent, Child marriage, Practice of dowry, Women and family violence.

4-5-6-7

1.3 Women and Work

Women's work: The Invisible hands, Exploitation of women at work, Gender Stereotyping at work, Glass ceiling, Women and pay gap, Sexual Harassment of women at work, Working women and role conflict.

8-9-10-11

1.4 Women, Community and Society

Violence against women in public spaces, Gender sensitive language and communication, Gendered language, Sexist Language, Gender neutral language, Women and property Rights, Women's property Rights in Indian Laws, The functionality of Women's Property Rights

12-13-14-15

SEMESTER-II

Unit-2

Title: - Values and Good Citizenship

Total no. of Periods-15

Full mark-25

Credit point -1

2.0 Aim of the Unit:

- Introducing the Salient features of Indian Constitution to students and to inculcate the sense of patriotism in them
- Encouraging them to Volunteer for social work
- Instilling appropriate work ethics in them

Learning Objectives:

- Understanding Basic Values of Indian Constitution
- Inculcating Volunteerism for Social change
- Helping students to become good human being and citizen

Teaching Hours

2.1 Indian Constitution

Salient Values of Preamble: Sovereign, Socialist, Secular, Democratic, Republic, Justice, Liberty, Equality and Fraternity.

1-2-3

2.2 Patriotism

Patriotic Value and ingredients of nation building, Concept of Good citizenship, Emotional connection with the country, Duties of citizens and Qualities of good citizens

4-5-6-7

2.3 Volunteerism

Concept and facets of Volunteerism and Leadership, Building a better society through Volunteerism, Blood Donation, Social Work, Helping the Aged, Environmental Protection

8-9-10-11

2.4 Work Ethics

Punctuality, Cleanliness, Law abidingness, Rational Thinking and Scientific Temper

12-13-14-15

SEMESTER-III

Unit-3

Title: - Issues of Drug, Tobacco and Alcohol Addiction

Total no. of Periods-15

Full mark-25

Credit point -1

3.0 Aims of the Unit:

- Creating awareness about health and Societal hazards of drugs, tobacco and alcohol addiction
- Sensitizing students about professional support system for treatment and rehabilitation

Learning Objectives:

- The students become aware of the grave danger of consuming alcohol, tobacco and drugs
- Students would encourage their friends to remain away from tobacco ,alcohol , drugs and seek professional help when needed

Teaching Hours

3.1 Extent of the Problem

Extent of Drug and Tobacco addiction and alcoholism in India, Myths associated with them, Health hazards associated with them and how they have become silent killers

1-2-3-4

3.2 Socio- economic impact

Socio- economic impact of Drug and Tobacco addiction and alcoholism:

Loss of physical and mental strength, Loss of character, Loss of family ties and relationship, Loss of earning and livelihood potentials, Loss of societal respect and dignity etc

5-6-7-8

3.3 Laws to Address this Problem

Silent features of social legislation such as NDPS Act, 1985 and COTPA Act , 2003 , Mechanism and Government Schemes for prevention , de-addiction and rehabilitation

9-10-11-12

3.4 Role of Stake - holders

Provision of Tobacco free campus and role of students, Role of students in their family and immediate surroundings, Role of NGOs and other agencies

13-14-15

SEMESTER-IV

Unit-4

Title: - Ethical Values for Student Life

Total no. of Periods-15

Full mark-25

Credit point -1

4.0 Aims of the Unit:

- To familiarize the students with core values of Academics and Goals of Education
- To create an awareness about Unethical practices in the academics

Learning Objectives:

- The students will learn to behave ethically in the campus
- Exhibit respectful treatment to others in an organizational context
- Contribute to develop a positive social environment through active participation and cooperation with others

Teaching Hours

4.1 Meaning and Objective of Education:

Knowledge is power and quest for knowledge is the real meaning of education, not quest for Degree and qualifications; Real education builds character: Difference between Academic Qualification and Ability, Academic failure could be failure within the classroom, but not outside (i.e. Failed in exam, passed in life!)

4.2 Challenges for Ethical Practices in Institutions of Higher Education:

Ragging, Suicide and Need for Educational Counseling, Violence vs. Peaceful Protest, Conflict resolution, Plagiarism and Violation of Intellectual property Rights, Cheating in Examination and other Fraudulent Practices

4.3 Inter personal Relation and Community Life in HEI:

Green Preacher and conservation of Energy, Community Life in Campus including Hostels, Local Common area, Inter personal relations (Students-Teacher, Students-Student and Man-Woman, Positive Friendship).

4.4 Ethical Leadership in Academic Institution:

Concept and Traits of Leadership to provide solution, everyone has Leadership Role (not limited to position), Concept of Ethical leadership, Scope of Leadership in college and Universities for Students, Teachers and Administrators, Importance of co-curricular and extra – curricular activities.

1-2-3

4-5-6-7

8-9-10-11

12-13-14-15

SEMESTER-V

Unit-5

Title: -Vulnerable Sections of Society: Understanding their Issues

Total no. of Periods-15

Full mark-25

Credit point -1

5.0 Aims of the Unit:

To create an awareness amongst students about the need for ensuring dignity and equality for the vulnerable sections of the society.

Learning Objectives:

- Students would be able to appreciate values and ethics relating to vulnerable sections of the society.
- Students would learn to practice equality, diversity and social justice.
- Students would become more empathetic and compassionate towards vulnerable sections of the society.

Teaching Hours

5.1 Issues Relating to Children:

Nutrition and health, Child Exploitation: Child labour, trafficking, Sexual exploitation

1-2-3-4

5.2 Issues Relating to Elderly Persons:

Abuse of Elders, Financial Insecurity, Loneliness and Social Insecurity, Health Care Issues, Needs for a Happy and Dignified Ageing

5-6-7-8

5.3 Issues Relating to Persons with disability:

Rights of PWD, affirmative action, Prevention of discrimination, providing equal opportunity, various scheme for empowering PWD and social justice for PWD

9-10-11-12

5.4 Issues Relating to Third Gender:

Understanding the Third Gender, Social justice for them, Removal of discrimination, Affirmative action and Acceptance of diversity of gender.

13-14-15

SEMESTER-VI

Unit-6

Title: - Environmental & Techno Ethics

Total no. of Periods-15

Full mark-25

Credit point -1

Aims of the Unit:

- To develop awareness and sensitize students about the importance of environment for a sustainable earth and to bring Green Technology into action
- To focus their attention towards cleanliness, preservation of biodiversity and practice of conservation of natural resources
- To make them understand the judicious use of modern technology strictly on need basis
- To use science and technology for preservation of environment and its sustainable development but not for destruction.

Learning Objectives:

- Develop an understanding of environmental ethics and work towards sustainable development
- Commitment to Green Technology for sustainable future
- Understand ethical issues relating to use of digital medium

Teaching Hours

6.1 Environmental Ethics:

Types of Ecological Values, Environmental Values & Valuing Nature, Equitable use of Resources, Role of Individual in the conservation of resources for future generation, Bio-Ethics-Genetic manipulation in plants and animals for benefit of society and cruelty against animal.

1-2-3

6.2 Promotion of Green Technology:

Goal of Green Technology: Reduce recycling, **Renew** (removal of chemicals), **Refuse** and **Responsibility**.

Green Technology in relation to: -Energy and Construction.

4-5-6-7

6.3 Ethics and Technology with reference to Science, gadget, machine etc. and interaction with each other;

Agricultural, Industrial, Digital, Globalized Age etc

8-9-10-11

6.4 Judicious Use of Technology:

Judicious use of Mobile Phones, Electrical machines, Plastics, Television, Computers and their harmful effects

Ethics and Use of Digital Technology: Cyber ethics- Crimes and Ethical hacking,

Ethics of social media: WhatsApp, Facebook, Twitter and others.

12-13-14-15

CRITERIA TO PASS A PAPER:

(Copied from page no 16 of clause 13 OSHEC Model Regulation for UG Programme for

13. MINIMUMPERCENTAGE AND MARKS TO BE SECURED FOR PASSING:

13.1 Paper without Practical:

Mid Semester	End Semester	Pass Mark – End Semester	Total	Paper Pass Mark
20 (No Fail mark, but must appear mid Sem)	80	30% out of 80 (i.e. 24 marks)	100	40 out of 100 By taking both components (i.e. Mid-Sem + End Sem Exam.)

- End Semester(University Examinations) Total Mark: 80, 30% out of 80 (i.e. 24 mark)
- Total Mark: 100 (40% out of 100)
- No Pass mark for Mid Semester Exam. A student has to appear the Mid Semester Exam. Securing 'ABS' in both the chances in Mid Semester examinations, the student will be declared fail in that paper, though he/she secures pass mark in theory papers.

13.2 Paper with Practical :

Mid Semester (No Fail mark, but must appear mid Sem)	End Semester					Paper Pass Mark
	A. Theory	Pass Mark A-Theory	B. Practical	Pass Mark B. Practical	Total	
15	60	30% out of 60 (i.e. 18 mark)	25	40% out of 25 (i.e. 10 mark)	100	40 out of 100 By taking (i.e. Mid-Sem + End Sem Exam + Practical)

- End Semester(University Examinations) : Total Mark: 60, 30% out of Total Mark(i.e. 18 mark)
- Minimum pass mark for practical paper is 40%.
- Total Mark: 100 (40% out of 100)
- No Pass mark for Mid Semester Exam. A student has to appear the Mid Semester Exam. Securing 'ABS' in both the chances in Mid Semester examination, student will be declared fail in that paper, though he/she secures pass mark in theory and practical paper.

NB: In order to clear a Semester examination a candidate is required to pass in all theory & practical papers/project component of the said semester.

EXAMINATION QUESTION PATTERN

(Copied from page no 16 of clause 12 OSHEC Model Regulation for UG Programme for +3 CBCS System w.e.f. 2019-20)

12.1. The **duration of end semester** examination is as reflected in *Clause No.5* given below.

5. DURATION OF THE EXAMINATIONS - MID SEMESTER & END SEMESTER:

The Choice Based Credit System (CBCS) examination shall be implemented in Semester pattern. Examination timetable for the odd semester will be communicated by 20th June and even semester by 7th December. Each semester examination shall consist of a **Mid-Semester (Internal) Examination** and **End Semester examination**. Mid Semester examination shall be conducted only for theory papers. End Semester Examination in theory papers carrying full marks **above 50** (e.g. 60, 75, 80 etc) shall be of 3 hours duration and practical shall be of **3 hours (for full marks carrying 25)**. On the other hand, theory papers carrying **50 marks or below** shall be of 2 hours duration.

12.2 For subjects other than language subjects and without having practical, full marks are 100 per paper out of which **20 marks** are allotted for Mid-Semester Examination (Internal) and **80 marks** are for end semester examination.

- a. The question papers shall be divided into **four parts**.
- b. **Part I** will carry 12 one mark questions in the form of fill in the blanks and one word answer. (12 marks)
- c. **Part II** will carry 10 two mark questions of which 8 have to be answered. The answer should be within two to three sentences maximum. (16 marks (8X2))
- d. **Part III** will carry 10 three mark questions of which 8 have to be answered. The answer should be within 75 words maximum. (24 marks (8X3))
- e. **Part IV** will carry 4 seven mark questions of EITHER OR format. The EITHER OR in question can be from same or different units of the paper. The answer should be within 500 words maximum. (28 marks (7X4))

12.3 For subjects other than language subjects and with practical, full marks are 100 per paper out of which **15 marks** is allotted for Mid-Semester Examination, **60 marks** is for End Semester Examination and **25 marks is for practical**.

- a. The question papers shall be divided into **four parts**
- b. **Part I** will carry 8 one mark questions in the form of fill in the blanks and one word answer. (08 marks (8X1))
- c. **Part II** will carry 10 one point five mark questions of which 8 have to be answered. The answer should be within two to three sentences maximum. (12 marks (8X1.5))
- d. **Part III** will carry 10 two mark questions of which 8 have to be answered. The answer should be within 75 words maximum. (16 marks (8X2))
- e. **Part IV** will 4 numbers of six mark questions of EITHER OR format. The EITHER OR in question can be from same or different units of the paper. The answer should be within 500 words maximum. (24 marks (6X4))

f Practical will carry 25 marks out of which 05 will be for records , 05 for viva voce and 15 for the core experiment .

12.4 For Language courses like Odia, Hindi, Sanskrit, English, the question pattern and marking scheme will be **as given in the respective curriculum**. For Example, MIL (Odia) is available in the Model Syllabus for Odia.

12.5 For Autonomous Colleges, each department shall have a designated Teacher in-charge of Examination to be decided by the Principal in addition to the Controller of Examinations of the College.

For non autonomous college, the principal or the teacher **nominated by the principal** will be responsible for conducting examinations.

Suitable modifications may be made by the Autonomous Colleges keeping in view the UGC Guideline for Autonomous Colleges, University as well as state government's Guidelines from time to time.

12.7 The board of studies in each subject are required **to prepare Question Banks** in each paper and submit it to the controller of Examination.

DSE-4(Project): The guidelines and sample report prescribed by MSCBU, Baripada is given below.



OFFICE OF THE CONTROLLER OF EXAMINATIONS

MAHARAJA SRIRAM CHANDRA BHANJA DEO UNIVERSITY

SRIRAM CHANDRA VIHAR, TAKATPUR, BARIPADA, MAYURBHANJ, ODISHA, 757003

No. 1096 (MSCBU/EC/UG-35/2023)

Date: - 15.04.23

OFFICE ORDER

It is for the information of all concerned that the following guidelines for project work/ Dissertation of Discipline Specific Elective (DSE) – 4 for 6th semester UG Examination 2023 and onwards as follows.

1. Maximum 8 no. of students are allowed to collaboratively and co-operatively work in a project/dissertation with a single common title if the number of students is more than 8. However Supervisor/Guide are required to allot different topic/title to the students if student representation is less than 8 nos.
2. An individual student is required to prepare at least 3 copies of projects reports for fulfilling the requirements given below.
 - A. A Copy for evaluation by an External examiner appointed by the University and Internal examiner jointly.
 - B. A copy for the department for future reference.
 - C. A student Copy.
3. The number of pages of the project report/dissertation shall be of minimum 20 pages with one side printing of the pages. The inner text of the report may be designed using Ms-Word as follows.
 - A. Font - Times New Roman.
 - B. Font Size – 12
 - C. Lines Spacing – 1.0
 - D. The Odia/Hindi/Santali Hons Students have to prepare their project work/dissertation in their respective language preferably using a software or by own hand writing as per previous instruction. Sanskrit Hons Students have to write their project work/dissertation with Odia Scripts using Sanskrit Language.
4. The general structure of the report may be –
 - A. The preliminary section – This includes the Title/Topic page as Front Page, The Declaration, The Certificate, The Acknowledgement, The Abstract/Synopsis, The Contents, The List of Tables and Figures (If any) in the subsequent pages.
 - B. The Main Body – This includes the Introduction of the Topic, The Definitions involved in the topic, The Description of a Survey or Related Literature, The Details of the Topic, The Findings and Conclusion with suggestions for the scope of Future Work.
 - C. The Reference Section – This Includes Foot- notes, Bibliography, Appendix/Index (If any).
5. An External Examiner Appointed by the University will examine the Project Work/ Dissertation jointly with the Project Supervisor who is treated as an Internal Examiner. The Evaluated Report must be kept with the Principal office for one year for future reference and as required by the University for RTI and any legal matters.
6. The principals are required to send soft copies of Mark foils by posting the marks in a folder provided by the undersigned and keep a hard copy of the same with duly signed by External and Internal examiner as per the date line given by University.
7. The expenses of the project evaluation will be borne by the Principal/ Centre superintendent of the college out of the project fee charges. The rate of remuneration is Rs.15/- per student for both external and internal subject to a minimum of Rs200/-.The grouping structure is 16 or a part thereof will constitute one group.

Above guidelines must be strictly adhered to for Project Work/ Dissertation of DSC- 4 paper of 6th Semester UG Examinations.

Memo No 1097/MSCBU

Copy Forwarded to the Principals of all Affiliated Colleges Under MSCB University for information. They are requested to communicate the guidelines to the students as well as teachers of their respective colleges.

Controller of Examinations
MSCB University
Date – 15.04.23

Controller of Examinations
MSCB University

FRONT PAGE

TITLE OF PROJECT/DISSERTATION

*A Project Report submitted in Partial fulfillment
of the Degree of*

**Bachelor of Arts/Science/Commerce
in
Physics (Hons)**

**6th Semester UG Examination 2024
Maharaja Sriram Chandra Bhanjadeo University
Takatpur, Baripada-757003**

By

Name of Student

Roll No:- _____

Regd. No.- _____

**Under the Supervision of
Supervisor name
Designation**



(Logo of College)

Department Name

**Govt. Women's College, Keonjhar
Mandua, Keonjhar-758001
April 2024**

DECLARATION

I, ***Prajnaparamita Pradhan*** bearing Roll no –***5705K16011***, Regd. No- ***05638/16*** do here by declare that the project work entitled “***Joule Thomson Effect in Liquefaction of Gases***”, being submitted to Government Women’s College, Keonjhar affiliated to North Orissa University Mayurbhanj, Odisha for the award of Bachelor of Science, is an original piece of work done by me and the same has not been submitted elsewhere for any other academic degree diploma to this college or any other college/University.

Signature of the student

CERTIFICATE

This is to certify that the project report entitled “***Joule Thomson Effect in Liquefaction of Gases***” Performance & Application” Submitted by ***Prajnaparamita Pradhan*** for the award of the Degree of Bachelor of Science from Government Women’s College, Keonjhar, North Orissa University, Mayurbhanj, Odisha, India is a bonafide record of work carried out by her under my Supervision. Neither this project report nor any part of it has been submitted for any degree or academic award elsewhere.

Signature of Supervisor

Total Mark : 100

		External	Internal	Average mark obtained
1	Project Preparation			
2	Presentation			
3	Viva-Voice		Total=	
	(In word)			
<div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div style="width: 45%;"> <p>Signature of the External</p> </div> <div style="width: 45%;"> <p>Signature of the Internal</p> </div> </div>				

ACKNOWLEDGEMENT

I express my sincere gratitude to my supervisor and Head of the Department Mr Jyotiranjana Jena for his constant guidance during the preparation of this project work and his effort to bring out my creative capabilities.

I am thankful to our faculty members Smt Sumita Hansdah, Ms Rachismita Jena and Ms Sashwata Sahoo for their constant encouragement, for their impeccable theory sessions and affectionate support during this project work.

I would like to acknowledge the assistance provided to me by the college laboratory and library. I am indebted to my classmates for the cheerful and interactive times that I have spent with them. I wish to express my appreciation to all, who inspired and helped me directly and indirectly during my project work.

At last but not the least, I owe a lot to my parents for their encouragement, moral support and endeavor that enabled me to reach this stage of my life. They are the spirit and source of confidence for me.

Prajnaparamita Pradhan

Abstract

James Joule and William Thomson – worked in collaboration, conducting experiments found that a temperature change can occur in a gas as a result of a sudden pressure change over a valve. Known as the *Joule-Thomson effect*, this phenomenon has proven to be important in the advancement of refrigeration systems as well as liquefiers, air conditioners, and heat pumps.

In this present context the theoretical basics of Joule Thomson effect is analyzed. Further the application of Joule Thomson effect to liquefaction of some gases is discussed.

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SUBJECT AND MARK DISTRIBUTION OF CCH, DSE & GE SEMESTER WISE



OFFICE OF THE CONTROLLER OF EXAMINATIONS
MAHARAJA SRIRAM CHANDRA BHANJA DEO UNIVERSITY
SRIRAM CHANDRA VIHAR, TAKATPUR, BARIPADA, MAYURBHANJ, ODISHA, 757003

NO. MSCBDU/EC/UG/ 3242

Date: 17/12/2021

To

The Principals of All Affiliated Degree Colleges
Under MSCB University, Takatpur, Baripada.

Sub: Subject & Mark distribution for all semester UG examinations for the students of admission batch-2019-20 as per the recommendation given in State model regulation.

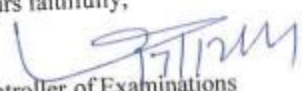
Sir/Madam,

I am directed to inform you that the semester wise and paper wise subject name and mark distribution prepared as per the recommendation given in the Model regulations for CBCS pattern is supplied herewith for your information. You are requested to circulate the same to your teaching staff and students for reference. You are requested to intimate the undersigned within seven days if you find any discrepancy in the above information through a return mail.

Though SEC-III in 5th Semester and SEC-IV in 6th Semester are there in the course structure for Science and Arts (Pass) students for the students of admission batch 2019-20 the detailed syllabus does not contain any information about the said papers in any subjects. In this context I am directed to inform you that the corresponding syllabus and subjects are decided to be implemented from the syllabi of the courses implemented as per 2016-17 model regulation.

The Honours students of admission batch 2019-20 (Arts/Science/Commerce) are allowed to prepare a Dissertation under a Project for DSE-IV paper in 6th Semester. No theory examination will be conducted for this paper.

Yours faithfully,


Controller of Examinations
MSCB University

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