

UNIVERSITY OF RAJASTHAN  
JAIPUR

SYLLABUS

Ability Enhancement Course

Foundations of English Language: A Comprehensive Introduction

I & II Semester

Examination 2023-24

As per NEP 2020

*Raj Jais*  
Dy. Registrar  
(Academic)  
University of Rajasthan  
JAIPUR *Bas*

**Foundations of English Language: A Comprehensive Introduction**

2023-24

Semester I

General English

Credit: 2

Duration: 3 hrs

Max. Marks: 50

(40 + 10)

The syllabus aims at achieving the following objectives:

1. Enhancing vocabulary with different types of words
2. Translation from Hindi to English and vice versa
3. Reinforcing selected components of grammar and usage
4. Strengthening comprehension of poetry, prose and short-stories
5. Strengthening compositional skills in English for paragraph writing. CVs and job applications.

The Pattern of the Question Paper will be as follows:

**Unit I: Vocabulary and Translation**

1. Homophones and Homonyms
2. Translation of 05 Words from Hindi to English  
from English to Hindi

(20 marks) (5)

(05)

(07)

(07)

**Unit II: Grammar and Usage**

3. Elements of a Sentence
4. Tense
5. Punctuation of a Short Passage with 10 Punctuation Marks  
(As discussed in Quirk and Greenbaum)

(15 marks) (5)

(05)

(05)

(05)

**Unit III: Comprehension**

Following Essays and Stories in *Essential Language Skills* revised edition compiled by Macmillan for University of Rajasthan General English B. A. /B. Com./B. Sc.

Candidates will be required to answer 5 questions out of ten questions from the prescribed texts. Each question will be of two (5) marks. (25)

(45 marks) (10)

6. Bernard Shaw *Spoken English and Broken English*
7. Ruskin Bond *Night Train at Deoli*
8. M.K. Gandhi *The Birth of Khadi*

9. The candidates will be required to answer 5 questions from an unseen passage. (15)

10. One vocabulary question of 5 words from the given passage. (5)

**Unit IV: Compositional Skills**

11. Formal Letter and Writing Emails
12. Paragraph Writing

(20 marks) (20)

(10)

(10)

Recommended Reading:

PJ/Vay  
DY Registrar  
(General Ed)  
University of Rajasthan  
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Sasikumar, V., Dutta and Rajeevan, A Course in Listening and Speaking-I Foundation Books. 2005.

Sawhney, Panja and Verma eds. English At the Workplace, Macmillan 2003.

Singh, R.P. Professional Communication. OUP. 2004

Judith Leigh. CVs and Job Applications. OUP. 2004

Arthur Waldhorn and Arthur Zeiger, English Made Simple. Upa and Co.

Gunashekar ed. A Foundation English Course for Undergraduates. Book I, CIEFL, Hyderabad.

Quirk and Greenbaum: A University Grammar of English Longman, 1973

**Foundations of English Language: A Comprehensive Introduction**  
**2023-24**  
**Semester II**

**Credit: 2**

**Duration: 3 hrs**

**Max. Marks: 50**

(40+10)

**The syllabus aims at achieving the following objectives:**

1. Enhancing vocabulary with different types of words
2. Translation from Hindi to English and vice versa
3. Reinforcing selected components of grammar and usage
4. Strengthening comprehension of poetry, prose and short-stories
5. Strengthening compositional skills in English for paragraph writing. CVs and job applications.

The Pattern of the Question Paper will be as follows:

**Unit I: Vocabulary and Translation**

1. One Word Substitution, Antonyms & Synonyms
2. Translation of 05 Sentences :from Hindi to English  
:from English to Hindi

(~~25~~ marks) (5)

(10)  
(10)

**Unit II: Grammar and Usage**

3. Transformation of Sentences
  - a. Direct and Indirect Narration
  - b. Active and Passive Voice
4. Modals

(~~20~~ marks) (5)

(10)

**Unit III: Comprehension**  
**marks)**

(10) (10)  
(25)

Following Essays and Stories in *Essential Language Skills* revised edition compiled by Macmillan for University of Rajasthan General English B. A. /B. Com./B. Sc.

Candidates will be required to answer 2 questions out of four questions from the prescribed texts. Each question will be of five (5) marks. (10)

5. J.L. Nehru

*A Tryst with Destiny*

6. Martin Luther King Jr.

*I have a Dream*

Pj / Jay

Ray

7. The candidates will be required to answer 5 questions from an unseen passage.

8. One vocabulary question of 10 words from the given passage.

**Unit IV: Compositional Skills**

9. CV's and Job Applications (Cover Letter) and Newspaper Report

(10)  
(5)  
~~(30 marks)~~ (20)

**Recommended Reading:**

Sasikumar, V., Dutta and Rajeevan, A Course in Listening and Speaking-I Foundation Books. 2005.

Sawhney, Panja and Verma eds. English At the Workplace, Macmillan 2003.

Singh, R.P. Professional Communication. OUP. 2004

Judith Leigh. CVs and Job Applications. OUP. 2004

Arthur Waldhorn and Arthur Zeiger, English Made Simple. Upa and Co.

Gunashekar ed. A Foundation English Course for Undergraduates. Book I, CIEFL, Hyderabad.

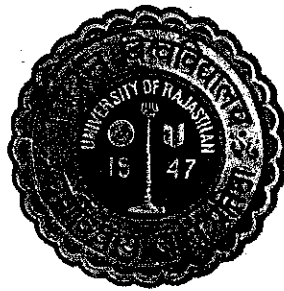
Quirk and Greenbaum: A University Grammar of English Longman, 1973

R. J. Jay

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**Syllabus of Value Added Courses  
As per UGC Curriculum and CBCS  
Framework for Undergraduate Programmes  
under NEP 2020  
For  
Undergraduate Courses (Semester I/II)  
In  
Faculties of Arts/Science/Commerce/Fine  
Arts/Social Sciences  
w.e.f. Academic Session 2023-2024**

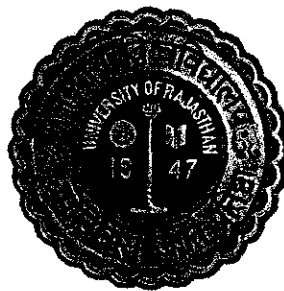


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**List of Value Added Courses  
As per NEP-2020  
For  
Undergraduate Courses (Semester I/II)  
In Faculties of Arts/Science/Commerce/Fine  
Arts/Social Sciences  
w.e.f. Academic Session 2023-2024**



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**List of Value Added Courses**  
**As per NEP-2020**  
**For**  
**Undergraduate Courses (Semester I/II)**  
**In Faculties of Arts/Science/Commerce/Fine Arts/Social Sciences**  
**w.e.f. Academic Session 2023-2024**

1. Anandam
2. Digital Enhancement
3. Understanding Indian Society & Culture
4. Nutrition for Health and Fitness
5. Geriatric Wellness and Care
6. National Cadet Corps(NCC)-I (Semester-I)
7. Indian Value System ()
8. National Service Scheme (NSS)-I (Semester-I)
9. Financial Literacy
10. National Cadet Corps(NCC)-II (Semester-II)
11. National Service Scheme (NSS)-II(Semester-II)

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NEP-2020 based Syllabus  
For  
Value Added Courses for Semester I and II in UG Programmes  
(2 credits/semester for Semester I/II.)  
VAC-1

1	Title of course- A n a n d a m	
2	Nodal Department of HEI to run course	Sociology.
3	Nature of course- Independent/Progressive	No
4	Number of Seats-	60 students per batch
5	Course Code-.....	Credits-02(1Theory OR 2Practical Hours per week)
6	Scheme of Examination Maximum Marks Minimum Marks	Annexure-I (Attached) 50 20
7	Is this course is based on Outside Partners/Institutions/Industry/ Govt. Org. etc. ?	Yes <input type="checkbox"/> No <input type="checkbox"/>
8	If Yes, Name of proposed Outside Partners /Institutions /Industry/ Govt. Org. etc.	Any Government Organization and NGOs
9	<p><b>Syllabus</b></p> <ul style="list-style-type: none"> <li>• Individual Activities</li> <li>• Group Activities</li> <li>• 1 hour lecture per week</li> <li>• Report of Group Project</li> <li>• Lecture/Webinar, Interactive Session to be organized in College for students on Anandam Day (Last Working Day of every Month)</li> </ul> <p><b>Guidelines</b></p> <ul style="list-style-type: none"> <li>• Adopt an area/colony/office to train people about plastic/organic waste disposal.</li> <li>• Form a group to ensure that injured and sick cows and other animals in your area are taken care of.</li> <li>• Adopt an area/colony to rectify issues related to water /electricity/ waste disposal/ road safety/pollution, etc.</li> <li>• Create a book/food/clothes/mobile/equipment bank and distribute it to the needy.</li> <li>• To Monitor unauthorized cutting of trees and related issues.</li> <li>• Engage in massive plantation and afforestation programs.</li> <li>• Adopt local heritage sites or spots of tourist interest and work for its restoration and publicity on tourist guide maps.</li> <li>• Coordinate with hospitals / NGOs and organise medical check-up camps for children/women in poor localities.</li> <li>• Form drug/alcohol de-addiction help-groups and motivate people.</li> <li>• Organize Vocational Skill Training Programs in juvenile jails and women homes.</li> <li>• Form a group to help workers/house maids to make cooperatives for small scale loans.</li> <li>• Form a group to monitor and resolve eve-teasing/ harassment of women, children and old people.</li> <li>• Form a group to restore and publicise local art-forms like weaving/ dyeing, maandna, folk songs, old manuscripts, etc</li> </ul>	

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- Form age/gender specific groups for collective yoga/meditation in a community, society, hostel, etc.
- Form a group to restore wells/step wells/ponds or other similar water sources.
- Form a group to motivate people to employ rain water harvesting and solar energy harvesting techniques.
- Form a group to maintain a public garden/park for the residents of a particular area.
- To train youngsters about computer programming and apps.
- Engage in " Beti Bachao Beti Padhao" programs for over all development and empowerment of girl child in your locality.
- Innovate/Design Simple technology using local resources that saves labour time of labourers and poor farmers and impacts their lives positively.
- E-literacy programs, to help organizations/individuals with email and websites, etc.
- Time giving activities to adopted communities for spreading awareness regarding Govt. programmes/Schemes.
- Sports activities like yoga, meditation, drills and physical exercises in adopted areas
- Spread awareness about dental care, first-aid training, etc.
- Form group for attending to old people to assist them for market and groceries, etc.

**Annexure-1**

**Examination Scheme:**

**Programme Evaluation Methods:**

S.No.	Parameters	Max. Marks
1	Entries in Daily Diary	05
2	Synopsis of Project	10
3	Participation in Anandam Day ( Last working day of every month)	10
4	Report of Group Project	25
	Total	50

**Evaluation of Group Projects (25 Marks)**

S.No.	Parameters	Max. Marks
1	Presentation/Video/Photographs submitted with Report	05
2	Media Report of Certificate from Govt. Organization/NGO/Community Forum/ Social Organisation Etc.	10
3	Challenging Issues / Problem Solving/ Innovation addressed in Project Report	10
	Total	25

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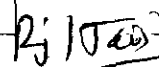
**University of Rajasthan**  
**NEP-2020 based Syllabus**  
**For**  
**Value Added Courses for Semester I and II in UG Programmes**  
**(2 Credits/ semester for Semester I and II)**  
**VAC-2**

1	<b>Title of course-Digital Enhancement</b>	
2	<b>Nodal Department of HEI to run course</b>	<b>All College Units</b>
3	<b>Broad Area/Sector-</b>	<b>ICT Tools</b>
4	<b>Number of Seats-</b>	<b>60 students per batch</b>
5	<b>Course Code-.....</b>	<b>Credits-02(4 Hours per week)- Presentations/ Demonstration and Group Activity</b>
6	<b>Scheme of Examination</b> Maximum Marks :50 Minimum Marks: 20	<b>Internal Assessment : 10 Marks</b> <b>EoSE : 40 marks , Duration: 2 hours</b> <b>Exam pattern : MCQ , 80 questions.</b> <b>The responsibility of conducting and evaluating the Mid Semester Assessment is vested on the teacher designated as Course Coordinator. The End-Semester Examination shall be conducted by the concerned University.</b>
7	<b>Is this course is based on Outside Partners/ Institutions/ Industry/ Govt. Org. etc. ?</b>	<b>Yes</b> <b>No</b>
8	<b>Syllabus outlines</b> <b>Unit I : Digital Inclusion and Empowerment</b> <b>Unit II : Communication and Collaboration in the Cyberspace</b> <b>Unit III : Towards safe and Secure Cyberspace</b> <b>Unit IV : Ethical Issues in Digital Word</b>	

- The course should be conducted in an interactive mode through demonstration, using appropriate ICT tools.
- Conduct workshops on e-services initiated under Digital India and Govt. of Rajasthan..
- Spread digital literacy/awareness amongst the vulnerable groups and marginalized sections of the society like street vendors, domestic help, security guards, senior citizens.
- Students will take up team activities/ projects exploring digital services in the areas such as education, health, planning, farming, security, cyber security, financial inclusion, and justice, e-Kranti.
- Any other Practical/ Practice as decided from time to time.

**Unit wise Details of the Value Added Course**

<b>Particulars</b>	<b>Presentations cum Practice Hours with individual and group activity. (30×2=60)</b>
<b>Unit I: Digital inclusion and Digital Empowerment</b>	<b>20</b>
<ul style="list-style-type: none"> <li>• Needs and challenges</li> <li>• Vision of Digital India: DigiLocker, E-Hospitals, e-Pathshala, BHIM, Swayam Portal, e-Kranti (Electronic Delivery of Services), e-Health Campaigns. Digital Signature.</li> <li>• Public utility portals of Govt. of India such as RTI, Health, Finance, Education, SSO-ID.</li> </ul>	

  
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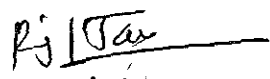
<b>Unit II: Communication and Collaboration in the Cyberspace</b>	<b>16</b>
<ul style="list-style-type: none"> <li>• Electronic Communication: electronic mail, blogs, social media tools</li> <li>• Collaborative Digital platforms</li> <li>• Tools/platforms for online learning</li> <li>• Collaboration using files haring, messaging, video conferencing</li> </ul>	
<b>Unit III: Digital Safety Measurement Tools.</b>	<b>16</b>
<ul style="list-style-type: none"> <li>• Online security and privacy</li> <li>• Threats in the digital world: Various forms of Viruses, Data breach and Cyber Attacks</li> <li>• Blockchain Technology</li> <li>• Security Initiatives by the Gov tof India</li> </ul>	
<b>Unit IV: Ethical Issues in Digital World</b>	<b>8</b>
<ul style="list-style-type: none"> <li>• Emerging Technologies: Overview of Cloud Computing,</li> <li>• Big Data, Internet of things, Virtual reality, Robotics, Artificial intelligence,</li> <li>• 3-D Printing, Future of digital technologies.</li> </ul>	
<b>Total</b>	<b>60 hours</b>
<b>Requisite: Basic knowledge of Computer Applications.</b>	

#### Suggested Books/References/Weblinks(if available)

<b>(a)</b>	<b>Books:</b>	<b>Essential Readings / Online Resources</b> <ul style="list-style-type: none"> <li>• Rodney Jones and Christopher Hafner. "Understanding digital Literacies: A PracticalIntroduction" Routledge Books, 2<sup>nd</sup> edition, 2021.</li> <li>• M.Swan, "Blockchain: Blueprint for a new economy, O'Reilly Media,2015.</li> <li>• K.Chandrasekhran, "Essential of Cloud Computing", CRC Press, 2014</li> <li>• P.Kumar et al., "Emerging Technologies in Computing: Theory, Practice and Advances, CRC Press, Routledge, Taylor &amp; Francis Group, , 1stEdn, 2021.</li> <li>• <a href="https://www.digitalindia.gov.in">https://www.digitalindia.gov.in</a></li> <li>• <a href="https://www.digilocker.gov.in">https://www.digilocker.gov.in</a></li> <li>• <a href="https://www.cybercrime.gov.in">https://www.cybercrime.gov.in</a></li> <li>• <a href="https://www.cybersafeindia.in">https://www.cybersafeindia.in</a></li> <li>• <a href="https://www.meity.gov.in/cyber-surakshit-bharat-programme">https://www.meity.gov.in/cyber-surakshit-bharat-programme</a></li> </ul>
<b>(b)</b>	<b>References:</b>	<b>Suggested Readings</b> <ul style="list-style-type: none"> <li>• David Sutton. "Cyber security: A practitioner's guide", BCS Learning &amp; Development Limited, UK, 2017.</li> <li>• <a href="https://www.mha.gov.in/document/downloads/cyber-safety-handbook">https://www.mha.gov.in/document/downloads/cyber-safety-handbook</a></li> </ul>

#### Programme Specific Outcome(As per the directions of UGC Framework for UG Programmes)

- Digital enhancement programs wil provide streamline processes and automate tasks, leading to increased operational efficiency. By understanding and learning about learning digital tools and technologies and optimize the workflows willreduce human error.
- To empower individuals to work more productively. With access to digital tools, automation, and collaboration platforms, employees can streamline their work, enhance communication and collaboration, and achieve higher levels of productivity.
- Digital enhancement programs often involve upskilling and reskilling individual to adapt to new technologies and work practices. By training of digital activities one can work fast with efficiency. Enhancing digital literacy, and foster a culture of continuous learning will be developed in the student.

  
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NEP-2020 based Syllabus

For  
Value Added Courses for Semester I and II in UG Programmes  
( 2 credits/ semester for Semester I, II. )  
VAC-3

1	Title of course- <b>Understanding Indian Society and Culture</b>	
2	Nodal Department of HEI to run course	History
3	Broad Area/Sector-	Indian History
4	Number of Seats-	All students
5	Course Code-.....	Credits- 02 (2 Theory Hours per week)
6	<b>Scheme of Examination</b> Maximum Marks :50 Minimum Marks: 20	Internal Assessment: 10 Marks EoSE : 40 marks, Duration: 2 Hours Exam pattern: MCQ , 80 questions The responsibility of conducting and evaluating the Mid Semester Assessment is vested on the teacher designated as Course Coordinator. The End-Semester Examination shall be conducted by the concerned University.
7	<b>Course Objective:</b> The objective of this value-added course on the evolution of Indian society isto provides students with a comprehensive understanding of the historical, social, and cultural aspects of early and medieval Indian society. By studying various concepts, institutions, teachings, and artistic expressions, students will gain insights into the evolution of Indian society and its impact on contemporary culture. The course aims to foster critical thinking, cultural appreciation, and a deeper understanding of the roots of Indian civilization.	
8	<b>Syllabus/ Guidelines</b> <b>UNIT I</b> : Spiritual Concepts and Institutions <b>UNITII</b> : Social and Political Ideas <b>UNITIII</b> : Styles of Architecture <b>UNITIV</b> : Cultural Synthesis	

**Unit wise Details of the Value Added Course**

Unit	Title of Unit	Course Content	Theory Hours	Practical Hours
I	Spiritual Concepts and Institutions	<i>varna, ashrama, purushartha, and samskaras.</i> Teachings of Jainism and Buddhism	08	-
II	Social and Political Ideas	Social ideas as depicted in the <i>Smritis</i> with special reference to <i>Manusmriti</i> . Political Ideas in ancient India with special reference to <i>Arthashastra</i>	07	-
III	Styles of Architecture	Temple Architecture Dravida Style Nagar Style Besar Style	07	-
IV	Cultural Synthesis	Indo-Saracenic cultural synthesis- with special reference to art and literature. Development of Mughal Painting.	08	-
Total Hours			30	-

**Suggested Books/References/Web-links(if available)**

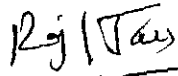

- (1) S.K. De, U.N. Ghosal et al (ed.): *The Cultural Heritage of India, Vol. II (Itihasas, Puranas, Dharma and other Shastras)*, Ramkrishna Mission, Calcutta, 2nd ed., 1962.

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- (2) P.V. Kane: *History of Dharmasastra*, 5 Vols, Bhandarkar Oriental Research Institute, Poona, 2nd ed., 1968-77. (Hindi translation of 5 vols. published by Uttar Pradesh Hindi Sansthan, Lucknow).
- (3) P.H. Prabhu :*Hindu Social Organisation*, Popular Prakashan, Bombay, 1940
- (4) N.K. Dutta :*Origin and Growth of Caste in India*, Vols. I & II, Combined Reprint, Calcutta, 1986.
- (5) Rajbali Pandey :*Hindu Samskara (The Social and Religious Study of the Hindu Sacraments)*, Varanasi (Also in Hindi), 1936
- (6) G.C. Pande :*Bharatiya Samaj - Tattvika aur AitihaskaVivechana* (in Hindi), New Delhi, 1994.
- (7) Patrick Olivelle :*The Law Code of Manu*, Oxford world Classics, 2009
- (8) Ram Sharan Sharma: *Aspects of Political Ideas and Institutions in Ancient India*. Motilal Banrassidas, Delhi, 1959
- (9) Charles Hallisey: *Therigatha – Selected Poems of First Buddhist Women*, Harvard University Press, 2015
- (10) Thomas R Trautmann; *Arthashastra – The Science of Wealth*. Random House India, 2016
- (11) J L Mehta *Advanced Study in the History of Medieval India* Vol. 3 Sterling Publication, Delhi, 2018
- (12) Sacchidanad Sahay: *Mandir Sthapatya ka Itihas*, Bihar Hindi GranthAkademi, 2013

#### Course Outcome:

This course aims to give insights into the evolution of Indian society and emphasises the development of critical thinking skills, cultural appreciation, and a deeper understanding of the roots of Indian civilization. By the end of the course, students will be able to analyse and evaluate the factors that shaped Indian society, apply their knowledge to engage in meaningful discussions and demonstrate proficiency in interpreting the historical and cultural aspects of Indian society. Moreover, students will develop a broader perspective on the interconnectedness of early and medieval Indian society with contemporary culture and society.

  
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**NEP-2020 based Syllabus**  
**For**  
**Value Added Courses for Semester I and II in UG Programmes**  
**( 2 credits/ semester for Semester I, II. )**  
**VAC-4**

1	Title of course- Nutrition for Health and Fitness	
2	Nodal Department of HEI to run course	Department of Home Science
3	Broad Area/Sector-	Nutrition and Fitness
4	Nature of course - Independent / Progressive	Progressive
5	Number of Seats-	60 students per batch
6	Course Code-.....	Credits- 02 (2 Theory Hours per week)
7	<b>Programme Objective:</b> The course has been planned to provide the student about basic concept of health, wellness and fitness. The course shall create awareness about the importance of correct dietary and physical activity practices for positive health and wellness. The student shall understand balanced diet and impact of processed foods on health. An understanding of the current health scenario in the country and globally will be imparted	
8	<b>Scheme of Examination</b> Maximum Marks :50 Minimum Marks: 20	Internal Assessment: 10 Marks EoSE : 40 marks, Duration: 2 Hours Exam pattern: MCQ , 80 questions The responsibility of conducting and evaluating the Mid Semester Assessment is vested on the teacher designated as Course Coordinator. The End-Semester Examination shall be conducted by the concerned University.

10	<b>Syllabus/ Guidelines</b> <b>Unit I : Health &amp; Fitness</b> <b>Unit II : Nutritional Guidelines</b> <b>Unit III : Processed Foods</b> <b>Unit IV: Physical Activity and Nutrition</b>
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**Unit wise Details of the Value Added Course**

Unit	Title of Unit	Course Content	Theory Hours (30)
I	Health & Fitness	<ul style="list-style-type: none"> <li>• Concept of positive Health and Wellness as per WHO Guidelines</li> <li>• Physical Fitness –definition</li> <li>• Role of Nutrition for Health and Fitness</li> </ul>	4 4
II	Nutritional Guidelines	<ul style="list-style-type: none"> <li>• Balanced Diets and Food Pyramid .</li> <li>• How to plan balanced diets for various age groups</li> <li>• Dietary Goals and Guidelines for Indians (Reference man &amp; woman)</li> </ul>	3 4
III	Processed Foods	<ul style="list-style-type: none"> <li>• Concept of Processed Foods</li> <li>• Impact of Packaged, Ultra-processed and Convenience Foods on Health</li> </ul>	3 4
IV	Physical Activity & Nutrition	<ul style="list-style-type: none"> <li>• Effects on health of Physical Activity and Dietary Habits</li> <li>• Dual Burden of Malnutrition</li> </ul>	4 4
<b>Total Hours</b>			<b>30</b>

  
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**Suggested Books/References/Web-links(if available)**

(a)	Books:	(1) M.Swaminathan (2015): Advanced Text Book of Food and Nutrition. Volume I & II. The Bangalore Press, India. (2) Ravindra Chadha & Pulkat Mathur (2015) : Nutrition and Life Cycle Approach. The Orient Blackswan; First Ed. (3) Dietary Guidelines for Indians –A Manual (2011) ,NIN, Hyderabad
(b)	References :	<a href="https://www.fao.org/3/ca5644en/ca5644en.pdf">https://www.fao.org/3/ca5644en/ca5644en.pdf</a> <a href="https://www.who.int/news-room/fact-sheets/detail/healthy-diet">https://www.who.int/news-room/fact-sheets/detail/healthy-diet</a>
(c)	Web-Links:	<a href="https://cdn.who.int/media/docs/default-source/health-promotion/framework4wellbeing_16dec22.pdf?sfvrsn=32a0e228_4&amp;download=true">https://cdn.who.int/media/docs/default-source/health-promotion/framework4wellbeing_16dec22.pdf?sfvrsn=32a0e228_4&amp;download=true</a> <a href="https://www.nin.res.in/downloads/DietaryGuidelinesforNINwebsite.pdf">https://www.nin.res.in/downloads/DietaryGuidelinesforNINwebsite.pdf</a> <a href="https://apps.who.int/iris/rest/bitstreams/1315866/retrieve">https://apps.who.int/iris/rest/bitstreams/1315866/retrieve</a> <a href="https://ncert.nic.in/textbook/pdf/iehp104.pdf">https://ncert.nic.in/textbook/pdf/iehp104.pdf</a> <a href="https://www.researchgate.net/publication/51711287_Consensus_Physical_Activity_Guidelines_for_Asian_Indians">https://www.researchgate.net/publication/51711287_Consensus_Physical_Activity_Guidelines_for_Asian_Indians</a> <a href="https://egyankosh.ac.in/handle/123456789/47981h">https://egyankosh.ac.in/handle/123456789/47981h</a> <a href="https://egyankosh.ac.in/handle/123456789/44151">https://egyankosh.ac.in/handle/123456789/44151</a> <a href="https://eppg.inflibnet.ac.in/Home/ViewSubject?catid=NuAs6SreCGryddEfs4kkBA">https://eppg.inflibnet.ac.in/Home/ViewSubject?catid=NuAs6SreCGryddEfs4kkBA</a>

**Programme Outcome**

1. Enhancing the basic understanding of nutrition and physical fitness
2. Developing a healthy attitude towards physical well being
3. Inculcating values of conscious and correct eating habits
4. Awareness generation regarding processed foods and their effects on health & wellness
5. Understanding importance of physical activity and its effect on health & wellness
6. Understanding nutrition and its effect on health and wellness


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Value Added Courses for Semester I and II in UG Programmes  
( 2 credits/ semester for Semester I, II. )  
VAC-5

1	Title of course- GERIATRIC WELLNESS AND CARE	
2	Nodal Department of HEI to run course	Department of Home Science
3	Broad Area/Sector-	HUMAN DEVELOPMENT AND FAMILY STUDIES
4	Nature of course - Independent / Progressive	Progressive
5	Number of Seats-	60 students per batch
6	Course Code-.....	Credits- 02 (2 Theory Hours per week)
7	<b>Scheme of Examination</b> Maximum Marks :50 Minimum Marks: 20	Internal Assessment: 10 Marks EoSE : 40 marks, Duration : 2 hours Exam pattern: MCQ , 80 questions The responsibility of conducting and evaluating the Mid Semester Assessment is vested on the teacher designated as Course Coordinator. The End-Semester Examination shall be conducted by the concerned University.
	<p><b>Programme Objectives:</b> The course shall give the student an understanding of role of geriatric care assistance and shall equip the student to be an effective care giver. The student shall be understand the importance of the general, medical and psychological problems faced by the elderly and be able to learn about basic first aid for elderly. An understanding of the current health scenario in the country and globally will be imparted.</p>	
8	<p><b>Syllabus/ Guidelines</b> Unit-1 : Introduction to health care of Geriatric population Unit-2 : Introduction to a Geriatric Care Assistant Programme Unit- 3 : Personal Hygiene and Health of elderly Unit-4 : Basic applied knowledge for Geriatric Care</p>	

Unit wise Details of the Value Added  
Course

Unit	Title of Unit	Course Content	Theory Hours	Practical Hours
UNIT-I	Introduction to healthcare of Geriatric population	a) Health care delivery system in India at primary, secondary and tertiary care, Community participation in health care delivery system	4	
		b) Basic medical, psychological and nutrition related terminologies; Issues in Health Care Delivery System in India.	3	
		c) Role of a Geriatric Care Assistant, Do's and Don'ts; Requirements to become a Certified Geriatric Care Assistant	4	

  
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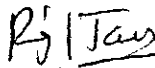
UNIT-II	Introduction to a Geriatric Care Assistants	d) Basics of emergency care and life support skills-Vital signs, first aid and triage e) Identifying signs and taking measures for elderly emergency conditions e.g. Stroke, falls, injuries, accidents, cuts, bruises and sprain, Asthma attack, Gastro-Intestinal disorders, Hypothermia and fever, Dental problems, Vision and Hearing problems, Bacterial, fungal, urinary tract infections, Depression and Dementia and any other conditions	2 5	
UNIT- III	Personal Hygiene and Health of elderly	f) Understanding and procedures of Hygiene and prevention of infection including effective hand washing, bathing, drying, grooming etc g) Vaccination protocol against common Infectious diseases: immunization to reduce the health risks for care giver and patients.	3 3	
UNIT-IV	Basic applied knowledge for Geriatric Care	h) Understanding working systems for geriatric care institutions like hospital and old age Home i) Basic first aid for elderly population j) Leisure activities for elderly- importance and types of leisure activities	2 2 2	
		Total	30	

**Suggested Books/References/Web-links(if available)**

(a)	Books:	(1) NurseAssistantTrainingTextAmericaRedcross2013 (2) Draft Short Term, Training Curriculum Handbook of General Duty Assistant MOHFW. Govt.of India. (3) Draft of S.TTC Hand book of Hons. Health Aide MOHFN,GOI
(b)	References:	Manual on Geriatric care, MOHFW ,Dept. of Ayush GOI

**Programme Outcome**

- (1) Understanding the health care in India
- (2) Understanding the role of a Geriatric care Assistant
- (3) Skilled and Trained caretakers for geriatric population

  
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For  
Value Added Courses for Semester I and II in UG Programmes  
( 2 credits/ semester for Semester I, II. )

VAC-6

1.	Title of course-	NCC -1 (Semester-I)	
2	Nodal Department of HEI to run course	NCC Incharge of University	
3	Broad Area/Sector-	Participation in NCC	
4	Sub Sector-	College NCC Units	
5	Nature of course-Independent/Progressive	Progressive	
6	Number of Seats-	As per Vacancies allotted by DG NCC	
7	Course Code- 04	Credits-02(1Theory & 2 Practical Hours per week)	
8	Scheme of Examination Max Marks... Minimum Marks:	As per SNCCO Sept 2022 (Annexure-2) 50 20	
9	Is this course is based on Outside Partners/Institutions/Industry/ Govt. Org. etc. ?	Yes	No
10	If Yes, Name of proposed Outside Partners/Institutions/Industry/ Govt. Org. etc.	NCC office, Jaipur	
11	<p><b>Objective of NCC</b></p> <p>The National Cadet Corps (NCC) is one of the largest youth organizations in India, with a primary objective of developing character, discipline, and leadership qualities among the youth. Established in 1948, the NCC has played a significant role in shaping the future generations of the country. Its core values, such as unity, discipline, and secularism, contribute to fostering national integration and a sense of pride among the cadets.</p> <ul style="list-style-type: none"> <li>• The NCC operates under the Ministry of Defence and has a presence in various educational institutions, including schools and colleges. It provides young boys and girls with a platform to develop their personality, physical fitness, and social awareness. The NCC motto, "Unity and Discipline," encapsulates its fundamental principles and the goals it strives to achieve.</li> <li>• One of the primary objectives of the NCC is to develop leadership qualities among the cadets. Through various training activities, including drill exercises, obstacle courses, and team-building exercises, the NCC instills in its cadets the ability to lead and inspire others. Cadets are taught to make quick decisions, take responsibility, and work in teams. These leadership skills are not only beneficial during the NCC training but also in all aspects of life, be it academics, career, or personal relationships.</li> <li>• Another crucial objective of the NCC is to foster national integration. India is a diverse nation, with numerous languages, religions, and cultures. The NCC embraces this diversity and promotes a sense of unity among its cadets. Regardless of their background, religion, or region, cadets come together under the common goal of serving the nation. The NCC emphasizes the importance of unity in diversity and encourages cadets to respect and appreciate different cultures and traditions.</li> <li>• The NCC also aims to create responsible and disciplined citizens. Cadets are required to adhere to a strict code of conduct, which includes punctuality, respect for authority, and ethical behavior. These principles help in molding the character of the cadets and preparing them for the challenges of life. The NCC believes that disciplined individuals contribute positively to society and uphold the values of integrity and honesty.</li> <li>• Moreover, the NCC plays a vital role in providing cadets with opportunities to engage in social service activities. The organization encourages cadets to actively participate in community development projects, blood donation drives, and environmental conservation initiatives. These activities not only develop a sense of empathy and social responsibility but also nurture a spirit of selflessness and service towards the nation.</li> <li>• Furthermore, the NCC aims to create a pool of talented and responsible youth who can contribute to the defense services of the country. Many NCC cadets choose to pursue a career in the armed forces or other uniformed services, where they can utilize their skills and training to serve the nation. The NCC provides a strong foundation for such individuals, preparing them physically, mentally, and emotionally for the challenges of these professions.</li> </ul>		

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12	Syllabus Semester -I Total Hours- 15 (Credits-01) Practical- 30 Hours (Credits-01)
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**Unit wise Details of the Value Added Course (Semester-I)**

Unit	Title of Unit	Course Content	Theory Hours	Practical Hours
I	NCC General	Aims, Objectives and Org of NCC, Incentives, Duties of NCC Cadets, NCC Camps: Types and Conduct	1 2 1	30
II	National Integration and Awareness	National Integration: Importance and Necessity, Factors affecting National Integration, Unity in Diversity, Threats to National Security	2 1 1 1	
III	Personality Development	Factors, Self-Awareness, Empathy, Critical and Creative Thinking, Decision Making and Problem Solving	1 2	
IV	Social Service and Community Development	Basics of Social Service, Rural Development Programmes, NGO'S, Rural Development Programmes, Contribution of Youth	3	
Total Hours			15	30

**Suggested Books/References/Web-links(if available)**

**Books:**

1. NCC Hand Book
2. Pamela Martinez, Critical Thinking: Decision Making, Problem Solving and Self
3. Development (Effective Strategies That Will Make You Improve Critical Thinking) Carl Patterson, Critical Thinking Skills: Practical Tools for Rational Thinking and Deep Analysis to Boost Your Brainpower. Adopt Logic Strategies to Find Intelligent and Effective Solutions to Challenges
4. P. Gopinadhan Pillai, Rural Development in India

**Web-Links:**

1. <https://indiancc.nic.in>
2. <https://www.researchgate.net/publication/357839324> NATIONAL INTEGRATION OF INDIA AND THE OBSTACLES IN ITS WAY STATE RESPONSE AND ITS REMEDIES
3. <https://www.vedantu.com/english/importance-of-national-integration-essay>

**Programme Specific Outcome( As per the directions of UGC Framework for UG Programmes)**

Programme Specific Outcomes (PSOs) are statements that describe what students are expected to know and be able to do by the time they complete a specific program or course of study. In the case of the National Cadet Corps (NCC), the PSOs focus on the unique learning outcomes that cadets should achieve through their participation in the NCC program.

The NCC is a youth organization in many countries, including India, designed to develop character, discipline, and leadership skills among young people. It aims to create a pool of disciplined and motivated youth who can serve as future leaders in various fields. The PSOs of NCC encompass a wide range of skills and qualities that cadets are expected to acquire during their NCC journey.

1. **Leadership Skills:** One of the primary PSOs of NCC is to develop leadership skills among cadets. Through various training activities, including leadership camps, command tasks, and practical exercises, cadets learn to lead and motivate their peers. They develop qualities like decision-making, effective communication, teamwork, and problem-solving skills, which are essential for effective

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2. **Discipline and Time Management:** NCC instills a sense of discipline and time management in cadets. They learn to follow rules and regulations, maintain punctuality, and develop a strong work ethic. Cadets are taught to manage their time effectively to balance their academic commitments and NCC activities, which helps them become more organized and efficient individuals.
3. **Physical Fitness:** Physical fitness is an important aspect of NCC training. Cadets engage in regular physical activities, including drill exercises, sports, and adventure activities, to enhance their fitness levels. The PSO focuses on improving their endurance, strength, agility, and overall physical well-being.
4. **Social Awareness and Responsibility:** NCC promotes social awareness and a sense of responsibility towards the community and the nation. Cadets are exposed to various social issues and are encouraged to actively participate in social service activities such as cleanliness drives, blood donation camps, and awareness campaigns. They develop empathy, compassion, and a sense of civic duty.
5. **National Integration and Cultural Understanding:** NCC fosters national integration and cultural understanding among cadets. It brings together young people from diverse backgrounds and provides a platform for them to interact and appreciate different cultures, languages, and traditions. Cadets learn to respect and value the rich cultural heritage of their country and develop a sense of unity and brotherhood.
6. **Self-Confidence and Self-Development:** NCC aims to boost the self-confidence and overall personality development of cadets. Through various activities like public speaking, personality development sessions, and exposure to challenging situations, cadets learn to overcome their fears and develop a positive self-image. They gain confidence in their abilities and become more self-assured individuals.
7. **Crisis Management and Disaster Preparedness:** NCC equips cadets with the skills and knowledge necessary to respond effectively in crisis situations and natural disasters. They receive training in first aid, disaster management, and rescue operations. Cadets learn to remain calm under pressure, make quick decisions, and provide assistance to those in need.
8. **Ethics and Values:** NCC emphasizes the importance of ethics, values, and integrity. Cadets are encouraged to uphold moral and ethical principles in all aspects of life. They learn to distinguish between right and wrong, and develop a strong sense of integrity, honesty, and accountability.
9. **Teamwork and Interpersonal Skills:** NCC focuses on developing teamwork and interpersonal skills among cadets. They learn to work collaboratively in a team, respect diversity, and effectively communicate with others. Cadets understand the significance of cooperation and coordination in achieving common goals.
10. **Environmental Awareness and Conservation:** NCC promotes environmental awareness and conservation among cadets. They learn about environmental issues, sustainable


**Annexure-2**

**Examination Scheme (Programme Evaluation Methods)**

Sr. No.	Parameters	Max Marks
1.	Entries in Daily Diary	05
2.	Synopsis Project - NCC General	10
3.	Participation in NCC training	10
4.	Participation in Social Service and Community Development (SSCD)	25*
Total		50

**\*Evaluation of SSCD:**

Sr. No.	Parameters	Max Marks
1.	Presentation/Video/Photographs submitted with report	05
2.	Day Significance	10
3.	Participation in Puneet Sagar, Swachh Bharat, quiz, Social Awareness and Jagrukata Rally etc.	10
Total		25

  
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**For**  
**Value Added Courses for Semester I and II in UG Programmes**  
**(2 credits/ semester for Semester I, II.)**  
**VAC-7**

1	Title of course - <b>Indian Value System- Bhāratīya Mūlyamīmāsā-I</b>	
2	Nodal Department of HEI to run course	Philosophy
3	Broad Area/Sector-	Understanding Indian value System
4	Nature of course - Independent / Progressive	Progressive
5	Number of Seats-	60 students per batch
6	Course Code-.....	Credits- 02 (2 Theory Hours per week)
7	<b>Scheme of Examination</b> Maximum Marks :50 Minimum Marks: 20	Internal Assessment : 10 Marks EoSE : 40 marks, Duration : 2 Hours Exam pattern: MCQ , 80 questions The responsibility of conducting and evaluating the Mid Semester Assessment is vested on the teacher designated as Course Coordinator. The End-Semester Examination shall be conducted by the concerned University.
8	<b>Objectives:</b> The objective behind this course is to introduce to the students, the long tradition, plurality, depth, and perennial nature of Axiology, i.e., Philosophy of Value in classical texts of Indian philosophy	
9	<b>Syllabus/ Guidelines</b>	
	<b>Unit I:</b>	
	1. An introduction to the meaning of philosophy and axiology ,i.e. ,philosophy of values. Origins and Nature of Indian Philosophy	
	2. Ethical concepts in Vedic corpus: Ṛta,Ṛṇa, Yajna, Śreyas-preyas, Vasudhaiva Kutumba kama	8 Lectures
	<b>Unit II:</b>	
	3. Puruṣārtha- types and role in holistic development of human life.	
	4. Upaniṣds: Tyaga and Bhoga (Iṣa), Taittirīya: Pañcakoṣa	8 Lectures
	<b>Unit III:</b>	
	5. Conception of Dharma- Sādhāraṇa and ĀpadDharmaasin: Mahābhārata, Bhagawadgīta, Kaṇāda, Manu	4 Lectures
	6. Jaina Ethics: Triratna, Pañca Mahāvratā: Satya-Ahimsa-Asteya, Aparigraha, Brahmacharya	4 Lectures
	<b>Unit IV:</b>	
	7. Niṣkāma Karma Yoga of Gītā, Lokasamgraha	6 Lectures

**Suggested Books/References/Web-links(if available)**

1. I.C.Sharma :Ethical Philosophies of India.
2. S.K. Maitra :The Ethics of the Hindus.
3. Surama Dasgupta :Development of Moral Philosophy in India.
4. M. Hiriyanna :The Indian Conception of Values.
5. P.V. Kane :The History of Dharmasastras Vol.I(Hindi translation available)
6. J.N. Sinha :A Manual of Ethics(Hindi translation available)
7. दिवाकर पांडेय भारतीय नीति शास्त्र
8. संगमलाल पांडेय नीति दर्शन का संवेक्षण

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**Outcomes:**

- Students should get a picture of the history of Indian value system
- Students should be able to understand the basic currents and concepts of classical Indian philosophy of values.
- Students should be able to grasp the fundamental philosophical foundations of Indian value system.
- Students should be able to identify perennial values of Indian culture.
- Students should be able to understand the impact of Indian ethics and philosophy on Indian culture.

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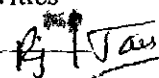
For

Value added courses for Semester-I and II in UG Programmes

(2 Credits/ semester for I, II semester)

VAC-8

1.	Title of Courses	National Service Scheme (NSS)-1
2.	Nodal Department of HEI to run course	NSS Coordinator of University
3.	Hours	60 Hours per semester
4.	No. of seats	100 students in each NSS unit
5.	Course Code	
6.	Scheme of Examination	Annexure-3 (Attached)
7.	Maximum marks	50
	Minimum marks	20
8.	In the course is based on outside partners/ Institutions/ Industries/ Govt. organization etc.	Yes / No
9.	If yes, Name of proposed outside partners/ Institutions/ Industries/ Govt. organization etc.	Regional Directorate, National Service Scheme Jaipur, Rajasthan
10.	<p><b>National Service Scheme (NSS)</b> The National Service Scheme (NSS) is an Indian government sector public service program conducted by the Ministry of Youth Affairs [1] and Sports of the Government of India. Popularly known as NSS, the scheme was launched in Gandhiji's Centenary year in 1969. Aimed at developing student's personality through community service, NSS is a voluntary association of young people in Colleges, Universities and at +2 level working for a campus-community (esp. Villages) linkage.</p> <p><b>Objectives of NSS:</b></p> <p><i>The main objectives of National Service Scheme (NSS) are</i></p> <ul style="list-style-type: none"> <li>• understand the community in which they work</li> <li>• understand themselves in relation to their community</li> <li>• identify the needs and problems of the community and involve them in problem-solving</li> <li>• develop among themselves a sense of social and civic responsibility</li> <li>• utilise their knowledge in finding practical solutions to individual and community problems</li> <li>• develop competence required for group-living and sharing of responsibilities</li> <li>• gain skills in mobilising community participation</li> <li>• acquire leadership qualities and democratic attitudes</li> <li>• develop capacity to meet emergencies and natural disasters and</li> <li>• practise national integration and social harmony</li> </ul>	
11	<p><b>Syllabus Guidelines:</b> <b>Theory Weight -15</b> <b>Practical/Project-work-30hours+ 15 hours (Project-work, Field Visits/Trainings)</b></p> <p><b>Unit-01: Introduction to NSS: Origin and concepts of NSS (3)</b></p> <ol style="list-style-type: none"> <li>a) History, philosophy, aims &amp; objectives of NSS</li> <li>b) Emblem, flag, motto, song, badge etc.</li> <li>c) Organizational structure</li> <li>d) Roles and responsibilities of various NSS functionaries</li> </ol> <p><b>Unit-02: NSS Programmes and Activities (5)</b></p> <ol style="list-style-type: none"> <li>a) Concept of regular activities, One day camps</li> <li>b) Basis of adoption of slum /village, methodology of conducting survey</li> <li>c) Youth development programmes/ schemes of Govt. of India</li> <li>d) Collaboration with different agencies</li> </ol> <p><b>Unit-03: Understanding demography of adopted Slum (4)</b></p> <ol style="list-style-type: none"> <li>a) Survey to understand various problems in the society</li> <li>b) Awareness programmes (Human rights, cleanliness programme etc.)</li> <li>c) Development of slums through various awareness activities</li> <li>d) Shramdaan</li> </ol>	

  
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- ... KNOW YOUR CULTURE (3)
- Heritage and culture of the state
  - Heritage and culture of the country
  - Integration Programmes
  - Youth exchange programmes

### Suggested books/ references/ websites

- NSS Manual
- <https://nss.gov.in>
- yas.nic.in

### Programme Specific Outcomes

- **Volunteership:** to make students understand the role of a volunteer and need of volunteership in Society.
- **Community participation:** Adoption of slum under this scheme is a better way to connect students with the society through which they can understand the society at grass root level
- **Youth development:** Various activities undertaken under scheme support overall development of youth, Participation of youth at various District, state, national and international camp supports that.
- **Leadership skills:** Promoting volunteership skills amongst students develops leadership skills in them.
- **Social awareness:** Activities like blood donation camp, Swachh bhara abhiyan, run for unity, HIV/ AIDS awareness, beti bachao beti padhao, voter awareness etc. builds social awareness among students.
- **Social harmony and community development:** Participation of students in community awareness activities promotes better connect with the society and developing understanding and builds harmony.
- **Integration:** Various camps like National Integration Camp and Youth Exchange Programmes integrate youth and understand culture.
- **Know your culture:** Activities that promote better understanding of heritage and culture is also a major concern of the syllabus.

Annexure-3

### Examinations Scheme (Programme Evaluation Methods)

Sr. No.	Parameters	Max Marks
1.	Attendance	5
2.	Entries in Daily diaries	10
3.	Awareness Camps	10
4.	Participation in Social Service and Community Development (SSCD)	*25
	Total	50

#### \* Participation in Social Service and Community Development (SSCD)

Sr. No.	Parameters	Max Marks
1.	Presentation/ Video/ Photographs submitted with Diary	5
2.	Significance of various days	10
3.	Participation in Blood donation, Swachh bhara abhiyan, quiz, social awareness and jagrukta railies, run for unity, yoga day, voter awareness and similar kind of activities.	10
	Total	25

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(2 Credits/ semester for I, II semester)  
VAC-9

1.	Title of Courses	<b>Financial Literacy</b>
2.	Nodal Department of HEI to run course	Department of EAFM
3.	Hours	60 hours
4.	No. of seats	60 students per batch
5.	Course Code _____	Credits-02(4 Hours per week)- Presentations/ Demonstration and Group Activities *
6.	<b>Scheme of Examination</b> Maximum Marks :50 Minimum Marks: 20	<b>Internal Assessment: 10 Marks</b> <b>EoSE : 40 marks, Duration: 2 Hours</b> Exam pattern: MCQ , 80 questions The responsibility of conducting and evaluating the Mid Semester Assessment is vested on the teacher designated as Course Coordinator. The End-Semester Examination shall be conducted by the concerned University.
7.	In the course is based on outside partners/ Institutions/ Industries/ Govt. organization etc.	Yes / No
8.	If yes, Name of proposed outside partners/ Institutions/ Industries/ Govt. organization etc.	-
9.	<b>Learning Objectives</b> The Learning objectives of this course are as follows: • Familiarity with different aspects of financial literacy such as savings, investment, taxation, and insurance. • Understand the relevance and process of financial planning • Promote financial well-being	
10.	<b>Syllabus Guidelines</b> <b>UNIT – I Financial Planning and Financial Products</b> <b>UNIT – II Banking and Digital Payment</b> <b>UNIT – III Investment Planning and Management</b> <b>UNIT – IV Personal Tax</b>	

**\*Note :**

- Total Duration of this course = 15 Weeks
- 2 Lectures of 2 Hours each shall be conducted every Week

**Unit wise Details of the Value Added Course**  
**Detailed Syllabys for VAC-10 (FINANCIAL LITERACY)**

**UNIT – I Financial Planning and Financial Products (4 Weeks)**

Introduction to Saving : Basics of Savings, Must Need Habit, Essential Component of Good Budgeting, Prevent Financial Emergencies and Uncertainties, Control the Spendings

Time Value of Money: Simple Interest and Compound Interest, Effective Rate of Interest, Annuity, Brief about Present Value and Future Value, Applications, Sinking Fund, Net Present Value (NPV), Compound Annual Growth Rate, Perpetuity

Management of Spending and Financial Discipline: Managing, Controlling and Analyzing the expenses, Brief about Financial Discipline, Key Elements of Financial Discipline

**UNIT – II Banking and Digital Payment (3 Weeks)**

Banking Products and Services: Deposit Accounts, Loan and Advances Accounts, Investment Services, Insurance Schemes, Forex and General Utilities

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Mobile Banking (Immediate Payment Service (IMPS), Real Time Gross Settlement (RTGS), National Electronic Fund Transfer (NEFT)), Unified Payments Interface (UPI) & Bharat Interface for Money (BHIM), Mobile Wallets, Aadhaar Enabled Payment System (AEPS), Unstructured Supplementary Service Data (USSD), E-Rupi, Advantages and Disadvantages of Digital Payments and Transactions  
Security and Precautions against Ponzi Schemes and Online Frauds: Security and Control against Cyber Frauds, Precautions Against Investment Scams and Ponzi Schemes

**UNIT – III Investment Planning and Management (4 Weeks)**

Investment Opportunity and Financial Products: Introduction to Investments and Types of Investments, Return On Investments, Risk and Diversification

Brief about Financial Products: Securities and Stocks, Mutual Funds

Exchange Traded Funds (ETFs) and Index Funds, Bonds, Derivatives

Commodities, Currencies

Insurance Planning and Insurance Schemes: Introduction- Various Types of Insurance: Life Insurance, Non-Life Insurance (Medical Insurance, Fire Insurance, Property Insurance, Motor Insurance, Home Insurance, General Insurance, Travel Insurance

Importance of Insurance Planning

**UNIT – IV Personal Tax (4 Weeks)**

Introduction to Basic Tax Structure in India for Personal Taxation :Basic Concepts of Taxation, Residential Status and Scope of Income, Brief about Heads of Income

Aspects of Personal Tax Planning: Reduction of Tax Liability

Exemptions and Deductions for Individuals: Income Which Does Not Form Part of Total Income,

Deduction Under Heads of Income, Deduction from Gross Total Income

e-Filing : Filing of Return of Income, Self-Assessment

**Suggested Reading :** As per suggested by Department of EAFM, University of Rajasthan, Jaipur.

**Learning Outcomes**

The Learning outcomes of this Course are as follows:

- Develop proficiency for personal and family financial planning
- Apply the concept of investment planning
- Ability to analyse the banking and insurance products
- Personal Tax Planning

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NEP-2020 based Syllabus

For

Value Added Courses for Semester I and II in UG Programmes

( 2 credits/ semester for Semester I, II. )

VAC-10

1.	Title of course-	NCC -2 (Semester -II)	
2	Nodal Department of HEI to run course	Dept of NCC (NCC Incharge)	
3	Broad Area/Sector-	University	
4	Sub Sector-	College	
5	Nature of course-Independent/Progressive	Progressive	
	Requisite	Qualified in NCC-I(Semester-I)	
8	Number of Seats-	As per Vacancies allotted by DG NCC	
9	Course Code- 04	Credits-02(1 Theory&2 Practical Hours per week)	
10	Scheme of Examination Max Marks... Minimum Marks:	As per SNCCO Sept 2022 (Annexure-4) 50 20	
11	Is this course is based on Outside Partners/Institutions/Industry/ Govt. Org. etc.	Yes	No
12	If Yes, Name of proposed Outside Partners/Institutions/Industry/ Govt. Org. etc.		
13	<p><b>Objective of NCC</b></p> <p>The National Cadet Corps (NCC) is one of the largest youth organizations in India, with a primary objective of developing character, discipline, and leadership qualities among the youth. Established in 1948, the NCC has played a significant role in shaping the future generations of the country. Its core values, such as unity, discipline, and secularism, contribute to fostering national integration and a sense of pride among the cadets.</p> <ul style="list-style-type: none"> <li>• The NCC operates under the Ministry of Defense and has a presence in various educational institutions, including schools and colleges. It provides young boys and girls with a platform to develop their personality, physical fitness, and social awareness. The NCC motto, "Unity and Discipline," encapsulates its fundamental principles and the goals it strives to achieve.</li> <li>• One of the primary objectives of the NCC is to develop leadership qualities among the cadets. Through various training activities, including drill exercises, obstacle courses, and team-building exercises, the NCC instills in its cadets the ability to lead and inspire others. Cadets are taught to make quick decisions, take responsibility, and work in teams. These leadership skills are not only beneficial during the NCC training but also in all aspects of life, be it academics, career, or personal relationships.</li> <li>• Another crucial objective of the NCC is to foster national integration. India is a diverse nation, with numerous languages, religions, and cultures. The NCC embraces this diversity and promotes a sense of unity among its cadets. Regardless of their background, religion, or region, cadets come together under the common goal of serving the nation. The NCC emphasizes the importance of unity in diversity and encourages cadets to respect and appreciate different cultures and traditions.</li> <li>• The NCC also aims to create responsible and disciplined citizens. Cadets are required to adhere to a strict code of conduct, which includes punctuality, respect for authority, and ethical behavior. These principles help in molding the character of the cadets and preparing them for the challenges of life. The NCC believes that disciplined individuals contribute positively to society and uphold the values of integrity and honesty.</li> <li>• Moreover, the NCC plays a vital role in providing cadets with opportunities to engage in social service activities. The organization encourages cadets to actively participate in community development projects, blood donation drives, and environmental conservation initiatives. These activities not only develop a sense of empathy and social responsibility but also nurture a spirit of selflessness and service towards the nation.</li> </ul>		

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... aim to create a pool of talented and responsible youth who can contribute to the defense services of the country. Many NCC cadets choose to pursue a career in the armed forces or other uniformed services, where they can utilize their skills and training to serve the nation. The NCC provides a strong foundation for such individuals, preparing them physically, mentally, and emotionally for the challenges of these professions.

<b>14</b>	<p><b>Syllabus Semester -II</b>  <b>Total Hours- 15 (Credits-01)</b>  <b>Practical- 30 Hours (Credits-01)</b></p> <p>Personality Development : Communication Skills, Group Discussion-Coping with Stress and Emotions          Leadership: Leadership Capsule; Traits, Indicators, Motivation, Moral Values. Honour Code; Case Studies Shivaji, Jhansi Ki Rani          Social Service and Community Development: Protection of Children &amp; Women Safety, Road/Rail Travel Safety, New Initiatives, Cyber and Mobile Security Awareness</p>
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**Unit wise Details of the Value Added Course ( NCC-2)**

Unit	Title of Unit	Course Content	Theory Hours	Practical Hours
I	Personality Development	Communication Skills Group Discussion-Coping with Stress and Emotions	3 2	30
II	Leadership	Leadership Capsule; Traits, Indicators, Motivation, Moral Values. Honour Code; Case Studies Shivaji, Jhansi Ki Rani	3 2	
III	Social Service and	Protection of Children & Women Safety	1	
IV	Community Development	Road/Rail Travel Safety New Initiatives Cyber and Mobile Security Awareness	1 2 1	
Total Hours			15	30

**Suggested Books/References/Web-links(if available)**

**Books:**

1. NCC Hand Book
2. Pamela Martinez, Critical Thinking: Decision Making, Problem Solving and Self Development (Effective Strategies That Will Make You Improve Critical Thinking)
3. Carl Patterson, Critical Thinking Skills: Practical Tools for Rational Thinking and Deep Analysis to Boost Your Brainpower. Adopt Logic Strategies to Find Intelligent and Effective Solutions to Challenges
4. P. Gopinadhan Pillai, Rural Development in India

**Web-Links:**

1. <https://indiancc.nic.in>
2. [https://www.researchgate.net/publication/357839324\\_NATIONAL\\_INTEGRATION\\_OF\\_INDIA\\_AND\\_THE\\_OBSTACLES\\_IN\\_ITS\\_WAY\\_STATE\\_RESPONSE\\_AND\\_ITS\\_REMEDIES](https://www.researchgate.net/publication/357839324_NATIONAL_INTEGRATION_OF_INDIA_AND_THE_OBSTACLES_IN_ITS_WAY_STATE_RESPONSE_AND_ITS_REMEDIES)
3. <https://www.vedantu.com/english/importance-of-national-integration-essay>

**Programme Specific Outcome**

Programme Specific Outcomes (PSOs) are statements that describe what students are expected to know and be able to do by the time they complete a specific program or course of study. In the case of the National Cadet Corps (NCC), the PSOs focus on the unique learning outcomes that cadets should achieve through their participation in the NCC program.

The NCC is a youth organization in many countries, including India, designed to develop character, discipline, and leadership skills among young people. It aims to create a pool of disciplined and motivated youth who can serve as future leaders in various fields. The PSOs of NCC encompass a wide range of skills and qualities that cadets are

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1. **Leadership Skills:** One of the primary PSOs of NCC is to develop leadership skills among cadets. Through various training activities, including leadership camps, command tasks, and practical exercises, cadets learn to lead and motivate their peers. They develop qualities like decision-making, effective communication, teamwork, and problem-solving skills, which are essential for effective leadership.
2. **Discipline and Time Management:** NCC instils a sense of discipline and time management in cadets. They learn to follow rules and regulations, maintain punctuality, and develop a strong work ethic. Cadets are taught to manage their time effectively to balance their academic commitments and NCC activities, which helps them become more organized and efficient individuals.
3. **Physical Fitness:** Physical fitness is an important aspect of NCC training. Cadets engage in regular physical activities, including drill exercises, sports, and adventure activities, to enhance their fitness levels. The PSO focuses on improving their endurance, strength, agility, and overall physical well-being.
4. **Social Awareness and Responsibility:** NCC promotes social awareness and a sense of responsibility towards the community and the nation. Cadets are exposed to various social issues and are encouraged to actively participate in social service activities such as cleanliness drives, blood donation camps, and awareness campaigns. They develop empathy, compassion, and a sense of civic duty.
5. **National Integration and Cultural Understanding:** NCC fosters national integration and cultural understanding among cadets. It brings together young people from diverse backgrounds and provides a platform for them to interact and appreciate different cultures, languages, and traditions. Cadets learn to respect and value the rich cultural heritage of their country and develop a sense of unity and brotherhood.
6. **Self-Confidence and Self-Development:** NCC aims to boost the self-confidence and overall personality development of cadets. Through various activities like public speaking, personality development sessions, and exposure to challenging situations, cadets learn to overcome their fears and develop a positive self-image. They gain confidence in their abilities and become more self-assured individuals.
7. **Crisis Management and Disaster Preparedness:** NCC equips cadets with the skills and knowledge necessary to respond effectively in crisis situations and natural disasters. They receive training in first aid, disaster management, and rescue operations. Cadets learn to remain calm under pressure, make quick decisions, and provide assistance to those in need.
8. **Ethics and Values:** NCC emphasizes the importance of ethics, values, and integrity. Cadets are encouraged to uphold moral and ethical principles in all aspects of life. They learn to distinguish between right and wrong, and develop a strong sense of integrity, honesty, and accountability.
9. **Teamwork and Interpersonal Skills:** NCC focuses on developing teamwork and interpersonal skills among cadets. They learn to work collaboratively in a team, respect diversity, and effectively communicate with others. Cadets understand the significance of cooperation and coordination in achieving common goals.
10. **Environmental Awareness and Conservation:** NCC promotes environmental awareness and conservation among cadets. They learn about environmental issues, sustainable

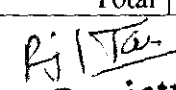
#### Annexure-4

#### Examination Scheme (Programme Evaluation Methods)

Sr. No.	Parameters	Max Marks
5.	Entries in Daily Diary	05
6.	Synopsis Project - NCC General	10
7.	Participation in NCC training	10
8.	Participation in Social Service and Community Development (SSCD)	25*
Total		50

#### \*Evaluation of SSCD:

Sr. No.	Parameters	Max Marks
4.	Presentation/Video/Photographs submitted with report	05
5.	Day Significance	10
6.	Participation in Puneet Sagar, Swachh Bharat, quiz, Social Awareness and Jagrukata Rally etc.	10
Total		25

  
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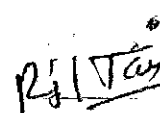
University of Rajasthan  
National Education Policy 2020 based syllabus

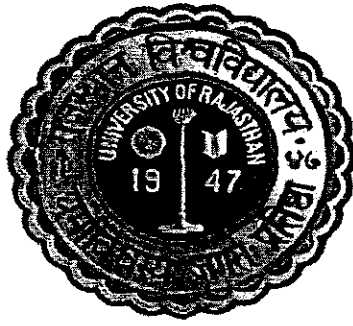
For  
Value added courses for Semester-I and II in UG Programmes  
(2 Credits/ semester for I, II semester)

VAC-11

1.	Title of Courses	National Service Scheme (NSS)-2
2.	Nodal Department of HEI to run course	NSS Coordinator of University
3.	Nature of Course- Independent/Progressive	-
4.	No. of seats	100 students in each NSS unit
5.	Course Code.....	2 Credits ( 60 Hours per semester per Unit
6.	Scheme of Examination Maximum marks Minimum marks	Annexure-5 (Attached) 50 20
7.	In the course is based on outside partners/ Institutions/ Industries/ Govt. organization etc.	Yes / No
8.	If yes, Name of proposed outside partners/ Institutions/ Industries/ Govt. organization etc.	Regional Directorate, National Service Scheme Jaipur, Rajasthan
9.	<p><b>National Service Scheme (NSS)</b> The National Service Scheme (NSS) is an Indian government sector public service program conducted by the Ministry of Youth Affairs [1] and Sports of the Government of India. Popularly known as NSS, the scheme was launched in Gandhiji's Centenary year in 1969. Aimed at developing student's personality through community service, NSS is a voluntary association of young people in Colleges, Universities and at +2 level working for a campus-community (esp. Villages) linkage.</p> <p><b>Objectives of NSS:</b></p> <p><i>The main objectives of National Service Scheme (NSS) are</i></p> <ul style="list-style-type: none"> <li>• understand the community in which they work</li> <li>• understand themselves in relation to their community</li> <li>• identify the needs and problems of the community and involve them in problem-solving</li> <li>• develop among themselves a sense of social and civic responsibility</li> <li>• utilise their knowledge in finding practical solutions to individual and community problems</li> <li>• develop competence required for group-living and sharing of responsibilities</li> <li>• gain skills in mobilizing community participation</li> <li>• acquire leadership qualities and democratic attitudes</li> <li>• develop capacity to meet emergencies and natural disasters and</li> <li>• practise national integration and social harmony</li> </ul>	
10	<p><b>Syllabus Guidelines:</b> <b>Theory Weight -15</b> <b>Practical/Project work – 30 hours + 15 hours (Any one project work, Field Visits/ Trainings)</b></p> <p><b>Unit-1: Importance and role of youth leadership in society (3)</b></p> <ol style="list-style-type: none"> <li>a) Volunteerism and Leadership</li> <li>b) Gender and Society</li> <li>c) Fundamental Rights</li> <li>d) Consumer Rights</li> </ol> <p><b>Unit-2: Awareness Camps (5)</b></p> <ol style="list-style-type: none"> <li>a) First Aid Training</li> <li>b) Traffic Awareness Programme</li> <li>c) Self Defense</li> <li>d) Environment Protection</li> </ol> <p><b>Unit-3: Social Harmony and Health (4)</b></p> <ol style="list-style-type: none"> <li>a) Indian History and Culture</li> <li>b) Role of Youth in National Building</li> <li>c) Group Discussion</li> <li>d) Health, Hygiene and diseases</li> </ol>	

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# **University of Rajasthan Jaipur**

**Syllabus of Skill Enhancement Courses**

**As per UGC Curriculum and CBCS**

**Framework for Undergraduate Programmes**

**Under NEP- 2020**

**For**

**Three/Four Year Under Graduate Programme in**

**(Semester – I to VI)**

**In**

**Faculty of Arts/Science/Commerce/Social  
Science/ Fine Arts**

**w.e.f. Academic Session - 2023-24**

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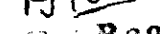
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## SKILL ENHANCEMENT COURSES

The introduction of Skill Enhancement courses into the Undergraduate Curriculum under the National Education Policy (NEP) 2020 signifies a significant leap forward in providing students with a holistic and practical education. These courses play a crucial role in equipping students with both technical and professional skills, empowering them to excel and adapt in the dynamic job market. The University of Rajasthan has taken proactive steps in offering a diverse range of Skill Enhancement courses, encompassing domains such as Computer Science, communication, digital literacy, entrepreneurship, and leadership, among others. This invaluable exposure not only aids students in making well-informed career decisions but also substantially enhances their employability prospects. Embracing these skill-oriented courses, the NEP-2020 envisions cultivating a generation of capable and job-ready professionals, fostering a brighter and more promising future for the young graduates.


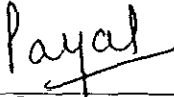

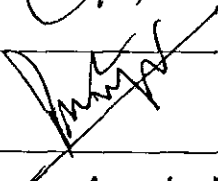
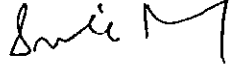
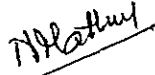


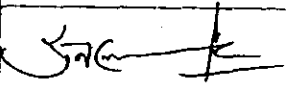



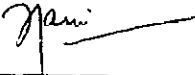


Students enrolled in any undergraduate program at the University and/or its affiliated/constituent colleges are provided with a diverse selection of skill enhancement courses during the **First and Second Semesters**. This pool of courses offers students the opportunity to choose from a variety of options to enrich their skills and knowledge. Students can tailor their learning experiences by selecting courses that align with their interests and career aspirations, ensuring a well-rounded education and enhanced employability prospects. The list of such courses is as follows –

S. No.	Course Code-Course Title	Is offered to NC Students	Total Credit	Delivery Type of the Course
1.	SEC-001-Computer Fundamentals	Yes	2	T
2.	SEC-002-Introduction to Office Productivity Software	No	2	P
3.	SEC-003-Data Analysis Using Excel	No	2	P
4.	SEC-004-Business Communication Skills	Yes	2	T
5.	SEC-005-Effective Communication Skills	No	2	T+P
6.	SEC-006-Learning Life Skills	No	2	T+P
7.	SEC-007-Logical and Critical Thinking	Yes	2	T
8.	SEC-008-Quantitative Aptitude and Data Interpretation	Yes	2	T
9.	SEC-009-Finance for Everyone	Yes	2	T
10.	SEC-010- Basics of Tourism Concepts	Yes	2	T
11.	SEC-011-Data Literacy	Yes	2	T
12.	SEC-012-Bio-Fertilizer	No	2	T+P
13.	SEC-013-Nursery and Gardening Techniques	No	2	T+P
14.	SEC-014- अकृमद कौशल	Yes	2	T
15.	SEC-015-प्रमाचो हिन्दो लखन	Yes	2	T
16.	SEC-016-Pest Management and Control	No	2	T+P
17.	SEC-017-Vermicomposting	No	2	T+P
18.	SEC-018- Understanding Union Budget and Economic Survey	Yes	2	T
19.	SEC-019- Survey Methodology	Yes	2	T

  
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Adhoc Committee Member and Domain Expert for Skill Enhancement Courses

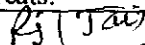

S. No.	Name		Signature
1.	Prof. Shailendra Kumar Gupta Department of Physics	Convenor	
2.	Prof. Payal Lodha Department of Botany	Member	
3.	Prof. Naresh Kumar Department of EAFM	Member	
4.	Prof. Paresh Vyas Department of Mathematics	Member	
5.	Prof. Sunita Agarwal Department of English	Member	
6.	Prof. Nupur Mathur Department of Zoology	Member	
7.	Prof. Sushila Pareek Department of Psychology	Member	
8.	Prof. Bhawani Shankar Sharma Department of Buss. Adm.	Member	
9.	Dr R. K. Gunsariya Department of Chemistry	Member	
10.	Dr Nikki Chaturvedi Department of History	Member	
11.	Dr Jitendra Singh Department of Hindi	Member	
12.	Prof. Pankaj Nagar Department of Statistics	Special Invitee	
13.	Prof. Rashmi Jain Department of Sociology	Special Invitee	
14.	Prof. Urvashi Sharma Department of Hindi	Special Invitee	
15.	Prof. Rameshwar Jat Department of Economics	Special Invitee	

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## Syllabus

### SEC-001 – Computer Fundamentals

Semester	Code of the Course	Title of the Course/Paper		NHEQF Level	Credits
I/II	SEC-001	Computer Fundamentals		5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course
		Theory	Practical		
Introductory	Skill Enhancement	2	-	Yes	30 Hours Theory
Prerequisites	XII Pass				
<b>Objectives of the Course:</b>	<p><b>Objectives of the Course –</b></p> <ol style="list-style-type: none"> <li>1. To provide students with a comprehensive understanding of Information Technology and its evolution, including the different generations of computers and types of computer systems.</li> <li>2. To familiarize students with the architecture of a computer system, encompassing the CPU, ALU, memory, input/output devices, and hardware-software interactions.</li> <li>3. To introduce students to various operating systems, such as UNIX, Linux, Windows, and their types, enabling them to comprehend the significance of operating systems in computing.</li> <li>4. To acquaint students with different programming languages, including low-level and high-level languages, procedural programming, object-oriented programming, functional programming, scripting languages, and their respective applications.</li> <li>5. To enable students to utilize the Internet effectively, including web browsing, understanding domain names and URLs, utilizing email services, participating in online communication, and exploring e-commerce and m-commerce platforms.</li> <li>6. To educate students about social, legal, and ethical aspects of information technology, raising awareness about cyber threats, cybercrime prevention, and the importance of data security.</li> <li>7. To provide insights into various cyber threats and attacks, such as computer viruses, malware, identity theft, phishing, and SQL injection, and to equip students with preventive measures against such threats.</li> </ol>				

  
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## Examination Scheme-

### Regular Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-001 –Computer Fundamentals	1 Hrs-MT 1 Hrs-EoSE	10 Marks-MT 40 Marks-EoSE	4 Marks-MT 16 Marks-EoSE

Question paper for Computer Fundamentals will be so set that it has 40 multiple choice questions (Bilingual) of one mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

### Non-Collegiate Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (EoSE)	Minimum Marks (EoSE)
Theory	SEC-001 –Computer Fundamentals	1 Hrs	50 Marks	20 Marks

Question paper for Computer Fundamentals will be so set that it has 50 multiple choice questions (Bilingual) of one mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

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*Das*

## Detailed Syllabus

### SEC-001- Computer Fundamentals

#### Unit – I

**Introduction to Information Technology:** Evolution and generation of computers, Type of computers. Micro, mini, mainframe and Super computer. Architecture of a computer system: CPU, ALU, Memory (RAM, ROM families, Cache Memory, Input/Output Devices, Pointing Devices, Hardware and Software

**Operating System and Programming Languages:** Concept of Operating System, Need, Types of Operating Systems, Batch, Single User, Multi-Processing, Distributed and Timeshared operating systems, Introduction to UNIX, Linux, Windows, Window NT, Virtual Machine, Programming Languages, Low Level and High Level, Generation of Languages, 3 GL and 4 GL languages, Procedural Programming Languages, Object Oriented Programming languages, Functional Programming Languages, Scripting Languages, Logic Programming Languages, Command Line Interface and Graphical User Interface

(8 Lectures)

#### Unit -II

**The Internet:** History and Functions of the Internet, Working with Internet, Web Browsers, World Wide Web, Uniform Resource Locator and Domain Names, Uses of Internet, Search for Information, Email, Chatting, Instant Messenger Services, News Group, Teleconferencing, Video Conferencing, E-Commerce and M-Commerce, E-services -Online Banking, Online Payment Modes, Mobile Wallets, Social Networking Sites, E-Learning/ Online Educations, Cloud-Based Storage, Digital Signature

Manage an E-Mail Account, E-Mail Address, Configure E-Mail Account, Login to an Email, Receive Email, Sending Email, Sending Files as Attachments, Adress Book, Downloading files

(8 Lectures)

#### Unit -III

**Social, Legal, Ethical Matters and Network Security:** Types of Cyber Threats, how to identify Safe Websites/ Portals, Secure Seals (Verisign/Trust pay etc.), Secure Browsing Habits and Mailing Etiquettes, Social, Legal and ethical aspect of IT, Effects on the way we work Socialise, Operational Areas, Cyber Crime, Prevention of Cyber Crime, Cyber Law, Indian IT Act, Intellectual Property Right, Software Piracy, Copy right and Patent, Software Licencing, Proprietary Software, Free and Open-Source Software, GPL Licence,

(7 Lectures)

#### Unit-IV

**Cyber Security Threats:** Security Threats and Attacks (Passive, Active). Types and Effects. Computer Virus, Malware, Adware, Ransomware, Spyware, Emotet , Identity Theft, Denial of Service, Man in Middle, Phishing, MySQL/SQL Injection, Password Attacks

**Network Security:** Risk Assessment and Security Measures, Assets and Type (Data, Applications System and Network). Security issues and Security Measure (Firewall, Encryption/Decryption), Prevention

*Raj Jay*

(7 Lectures)

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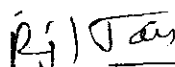
## Suggested Books and References –

1. Introduction to Computers by Peter Norton, McGraw-Hill Education
2. Computer Fundamentals by P.K. Sinha and Priti Sinha
3. Fundamental of Computers, Anita Goel
4. Fundamental of Computers, V. Rajaraman
5. Computer Fundamentals and Programming in C, Reema Thereja
6. Computers: Understanding Technology by Floyd Fuller and Brian Larson
7. Computer Science: An Overview by J. Glenn Brookshear
8. Discovering Computers by Misty E. Vermaat, Susan L. Sebok, Steven M. Freund, and Jennifer T. Campbell.
9. Computers Are Your Future by Catherine Laberta
10. The Elements of Computing Systems: Building a Modern Computer from First Principles by Noam Nisan and Shimon Schocken
11. How Computers Work by Ron White and Timothy Edward Downs
12. The Complete Idiot's Guide to the Internet by Peter Kent and Joe Kraynak
13. Cybersecurity for Beginners by Raef Meeuwisse.
14. Cybersecurity: The Beginner's Guide by Dr. Erdal Ozkaya and Hispasec Sistemas

## Course Learning Outcomes:

By the end of the course, students should be able to:

1. Students will gain a strong foundational knowledge of Information Technology and the historical progression of computers, leading to a broader perspective on technological advancements.
2. Students will be able to comprehend the architecture of a computer system, including the roles of CPU, ALU, memory, and input/output devices, fostering a deeper understanding of hardware-software interactions.
3. Students will acquire knowledge of different operating systems and programming languages, allowing them to make informed decisions while selecting appropriate tools for various applications.
4. Students will develop proficiency in using the Internet for research, communication, and e-commerce purposes, enhancing their digital literacy skills.
5. Students will understand the importance of social, legal, and ethical aspects of IT and be able to make responsible and secure choices while using technology.
6. Students will be able to identify potential cyber threats and adopt preventive measures to safeguard personal and organizational data from cyber-attacks.
7. By the end of the course, students will be equipped with essential skills and knowledge to navigate the digital world safely, making them more confident and informed users of technology.

  
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## Syllabus

### SEC-002 – Introduction to Office Productivity Software

Semester	Code of the Course	Title of the Course/Paper		NHEQF Level	Credits
I/II	SEC-002	Introduction to Office Productivity Software		5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course
		Theory	Practical		
Introductory	Skill Enhancement	-	2	NO	60 Hours Practical
Prerequisites	XII Pass				
Objectives of the Course:	Objectives of the Course – The objective of this course is to provide participants with a comprehensive understanding of the fundamental features and functionalities of word processing tools, electronic spreadsheets, and presentation software. Through hands-on practice and theoretical knowledge, participants will develop the skills necessary to efficiently create, format, and manage documents, spreadsheets, and presentations. By the end of the course, participants will be able to use these tools effectively to enhance their productivity in various professional and personal scenarios.				

### Examination Scheme-

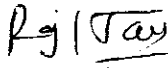
#### Regular Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Practical	SEC-002- Introduction to Office Productivity Software	1 Hrs-MT 1 Hrs-EoSE	10 Marks-MT 40 Marks-EoSE	4 Marks-MT 16 Marks-EoSE

The Practical examination Scheme for Introduction to Office Productivity Software should be as follows –

- Three Practical Exercise of 10 Marks each from each Unit – 30 Marks
- Viva-Voce – 10 Marks
- Record – 10 Marks

Duration of Practical Examination will be of 1 Hours.

  
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## Detailed Syllabus

### SEC-002 – Introduction to Office Productivity Software

#### Unit – I

##### Word Processing Tools:

**Text Basics:** Typing the text, Alignment of text, Editing Text: Cut, Copy, Paste, Select All, Clear, Find & Replace. **Text Formatting and saving file:** New, Open, Close, Save, Save As, Formatting Text: Font Size, Font Style, Font Colour, Use the Bold, Italic, and Underline, Change the Text Case, Line spacing, Paragraph spacing, Shading text and paragraph. Working with Tabs and Indents, **Objects:** Shapes, Clipart and Picture, Word Art, Smart Art, Columns and Orderings - To Add Columns to a Document, Change the Order of Objects, Page Number, Date & Time, Inserting Text boxes, Inserting Word art, inserting symbols, Inserting Chart, **Header & Footers:** Inserting custom Header and Footer, inserting objects in the header and footer, add section break to a document **Bullets and numbered lists:** Multilevel numbering and Bulleting, Creating List, Customizing List style, Page bordering, Page background, **Tables:** Working with Tables, Table Formatting, Table Styles, Alignment option, Merge and split option, **Styles and Content:** Using Build- in Styles, Modifying Styles, Creating Styles, Creating a list style, Table of contents and references, Adding internal references, Adding a Footnote, Adding Endnote **Merging Documents:** Typing new address list, Importing address list from Excel file, Write and insert field, Merging with outlook contact, Preview Result, Merging to envelopes, Merging to label, Setting rules for merges, Finish & Merge options **Sharing and Maintaining Document:** Changing Word Options, Changing the Proofing Tools, Managing Templates, Restricting Document Access, Using Protected View, Working with Templates, Managing Templates, Understanding building blocks **Proofing the document:** Check Spelling As You Type, Mark Grammar Errors As You Type, Setting AutoCorrect Options **Printing:** Page Setup, setting margins, Print Preview, Print

(20 Hours Practical)

#### Unit -II

##### Electronic Spreadsheet:

**Introduction to spreadsheet:** Introduction, Understanding rows and columns, Naming Cells, Working with excel workbook and sheets, **Formatting excel work book::** New, Open, Close, Save, Save As, Formatting Text: Font Size, Font Style, Font Color, Use the Bold, Italic, and Underline, Wrap text, Merge and Centre, Currency, Accounting and other formats, Modifying Columns, Rows & Cells, **Perform Calculations with Functions:** Creating Simple Formulas, Setting up your own formula, Date and Time Functions, Financial Functions, Logical Functions, Lookup and Reference, Functions Mathematical Functions, Statistical Functions, Text Functions, **Sort and Filter Data:** Sort and filtering data, Using number filter, Text filter, Custom filtering, Removing filters from columns, Conditional formatting, **Create Charts:** Create an effective chart with Chart Tool, Design, Format, and Layout options, Adding chart title, Changing layouts, Chart styles, Editing chart data range, Editing data series, Changing chart, **PivotTables and Pivot Charts:** Understand PivotTables, Create a PivotTable, Framework Using the PivotTable and PivotChart, Create Pivot Chart from pivot Table, Inserting slicer, Creating Calculated fields **Protecting and Sharing the work book:** Protecting a workbook with a password, Allow user to edit ranges, Track changes, Working with Comments, Insert Excel Objects and Charts in Word Document and Power point Presentation. **Use Macros to Automate Tasks:** Creating and Recording Macros, Assigning Macros to the work sheets, Saving Macro enabled workbook **Proofing and Printing:** Page setup, setting print area, print titles, inserting custom Header and Footer, inserting objects in the header and footer, Page Setup, setting margins, Print Preview, Print, enable back ground error checking, Setting Auto Correct Options

(20 Hours Practical)

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## Unit -III

### POWERPOINT:

**Setting Up PowerPoint Environment:** New, Open, Close, Save, Save As, Typing the text, Alignment of text, Formatting Text: Font Size, Font Style, Font Color, Use the Bold, Italic, and Underline, Cut, Copy, Paste, Select All, Clear text, Find & Replace, Working with Tabs and Indents, **Creating slides and applying themes:** Inserting new slide, Changing layout of slides, Duplicating slides, Copying and pasting slide, Applying themes to the slide layout, Changing theme color, Slide background, Formatting slide background, Using slide views, **Working with bullets and numbering:** Multilevel numbering and Bulleting, Creating List, Page bordering, Page background, Aligning text, Text directions, Columns option **Working with Objects:** Shapes, Clipart and Picture, Word Art, Smart Art, Change the Order of Objects, Inserting slide header and footer, Inserting Text boxes, Inserting shapes, using quick styles, Inserting Word art, Inserting symbols, Inserting Chart, **Hyperlinks and Action Buttons:** Inserting Hyperlinks and Action Buttons, Edit Hyperlinks and Action Button, Word Art and Shapes **Working With Movies and Sounds:** Inserting Movie From a Computer File, Inserting Audio file, Audio Video playback and format options, Video options, Adjust options, Reshaping and bordering Video, **Using SmartArt and Tables:** Working with Tables, Table Formatting, Table Styles, Alignment option, Merge and split option, Converting text to smart art, **Animation and Slide Transition:** Default Animation, Custom Animation, Modify a Default or Custom Animation, Reorder Animation Using Transitions, Apply a Slide Transition, Modifying, Transition, Advancing to the Next Slide, **Using slide Master:** Using slide master, Inserting layout option, Creating custom layout, Inserting place holders, Formatting place holders, **Slide show option:** Start slide show, Start show from the current slide, Rehearse timing, creating custom slide show, **Proofing and Printing:** Check Spelling As You Type, Setting AutoCorrect Options, Save as video, Save as JPEG files, Save as PowerPoint Show file, Print Preview, Print

(20 Hours Practical)

### Suggested Books and References –

1. Microsoft Office for Beginners by M.L. Humphrey
2. Microsoft Word 2016 Step by Step by Joan Lambert and Curtis Frye
3. Excel 2016 Bible by John Walkenbach
4. PowerPoint 2016 For Dummies by Doug Lowe
5. Microsoft Office 2016 In Practice by Randy Nordell

### Course Learning Outcomes:

By the end of the course, students should be able to:

1. **Word Processing:**
  - Format documents using advanced text styling and alignment.
  - Manipulate text with cut, copy, paste, and find & replace functions.
  - Enhance document layout with headers, footers, and page numbering.
  - Create visually appealing content using tables, objects, and styles.
  - Efficiently merge documents and manage templates for streamlined work.
2. **Electronic Spreadsheet:**
  - Apply formatting and calculations using a variety of functions.
  - Organize and analyze data through sorting, filtering, and charts.
  - Automate tasks with macros and protect workbooks with passwords.
  - Create dynamic pivot tables for data visualization and analysis.
3. **PowerPoint:**
  - Design captivating presentations with themes, formatting, and multimedia.
  - Incorporate interactive elements like hyperlinks and action buttons.
  - Apply animations and transitions for engaging slide shows.
  - Customize master slides for consistent and polished presentations.



## Syllabus

### SEC-003 – Data Analysis Using Excel

Semester	Code of the Course	Title of the Course/Paper		NHEQF Level	Credits
I/II	SEC-003	Data Analysis Using Excel		5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course
		Theory	Practical		
Introductory	Skill Enhancement	-	2	No	60 Hours Practical
Prerequisites	XII Pass				
Objectives of the Course:	<b>Objectives of the Course –</b> <ol style="list-style-type: none"> <li>1. To Understand Data Analysis Fundamentals and Excel Basics:</li> <li>2. Understanding the process of cleaning and transforming data.</li> <li>3. Understanding Visualization of data.</li> <li>4. Understanding Inbuilt functions of MS-Excel and User defined functions</li> <li>5. To understand Statistical Tools for Data analysis.</li> <li>6. Apply Data Analysis to Real-world Scenarios.</li> </ol>				

### Examination Scheme-

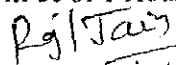
#### Regular Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Practical	Data Analysis Using Excel	1 Hrs-MT 1 Hrs-EoSE	10 Marks-MT 40 Marks-EoSE	4 Marks-MT 16 Marks-EoSE

The Practical examination Scheme for Introduction to Office Productivity Software should be as follows –

- Three Practical Exercise of 10 Marks each from each Unit – 30 Marks
- Viva-Voce – 10 Marks
- Record – 10 Marks

Duration of Practical Examination will be of 1 Hours.

  
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## Detailed Syllabus

### SEC-003 – Data Analysis Using Excel

Unit	Course Contents	No. of Lectures
Unit-I	<b>Introduction:</b> Introduction to data analysis concepts. Excel's interface and its features. Data entry, formatting, and basic calculations on work sheet. Introduction to Simple Excel functions (SUM, AVERAGE, COUNT, date formats etc.). Various form of storing an excel file. Managing worksheets and workbooks. Storing Workbooks.	16
Unit-II	<b>Data Cleaning and Transformation</b> Importing data from various sources (CSV, text, databases). Data cleaning techniques (removing duplicates, handling missing values). Text-to-columns and data splitting. Data validation and conditional formatting.	12
Unit-III	<b>Visualization:</b> Creating basic charts (bar, line, pie). Customizing charts (titles, labels, legends). Using advanced chart types (scatter plots, histograms). Adding trend lines and data labels. Creating dynamic charts with slicers. Probability Distributions and their graphical representation. Pivot Tables: Creating, modifying, and summarizing data. Pivot Charts: Visualizing Pivot Table data. Introduction to What-If Analysis	16
Unit-IV	<b>Data Analysis Tools:</b> Introduction to basic statistical functions (STDEV, MIN, MAX). Using Excel's built-in analysis tools (Correlation, Regression). Introduction to Power Query for data transformation. User Defined Formulae, Data Analysis Tool-Pack, Preparation of Correlation Matrix, Fitting multiple Regression equation. Generating Random Numbers, Statistical Inference tools : Application of Z-Test, t-test, F-tests, ANOVA- One way and Two-way.	16

#### Suggested Books and References –

1. Paul McFedries (2022): Excel Data Analysis For Dummies, 5th Edition, John Wiley & Sons, ISBN: 978-1-119-84442-6
2. K. Berk (Author), Partrick Carey (2003), Data Analysis with Microsoft Excel, Duxbury Press; New edition (25 March 2003), ISBN-13 : 978-0534407148
3. Robert de Levie(2003), Advanced Excel for Scientific Data Analysis, OUP USA (9 October 2003), ISBN-13 : 978-0195170894
4. Manisha Nigam(2019): Data Analysis with Excel, BPB Publications; First Edition (5 September 2019), ISBN-13 : 978-9388176675
5. L. Winston Wayne (2019): MICROSOFT EXCEL 2019: DATA ANALYSIS & BUSINESS MODEL, 6<sup>th</sup> Edn., PHI Learning Pvt. Ltd. (11 October 2019), ISBN-13 : 978-9389347180
6. Wayne Winston(2017), Microsoft Excel Data Analysis and Business Modeling, Microsoft Press; 5th edition, ISBN-13 : 978-1509304219

  
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**Suggested E-resources:**

**Online Lecture Notes and Course Materials:**

1. E-PG Pathshala:  
<https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=fBYckQKJvP3a/8Vd3L08tQ==>
2. **Lecture Notes:**
  1. <https://www.gacbe.ac.in/pdf/ematerial/18BCS5EL-U5.pdf>
  2. <https://drive.google.com/file/d/11yrwIjBoI2RRaBlj4Vy3XpZQhaM8D1dz/view?pli=1>
  3. <https://www.guru99.com/excel-tutorials.html>
  4. <https://gacbe.ac.in/pdf/ematerial/18MEC24C-U4.pdf>

**Course Learning Outcomes:**

**After completing this short-term course students will gain with**

1. Proficiency in Excel.
2. Data Analytical tools with Excel.
3. Data Visualization tools with MS-Excel:
4. Creating Pivot-Table Mastery.
5. Participants will have a solid foundation for further studies in data analysis, statistics, or related fields.
6. Successful completion of the course can enhance participants' career prospects by equipping them with sought-after data analysis skills.
7. Participants will be better equipped to solve real-world problems using data-driven insights and informed decision-making.
8. Students will realize confident navigating and utilizing Excel for various data analysis tasks.

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## Syllabus

### SEC-004 – Business Communication Skills

Semester	Code of the Course	Title of the Course/Paper		NHEQF Level	Credits
I/II	SEC-004	Business Communication Skills		5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course
		Theory	Practical		
Introductory	Skill Enhancement	2	-	Yes	30 Hours Lectures
Prerequisites	XII Pass				
Objectives of the Course:	Objectives of the Course – <ul style="list-style-type: none"> <li>• Acquire the essentials of business communication skills.</li> <li>• Acquire career skills and truly pursue to partake in a successful career path.</li> <li>• Teach them all types of business correspondences including electronic.</li> <li>• Prepare good resume, prepare for interviews and group discussions.</li> <li>• Explore desired career opportunities in the employment market in consideration of an individual SWOT.</li> </ul>				

### Examination Scheme-

#### Regular Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-004-Business Communication Skills	1 Hrs-MT 1 Hrs-EoSE	10 Marks-MT 40 Marks-EoSE	4 Marks-MT 16 Marks-EoSE

Question paper for Business Communication Skill will be so set that it has 40 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

#### Non-Collegiate Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (EoSE)	Minimum Marks (EoSE)
Theory	SEC-004-Business Communication Skills	1 Hrs	50 Marks	20 Marks

Question paper for Business Communication Skill will be so set that it has 50 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

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## Detailed Syllabus

### SEC-004 – Business Communication Skills

#### Unit 1. Introduction to the essentials of Business Communication

Meaning, Process and Functions  
Channels and Types of Communication  
Effective Communication and its Barriers  
Importance of Business Communication

(7 Lecture)

#### Unit 2: Business Correspondence

Advertisement  
Inviting Tender and Placing Order  
Notice, Circular, Memo, Minutes of Meeting  
Appreciation and Complaint Letters

(8 Lecture)

#### Unit 3. Oral Business Communication

Greeting and Telephonic Conversation  
PPT Making and Presentation Skills  
Interview  
Group Discussion

(8 Lecture)

#### Unit 4: Electronic Communication

Email Writing  
Virtual Business Meetings  
Use of Social-Media for Business Communication  
Internet Etiquettes and Correct use of Emoticons

(7 Lecture)

#### Suggested Books and References –

1. English Communication – A Textbook for AECC-2 (Cambridge), Somak Mandal/ Sharmishtha Chatterjee Sriwastav (Cambridge)
2. Interact – A Course in Communicative English, Malathy Krishnam/ Zinia Mitra/ Binayak Ray (Cambridge)
3. English Fluency – I, Pooja Khanna/ Neerja Deswal
4. Sen Madhucchanda (2010), An Introduction to Critical Thinking, Pearson, Delhi
5. Silvia P.J. (2007), How to Read a Lot, American Psychological Association, Washington DC

#### Suggested E-resources:

1. Online Lecture Notes and Course Materials:  
Online platform SWAYAM

#### Course Learning Outcomes:

By the end of the course, students should be able to:

1. By the end of this program participants should have a clear understanding of what good communication skills are and what they can do to improve their abilities.
2. Participate in a digital lifestyle conversant with computers, applications, Internet and nuances of cyber security.
3. Engage in effective communication by respecting diversity and embracing good listening skills.
4. Distinguish the guiding principles for communication in a diverse, smaller internal world.

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## Syllabus

### SEC-005 – Effective Communication Skills

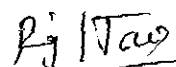
Semester	Code of the Course	Title of the Course/Paper		NHEQF Level	Credits
I/II	SEC-005	Effective Communication Skills		5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course
		Theory	Practical		
Introductory	Skill Enhancement	2	-	No	20 Lectures and 20 Hour Activity Based
Prerequisites	XII Pass				
Objectives of the Course:	<ul style="list-style-type: none"> <li>• Develop a deep understanding of key concepts</li> <li>• To acquire good LSRW</li> <li>• To Prepare them for course and employment</li> <li>• Understand the importance of empathetic listening</li> <li>• Master a subject or tool with hands-on projects</li> </ul>				

### Examination Scheme-

#### Regular Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
	SEC-004-Effective Communication Skills	1 Hrs-MT 1 Hrs-EoSE	10 Marks-MT 40 Marks-EoSE	4 Marks-MT 16 Marks-EoSE

Question paper for Effective Communication Skills will be so set that it has 40 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

  
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## Detailed Syllabus

### SEC-005 – Effective Communication Skills

#### Unit 1:

##### Communication Process

Meaning of Communication and its Components  
Types of Communication  
Barriers of Communication  
Activity based Learning

(8 Lectures)

#### Unit 2:

##### Non-Verbal Communication

Meaning of non-verbal communication  
Introduction to modes of non-verbal communication  
Do's and Don'ts  
Activity based Learning

(7 Lectures)

#### Unit 3:

##### Listening and Speaking Skills

Techniques of Effective Listening  
Listening and Comprehension  
Understanding English Sounds, Tone and Intonation  
Activity based Learning

(8 Lectures)

#### Unit 4:

##### Reading and Writing Skills

Techniques of Effective Reading  
Reading and Comprehension  
Common Errors  
Activity based Learning

(7 Lectures)

#### Suggested Books and References --

1. English Communication – A Textbook for AECC-2 (Cambridge), Somak Mandal/ Sharmishtha Chatterjee Sriwastav (Cambridge)
5. Interact – A Course in Communicative English, Malathy Krishnam/ Zinia Mitra/ Binayak Ray (Cambridge)
6. English Fluency – I, Pooja Khanna/ Neerja Deswal
7. Sen Madhucchanda (2010). An Introduction to Critical Thinking. Pearson, Delhi
8. Silvia P.J. (2007). How to Read a Lot, American Psychological Association, Washington DC

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**Suggested E-resources:**

1. **Online Lecture Notes and Course Materials:**  
Online platform SWAYAM

**Course Learning Outcomes:**

By the end of the course, students should be able to:

1. By the end of this program participants should have a clear understanding of what good communication skills are and what they can do to improve their abilities.
2. Participate in a digital lifestyle conversant with computers, applications, Internet and nuances of cyber security.
3. Engage in effective communication by respecting diversity and embracing good listening skills.
4. Distinguish the guiding principles for communication in a diverse, smaller internal world.

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## Syllabus

### SEC-006 – Learning Life Skills


Semester	Code of the Course	Title of the Course/Paper		NHEQF Level	Credits
I/II	SEC-006	Learning Life Skills		5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course
		Theory	Practical		
Introductory	Skill Enhancement	2	-	No	20 Lectures and 20 Hour Activity Based
Prerequisites	XII Pass				
Objectives of the Course:	Objectives of the Course – <ul style="list-style-type: none"> <li>• To help young students to better understand themselves</li> <li>• To get along well with others</li> <li>• To take responsible and mature decisions</li> <li>• To cope with life's inevitable challenges realistically and effectively</li> </ul>				

### Examination Scheme-

#### Regular Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-006-Learning Life Skills	1 Hrs-MT 1 Hrs-EoSE	10 Marks-MT 40 Marks-EoSE	4 Marks-MT 16 Marks-EoSE

Question paper for Learning Life Skills will be so set that it has 40 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

  
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## Detailed Syllabus

### SEC-006 – Learning Life Skills

#### Unit – I

Life Skills- Introduction, Need and Significance,  
Benefits and Methods of Life Skills Education

(8 Lectures)

#### Unit –II

Social Skills-Self Awareness, Empathy, Effective Communication,  
Interpersonal Relationship

(7 Lectures)

#### Unit –III

Thinking Skills- Creative Thinking, Critical Thinking,  
Decision Making, Problem Solving

(8 Lectures)

#### Unit-IV

Emotional Skills- Coping with Stress, Coping with Emotions

(7 Lectures)

#### Suggested Books and References –

1. Saravanakumar, A. R. (2020) Life Skill Education through Lifelong Learning. Maharashtra, India, Laxmi Book Publication.
2. Verma, S. (2014) Development of Life Skills and Professional Practice. Noida, India, Vikas Publishing House Pvt. Ltd.
3. UNICEF Comprehensive Life Skills Framework.
4. AIF Handbook of Activities on Life Skills (2018)

#### Suggested E-resources:

1. [www.AIF.org](http://www.AIF.org)
2. [www.unicef.org](http://www.unicef.org)
3. [www.who.org](http://www.who.org)

#### Course Learning Outcomes:

By the end of the course, students will be able to:

1. identify and share the interests, aspirations, strengths and weaknesses by enhancing self-awareness.
2. develop social and communication skills and learn to maintain healthy relationships.
3. analyse and evaluate situations, actions and thoughts rationally and creatively.
4. identify and manage and cope with stress and deal effectively with positive and negative emotions

## Syllabus

### SEC-007 – Logical and Critical Thinking

Semester	Code of the Course	Title of the Course/Paper		NHEQF Level	Credits
I/II	SEC-007	Logical and Critical Thinking		5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course
		Theory	Practical		
Introductory	Skill Enhancement	2	-	Yes	30 Hours Lecture
Prerequisites	XII Pass				
Objectives of the Course:	Objectives of the Course – This course aims to equip students with a comprehensive understanding of various logical reasoning concepts and critical thinking techniques. Through a diverse range of topics and exercises, the course seeks to enhance students' ability to analyze information, evaluate arguments, solve complex problems, and make informed decisions. By the end of the course, students should have a solid foundation in logical reasoning and critical thinking, empowering them to excel in various academic, professional, and everyday scenarios.				

### Examination Scheme-

#### Regular Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-007- Logical and Critical Thinking	1 Hrs-MT 1 Hrs-EoSE	10 Marks-MT 40 Marks-EoSE	4 Marks-MT 16 Marks-EoSE

Question paper for Logical and Critical Thinking will be so set that it has 40 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

#### Non-Collegiate Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (EoSE)	Minimum Marks (EoSE)
Theory	SEC-007- Logical and Critical Thinking	1 Hrs	50 Marks	20 Marks

Question paper for Logical and Critical Thinking will be so set that it has 50 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

## Detailed Syllabus

### SEC-007- Logical and Critical Thinking

#### Unit – I

Alphabet test, Alphanumeric series, Analogy, Analytical and Decision Making, Arithmetic Reasoning, Artificial Language,

(7 Lectures)

#### Unit – II

Blood Relations, Calendars, Cause and Effect, Classification, Clocks, Code Inequalities, Coded equations, Coding and Decoding, Course of Action, Critical path, Critical Reasoning, Cubes and cuboids,

(8 Lectures)

#### Unit – III

Data Sufficiency, Decision Making, Deductive Reasoning/Statement Analysis, Dices, Direction questions, Embedded Images, Figure Matrix, Input-Output, Mirror and Water Images, Odd One Out, Ordering and Ranking, Paper folding; unfolding questions

(8 Lectures)

#### Unit – IV

Picture Series and Sequences, Puzzles, Reasoning Analogies, Seating Arrangements, Shape Construction, Statement and Assumptions, Statement and Conclusions, Syllogism, Venn Diagram. Verbal Reasoning, Visual Reasoning

(7 Lectures)

#### Suggested Books and References –

1. A Modern Approach to Logical Reasoning by R.S. Aggarwal
2. Logical and Analytical Reasoning by A.K. Gupta
3. How to Prepare for Logical Reasoning for CAT by Arun Sharma
4. Verbal and Non-Verbal Reasoning by R.S. Aggarwal
5. Analytical Reasoning by M.K. Pandey
6. Logical Reasoning and Data Interpretation for CAT by Nishit K. Sinha
7. The PowerScore LSAT Logical Reasoning Bible by David M. Killoran
8. Critical Thinking: A Student's Introduction by Gregory Bassham, William Irwin, and Henry Nardone
9. Thinking, Fast and Slow by Daniel Kahneman
10. The Art of Thinking Clearly by Rolf Dobell

#### Course Learning Outcomes:

By the end of the course, students should be able to:

1. Demonstrate Proficiency in Various Logical Reasoning Techniques: Students will grasp the fundamental principles of logical reasoning and apply techniques such as analogy, classification, coding-decoding, statement analysis, syllogism, and more.
2. Enhance Critical Thinking Skills: Students will develop the ability to critically evaluate information, identify assumptions, and analyze argument to make well-reasoned decisions.

3. **Solve Complex Problems:** Students will be adept at solving intricate problems involving arithmetic reasoning, puzzles, sequencing, and other logical challenges.
4. **Interpret Visual and Verbal Data:** Students will effectively interpret visual information, such as figure matrices, and comprehend verbal reasoning exercises to arrive at accurate conclusions.
5. **Navigate Various Question Types:** Students will become proficient in handling a wide range of logical reasoning question formats, including seating arrangements, blood relations, calendars, and more.
6. **Strengthen Decision-Making Abilities:** Students will sharpen their decision-making skills by considering cause and effect relationships, identifying critical paths, and applying course of action principles.
7. **Enhance Test-Taking Abilities:** Students will be well-prepared for competitive exams and assessments that include logical reasoning sections, as they will have practiced a diverse set of reasoning challenges.
8. **Apply Logical Thinking in Real-Life Contexts:** Students will be able to apply logical and critical thinking techniques to real-life situations, improving their problem-solving abilities in various domains.

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## Syllabus

### SEC-008 – Quantitative Aptitude and Data Interpretation

Semester	Code of the Course	Title of the Course/Paper		NHEQF Level	Credits
I/II	SEC-008	Quantitative Aptitude and Data Interpretation		5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course
		Theory	Practical		
Introductory	Skill Enhancement	2	-	Yes	30 Hours Lecture
Prerequisites	XII Pass				
Objectives of the Course:	Objectives of the Course – <ul style="list-style-type: none"> <li>• To provide a strong foundation in the number system and basic arithmetic concepts.</li> <li>• To understand divisibility rules, decimal fractions, greatest common divisor (GCD), least common multiple (LCM), surds, indices, and simplifying square and cube roots.</li> <li>• To solve problems related to averages, ages, allegations, and percentages.</li> </ul>				

### Examination Scheme-

#### Regular Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-008- Quantitative Aptitude and Data Interpretation	1 Hrs-MT 1 Hrs-EoSE	10 Marks-MT 40 Marks-EoSE	4 Marks-MT 16 Marks-EoSE

Question paper for Quantitative Aptitude and Data Interpretation will be so set that it has 40 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

#### Non-Collegiate Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (EoSE)	Minimum Marks (EoSE)
Theory	SEC-008- Quantitative Aptitude and Data Interpretation	1 Hrs	50 Marks	20 Marks

Question paper for Quantitative Aptitude and Data Interpretation will be so set that it has 50 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

## Detailed Syllabus

### SEC-008 – Quantitative Aptitude and Data Interpretation

#### Unit – I

Number system, divisibility, decimal fractions, GCD & LCM, surds and indices, Squares and Cubes, square roots and cube roots, problems on averages and ages, allegations, percentage.

(08 Lectures)

#### Unit -II

Profit & loss, partnership, discount, simple & compound interest, ratio & proportion and variation.

(06 Lectures)

#### Unit -III

Time and work, time, speed and distance, geometry and mensuration, coordinate geometry, functions, inequalities, quadratic and other equations, logarithms, permutations and combinations, probability, set theory

(08 Lectures)

#### Unit-IV

Basic modes of data Interpretation, Data. Nature of Data, Data represents variable, types of variable need for capturing data. Data interpretation -definition, organization and presentation, Tabular presentation. Tables, bar Charts- Simple, Stacked, Composite, representation of percentage, show deviation, XY Charts, Pie Charts, Cases, Challenges of data interpretation, Data Sufficiency

(08 Lectures)

#### Suggested Books and References –

1. R.S. Aggarwal, Quantitative Aptitude for Competitive Examinations, S. Chand, 2018.
2. Arun Sharma, Teach Yourself Quantitative Aptitude, McGraw Hill, 2019.
3. P.A. Anand, Wiley Quantitative Aptitude For Competitive Exams, Wiley India Pvt.Ltd., 2015.
4. Rajesh Verma, Fast Track Objective Arithmetic, Arihant Publications, 2018.
5. Nishit K. Sinha - The Pearson Guide to Quantitative Aptitude and Data Interpretation for the CAT-Pearson Education (2012)

#### Course Learning Outcomes:

By the end of the course, students will be proficient in solving a range of mathematical problems, interpreting data, and making informed decisions in various contexts. They will have developed quantitative reasoning skills that can be applied both academically and in practical situations.

*P. J. Jay*  
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JAIPUR

## Syllabus

### SEC-009 – Finance for Everyone

Semester	Code of the Course	Title of the Course/Paper		NHEQF Level	Credits
I/II	SEC-009	Finance for Everyone		5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course
		Theory	Practical		
Introductory	Skill Enhancement	2	-	Yes	30 Hours Lecture
Prerequisites	XII Pass				
Objectives of the Course:	Objectives of the Course – The course "Finance for Everyone" aims to provide participants with a solid foundation in financial literacy and personal finance management. Through comprehensive lessons, it seeks to familiarize students with essential financial concepts, various financial institutions, investment strategies, taxation principles, and insurance planning. The course is designed to empower individuals with the knowledge and skills necessary to make informed financial decisions and effectively manage their personal finances.				

### Examination Scheme-

#### Regular Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-009- Finance for Everyone	1 Hrs-MT 1 Hrs-EoSE	10 Marks-MT 40 Marks-EoSE	4 Marks-MT 16 Marks-EoSE

Question paper for Finance for Everyone will be so set that it has 40 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

#### Non-Collegiate Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (EoSE)	Minimum Marks (EoSE)
Theory	SEC-009- Finance for Everyone	1 Hrs	50 Marks	20 Marks

Question paper for Finance for Everyone will be so set that it has 50 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

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## Detailed Syllabus

### SEC-009 – Finance for Everyone

#### Unit – I

- Lesson :1 – Introduction to Financial Literacy and Personal Finance
  - Lesson :2 – Brief about Financial Institution (Banks, NBFC's and Insurance Companies)
  - Lesson :3 – Financial Planning and Decisions
  - Lesson :4 – Introduction to Financial Forecasting and Budgeting
- (08 Lectures)**

#### Unit -II

- Lesson :1 – Introduction to Banking and Electronic Banking (Including Digital Payments)
  - Lesson :2 – Basic Concepts of Investment
  - Lesson :3 – Basics of Money Market
  - Lesson :4 – Brief about Capital Market and its types
- (08 Lectures)**

#### Unit -III

- Lesson :1 – Introduction to Insurance Planning
  - Lesson :2 – Various types of Insurance
  - Lesson :3 – Introduction to Indirect Tax (GST)
- (06 Lectures)**

#### Unit-IV

- Lesson :1 – Income Tax: An Introduction
  - Lesson :2 – Basic Concepts of Taxation (Including Residential Status and Heads of Income)
  - Lesson :3 – Personal Tax Planning and Reduction of Tax Liability
- (08 Lectures)**

#### Suggested Books and References –

1. Finance for everyone: Devinder Kumar Anand, Vikas Publishing House Pvt Ltd.
2. Basics of Finance and Banking: Bhattacharya & Agarwal. Himalya Publishing House.

#### Course Learning Outcomes:

By the end of the course, students should be able to:

1. Recognize the significance of financial literacy and its role in making informed financial decisions.
2. Understand the functions and roles of different financial institutions, including banks, NBFCs, and insurance companies.

3. Develop effective financial planning skills, set financial goals, and make prudent financial decisions.
4. Apply financial forecasting and budgeting techniques to manage expenses and achieve financial objectives.
5. Navigate electronic banking, including digital payments, and utilize online banking services effectively.
6. Grasp fundamental investment concepts, assess risk and return relationships, and explore different investment options.
7. Comprehend the basics of the money market and its importance in short-term financing.
8. Gain insight into the capital market and its primary and secondary segments, along with various traded securities.
9. Understand the significance of insurance planning, choose appropriate insurance products, and manage financial risks.
10. Identify different types of insurance, such as life, health, property, and liability insurance, and their respective benefits.
11. Gain a basic understanding of the Goods and Services Tax (GST) and its implications.
12. Familiarize themselves with income tax, its fundamental concepts, residential status determination, and various sources of income.
13. Employ personal tax planning strategies, optimize tax liabilities, and explore tax-saving investment options

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## Syllabus

### SEC-010 – Basics of Tourism Concepts

Semester	Code of the Course	Title of the Course/Paper		NHEQF Level	Credits
I/II	SEC-010	Basics of Tourism Concepts		5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course
		Theory	Practical		
Introductory	Skill Enhancement	2	-	Yes	30 Hours Lecture
Prerequisites	XII Pass				
Objectives of the Course:	Objectives of the Course – <ol style="list-style-type: none"> <li>1. Introduce students to the core concepts of tourism, including its historical development, types, forms, and components.</li> <li>2. Provide insights into the characteristics and patterns of growth in domestic and international tourism.</li> <li>3. Develop an understanding of the motivations driving tourism demand and the factors influencing individuals' choices to travel.</li> <li>4. Explore the wide-ranging impacts of tourism, including economic, socio-cultural, and environmental effects, both positive and negative.</li> </ol>				

### Examination Scheme-

#### Regular Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-010- Basics of Tourism Concepts	1 Hrs-MT 1 Hrs-EoSE	10 Marks-MT 40 Marks-EoSE	4 Marks-MT 16 Marks-EoSE

Question paper for Basics of Tourism Concepts will be so set that it has 40 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

#### Non-Collegiate Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (EoSE)	Minimum Marks (EoSE)
Theory	SEC-010- Basics of Tourism Concepts	1 Hrs	50 Marks	20 Marks

Question paper for Basics of Tourism Concepts will be so set that it has 50 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

## Detailed Syllabus

### SEC-010 – Basics of Tourism Concepts

#### Unit I

**Tourism Concepts:** Definitions and historical development of tourism, Types of tourist-Visitor-Excursionists, Types and Forms of Tourism, Tourism system: Nature, characteristic, Tourism: Components and Characteristics

(08 Lectures)

#### Unit II

**Domestic Tourism:** features, pattern of growth and profile  
**International Tourism:** Tourist generating and destination regions Tourism motivation and tourism demand

(08 Lectures)

#### Unit III

**Tourism Impacts:** Positive and Negative Impacts of Tourism; Economic, Socio-Cultural, and Environmental Impact

(07 Lectures)

#### Unit IV

**Tourism Organizations:** Objectives and Role of ITDC, TFCI, IRCTC

(07 Lectures)

#### Suggested Books and References –

1. Burkart & Medlik : Tourism: Past, Present and Future
2. Chunky Gee et-al: Travel Industry
3. Cooper C., Fletcher J., Gilbert D and Wanhil. S: Tourism: Principles and Practices
4. J.K. Sharma: Tourism Planning and Development -
5. McIntosh, R. W.: Tourism: Principles and Practices
6. Mill and Morrison: Tourism systems
7. P.C. Sinha: Tourism Management Vol. - 4
8. Prannath Seth: Successful Tourism Management
9. R. Gartner: Tourism Development
10. Sagar Singh: Studies in Tourism

#### Course Learning Outcomes:

By the end of the course, students should be able to:

1. Identify and assess the positive and negative impacts of tourism on different sectors.
2. Understand the economic effects of tourism, including income generation and employment opportunities.
3. Analyze the socio-cultural impacts of tourism on local communities and cultural heritage.
4. Recognize the environmental impacts of tourism and its effects on ecosystems and natural resources.

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## Syllabus

### SEC-011 – Data Literacy

Semester	Code of the Course	Title of the Course/Paper		NHEQF Level	Credits
I/II	SEC-011	Data Literacy		5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course
		Theory	Practical		
Introductory	Skill Enhancement	2	-	Yes	30 Hours Lecture
Prerequisites	XII Pass				
Objectives of the Course:	Objectives of the Course – The objective of this course is to develop students' data literacy skills. This course will give students skills in understanding and interpreting data from simple descriptive representation of data, to the use of graphs.				

### Examination Scheme-

#### Regular Students –

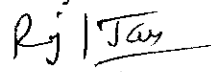
Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-011- Data Literacy	1 Hrs-MT 1 Hrs-EoSE	10 Marks-MT 40 Marks-EoSE	4 Marks-MT 16 Marks-EoSE

Question paper for Data Literacy will be so set that it has 40 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

#### Non-Collegiate Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (EoSE)	Minimum Marks (EoSE)
Theory	SEC-011- Data Literacy	1 Hrs	50 Marks	20 Marks

Question paper for Data Literacy will be so set that it has 50 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

  
**Dy. Registrar**  
 Academic

## Detailed Syllabus

### SEC-011 – Data Literacy

#### Unit – I

Data- Meaning and Types, Nature and Properties of Data, Uses of Data  
(07 Lectures)

#### Unit -II

Sources of Data, Types of Government Data, Types of Measurement, Reliability and Validity  
(07 Lectures)

#### Unit -III

Techniques of data Collection, Text as Data, Different Data sets and how to read them  
(08 Lectures)

#### Unit-IV

Data visualization, Graphical and Tabular representation of data, Types of Data Analysis  
(08 Lectures)

#### Suggested Books and References –

1. Walliman Nicholas, Research Methods- The Basics, Routledge, 2011
2. Pandey P. and Pandey M.M, Research Methodology: Tools and Techniques, Bridge Center, 2015
3. Kothari C. R. Research Methodology: Tools and Techniques, (Chapter 6), New Age International Publishers, 1990
4. Research Methods, Alagappa University, Unit 8-11, Vikas Publishing House, 2020

#### Suggested E-resources:

##### Online Lecture Notes and Course Materials:

1. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=sP9KhysDemvbqPHPOAmaYw==>
2. <https://egyankosh.ac.in/biistream/unit2>
3. <https://www.toppr.com/guides/maths/statistics/data/>
4. <https://www.simplilearn.com/what-is-data-article>

#### Course Learning Outcomes:

By the end of the course, students should be able to:

1. Identify different types of data and data sources
2. Evaluate how quantitative data is used within everyday life and academics:
3. Recognise the limitations of quantitative data;
4. Apply basic data literacy skills to practical analysis of datasets.

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## Syllabus

### SEC-012 – Biofertilizers

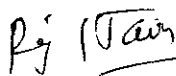
Semester	Code of the Course	Title of the Course/Paper		NHEQF Level	Credits
I/II	SEC-012	Biofertilizers		5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course
		Theory	Practical		
Introductory	Skill Enhancement	2	-	No	15 Hours Lecture +30 Hours Lab Activity / Fieldwork
Prerequisites	XII Pass				
Objectives of the Course:	Objectives of the Course – The concept of biofertilizers and develop the skills for handling microbial inoculants. The growth and multiplication conditions of useful microbes and their role in mineral cycling and nutrition to plants. Various methods of decomposition of biodegradable waste and their conversion to compost				

### Examination Scheme-

#### Regular Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-012-Biofertilizers	1 Hrs-MT 1 Hrs-EoSE	5 Marks-MT 20 Marks-EoSE	2 Marks-MT 8 Marks-EoSE

Theory question paper for biofertilizers will be so set that it has 40 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

  
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## Detailed Syllabus

### SEC-012 – Biofertilizers

#### Unit –I

Biofertilizers - Introduction, status and scope; Rhizobia: isolation, purification, morphology, identification, and mass cultivation. Actinorrhizal symbiosis.

(04 Lectures)

#### Unit -II

*Azospirillum*: isolation and mass multiplication – carrier-based inoculant, associative effect of different microorganisms. *Azotobacter*: classification, characteristics – crop response to *Azotobacter* inoculum, maintenance and mass multiplication

(04 Lectures)

#### Unit –III

Cyanobacteria (blue green algae), *Azolla* and *Anabaena azollae* association, nitrogen fixation, factors affecting growth, blue green algae and *Azolla* in rice cultivation. FCO specifications and quality control of biofertilizers

(04 Lectures)

#### Unit-IV

Mycorrhizal association, types of mycorrhizal association, taxonomy, occurrence and distribution, phosphorus nutrition, growth and yield – colonization of VAM – isolation and inoculum production of VAM, and its influence on growth and yield of crop Plants

(03 Lectures)

#### Practical:

1. Sterilization of glassware, culture media, other substances, materials and equipment
2. Study of heterocyst in cyanobacteria.
3. Isolation and culturing of Rhizobium from root nodules of leguminous crops.
4. Preparation of media for microbial biofertilizers.
5. Preparation of media for microbes.
6. Isolation of Azotobacter from root nodules of leguminous crops.
7. Cultivation of blue green algae.
8. Study of different types of Cyanobacteria used for nitrogen fixation.
9. Study various biocontrol methods and their application Pheromone trap, Trichoderma, Pseudomonas, Neem etc.
10. Preparation of Vermicompost.

(30 Hours Lab Activity)

#### Suggested Books and References –

1. Dubey, R.C. (2005). A Text Book of Biotechnology. S. Chand and Co. New Delhi.
2. John Jothi Prakash, E. (2004). Outlines of Plant Biotechnology. Emkay Publication. New Delhi.



3. Kumaresan. V. (2005). Biotechnology. Saras Publications, New Delhi.
4. Sathe, T.V. (2004). Vermiculture and Organic Farming. Daya Publishers.
5. Subha Rao, N.S. (2000). Soil Microbiology. Oxford and IBH Publishers. New Delhi.
6. Vayas, S.C, Vayas, S. and Modi, H.A. (1998). Bio-fertilizers and organic Farming. Akta Prakashan, Nadiad
7. Somani, L.L. (2004). Handbook of Biofertilizers. Agrotech Publishing Academy, Udaipur-313002
8. Khosla, R. (2017). Biofertilizers and Biocontrol Agents for Organic Farming Kojo Press
9. Trueman's Biofertilizers. (2018). Trueman Book Company, Jalandhar.

### Suggested E-resources:

1. Azotobacter - Isolation and characterization -- <https://youtu.be/1Z1VhgJ2h6U>
2. Rhizobium -- Identification and characterization - <https://youtu.be/jELlo-pMvc4>

### Course Learning Outcomes:

By the end of the course, students should be able to:

1. Develop conceptual skill about identifying microbes, and bio-fertilizers
2. Gain knowledge about developing commercial enterprise of bio-fertilizers.

*P. J. Jais*  
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## Syllabus

### SEC-013 – Nursery & Gardening Techniques



Semester	Code of the Course	Title of the Course/Paper		NHEQF Level	Credits
I/II	SEC-013	Nursery & Gardening Techniques		5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course
		Theory	Practical		
Introductory	Skill Enhancement	2	-	No	15 Hours Lecture +30 Hours Lab Activity / Fieldwork
Prerequisites	Biology courses of Central Board of Secondary Education or equivalent.				
Objectives of the Course:	Objectives of the Course – The program is aimed to teach students the basic knowledge required to develop entrepreneurship skills in the development of Nursery, Gardening and Landscaping. This course would train students to initiate a remunerative enterprise owing to a high demand of skilled professionals in this field				

### Examination Scheme-

#### Regular Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-013- Nursery & Gardening Techniques	1 Hrs-MT 1 Hrs-EoSE	5 Marks-MT 20 Marks-EoSE	2 Marks-MT 8 Marks-EoSE

Theory question paper for Nursery & Gardening Technique will be so set that it has 40 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hour. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

  
 Registrar  
 Academic  
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## Detailed Syllabus

### SEC-013 – Nursery & Gardening Techniques

#### Unit -I

Nursery: definition, objectives and scope and building up of infrastructure for nursery, planning and seasonal activities - Planting - direct seeding and transplants.

(03 Lectures)

#### Unit -II

Seed: Structure and types - Seed dormancy; causes and methods of breaking dormancy-Seed storage: Seed banks, factors affecting seed viability, genetic erosion – Seed production technology - seed testing and certification

(04 Lectures)

#### Unit -III

Vegetative propagation: air-layering, cutting, selection of cutting, collecting season, treatment of cutting, rooting medium and planting of cuttings - Hardening of plants – green house - mist chamber, shed root, shade house and glass house

(04 Lectures)

#### Unit-IV

Gardening: definition, objectives and scope - different types of gardening-landscape and home gardening, parks and its components - plant materials and design-computer applications in landscaping, Gardening operations: soil laying, manuring, watering, management of pests and diseases and harvesting.

(04 Lectures)

#### Practical: -

1. Study of germination of dormant & non-dormant seeds (Pea, tomato, maize, bean).
2. Seed viability test.
3. To estimate bulk density and porosity of Garden soils.
4. To determine moisture content & water holding capacity of Garden Soils.
5. Study of different types of tools & accessories for Nursery
6. Methods of preparation of nursery beds and sowing of seeds.
7. Media for propagation of plants in Nursery Beds, Pots and Mist chamber.
8. Study and practice of different propagation methods viz., cutting, layering, division, grafting and budding.
9. Introduction and practicing Bonsai training, pruning and wiring.
10. Study of different types of gardens (indoor and outdoor) and key features of gardens (Paths & Avenues, Hedges & Edges, Lawn, Flowerbeds, Arches & Pergolas, Fencing, Water bodies, Rock Garden).
11. Visit to a horticulture/forest nursery
12. Hands on training on sowing methods of seed and vegetative propagation techniques

(30 Hours Lab Activity)

### Suggested Books and References –

1. Agrawal, P.K. (1993). Hand Book of Seed Technology. Dept. of Agriculture and Cooperation, National Seed Corporation Ltd., New Delhi.
2. Bose T.K. and Mukherjee, D. (1972). Gardening in India, Oxford and IBH Publishing Co., New Delhi.
3. Jules J. (1979). Horticultural Science. (3rd Ed.), W.H. Freeman and Co., San Francisco, USA.
4. Kumar, N. (1997). Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
5. Sandhu, M.K. (1989). Plant Propagation, Wile Eastern Ltd., Bangalore, Madras
6. Ratha Krishnan, M. *et al.*, (2014). Plant Nursery management: Principles and Practices, Central Arid Zone Research Insititute (ICAR) Jodhpur, Rajasthan.
7. Roy, R. K., Roy, R. K. (2013). Fundamentals of Garden Designing: A Colour Encyclopaedia. India: New India Publishing Agency.
8. Littlepage, R., Littlepage, R. (2017), Fundamentals of Garden Design: An Introduction to Landscape Design. (n.p.): Create Space Independent Publishing Platform

### Course Learning Outcomes:

By the end of the course, students should be able to:

1. Describe and differentiate between the types of gardens.
2. Develop conceptual of nursery and gardening.
3. Gain knowledge about developing commercial enterprise of nursery

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## Syllabus

### SEC-014 –अनुवाद कौशल

Semester	Code of the Course	Title of the Course/Paper			NHEQF Level	Credits
I/II	SEC-014	अनुवाद कौशल			5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course	
		Theory	Practical			
Introductory	Skill Enhancement	2	-	Yes	30 Hours Lecture	
Prerequisites	XII Pass					
Objectives of the Course:	Objectives of the Course – 1. अन्य भाषा के साहित्य को लक्ष्यभाषा में उपलब्ध करवाना 2. वैश्विक ज्ञान को लक्ष्यभाषा में उपलब्ध करवाना 3. ज्ञान का विस्तार					

### Examination Scheme-

#### Regular Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-014- अनुवाद कौशल	1 Hrs-MT 1 Hrs-EoSE	10 Marks-MT 40 Marks-EoSE	4 Marks-MT 16 Marks-EoSE

Question paper for अनुवाद कौशल will be so set that it has 40 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

#### Non-Collegiate Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-014- अनुवाद कौशल	1 Hrs	50 Marks	20 Marks

Question paper for अनुवाद कौशल will be so set that it has 50 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

## Detailed Syllabus

### SEC-014 – अनुवाद कौशल

#### Unit –I

- अनुवाद, आवश्यकता और महत्त्व
- अनुवाद के प्रकार
- अनुवाद की प्रक्रिया

#### Unit –II

- अनुवाद कार्य की प्रकृति
- अनुवाद और समतुल्यता
- अनुवाद की समस्याएँ

#### Unit –III

- अँग्रेजी से हिन्दी में अनुवाद
- अन्य भारतीय भाषाओं से हिन्दी में अनुवाद
- प्रशासनिक-पारिभाषिक शब्दावली

#### Unit-IV

- पाठ : मालगुडी डेज़ – मालगुडी की कहानियाँ आर. के. नारायण (02 कहानियाँ)

### Suggested Books and References –

1. मालगुडी की कहानियाँ, आर.के. नारायण, राजपाल एंड संस, नई दिल्ली, 2017
2. अनुवाद : सिद्धांत एवं व्यवहार, डॉ. जयन्ती प्रसाद नौटियाल, राजकमल प्रकाशन, नई दिल्ली
3. अनुवाद सिद्धांत और प्रयोग, जी. गोपीनाथन, अभिजीत पब्लिकेशन्स, 2008
4. अनुवाद : सिद्धांत और समस्याएँ, डॉ. रवीन्द्रनाथ श्रीवास्तव- डॉ. कृष्णकुमार गोस्वामी, आलेख प्रकाशन, 2008

### Suggested E-resources:

1. Online Lecture Notes and Course Materials:

### Course Learning Outcomes:

अनुवाद कौशल के अध्ययन को पूरा करने पर, छात्र निम्नलिखित क्षमताओं को प्राप्त करेंगे-

1. अनुवाद शब्द की परिभाषा और इसे सभी भाषाओं के बीच संवाद में महत्वपूर्णता की व्याख्या करना।
2. भाषाई और सांस्कृतिक अंतरों को पार करने में अनुवाद के भूमिका को पहचानना।
3. साहित्यिक, तकनीकी, कानूनी और वैज्ञानिक अनुवाद सहित विभिन्न अनुवाद प्रकार के बीच अंतर करना।
4. प्रत्येक प्रकार के अनुवाद के साथ जुड़े विशेष चुनौतियों का विश्लेषण करना।
5. स्रोत पाठ विश्लेषण से लेकर लक्ष्य पाठ उत्पादन तक की विभिन्न चरणों की जाँच करना।
6. सटीक और सांस्कृतिक रूप से सही अनुवाद उत्पन्न करने में शामिल कदमों का वर्णन करना।
7. लाक्षणिक अनुवाद पैराफ्रेजिंग, अनुकूलन और स्थानीयकरण जैसे विभिन्न अनुवाद विधियों के साथ अलग-अलग होना।
8. पाठ की प्रकृति और लक्ष्य दर्शक के आधार पर उपयुक्त विधियों का प्रयोग करना।

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9. अनुवाद समता की अवधारणा समझें और स्रोत पाठ के अर्थ और शैली को बनाए रखने में इसकी भूमिका समझना।
10. अर्थ की प्राप्ति में सामान्य चुनौतियों का विश्लेषण करना, जैसे कि मुहावरे और सांस्कृतिक सूक्ष्मताएँ।
11. रूपांतरण, सुचनांक, और सांस्कृतिक प्रतिस्थानन जैसी तकनीकों का अन्वेषण करें ताकि इच्छित अर्थ को प्रभावी रूप से प्रस्तुत करना।
12. इन तकनीकों को विभिन्न अनुवाद परिदृश्यों में लागू करना।
13. लक्ष्य भाषा में पठनीयता को बनाए रखते हुए स्रोत पाठ के प्रति वफादारी के लिए अनुवादक की जिम्मेदारी को मान्यता देना।
14. अनुवाद प्रक्रिया के दौरान अनुवादकों के द्वारा नैतिक विचारणाएँ और चुनौतियों का मूल्यांकन करना।
15. अंग्रेजी से हिंदी में चयनित अंशों का अनुवाद करना, जिससे कि पाठ्यक्रम में सीखे गए अनुवाद सिद्धांतों की समझ प्रदर्शित हो सके।
16. सटीक और प्रभावी अनुवाद के लिए उपयुक्त विधियों, तकनीकों, और रणनीतियों का प्रयोग करना।

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JAIPUR  
*RW*

## Syllabus

### SEC-015 – प्रभावी हिन्दी लेखन

Semester	Code of the Course	Title of the Course/Paper			NHEQF Level	Credits
I/II	SEC-015	प्रभावी हिन्दी लेखन			5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course	
		Theory	Practical			
Introductory	Skill Enhancement	2	-	Yes	30 Hours	
Prerequisites	XII Pass					
Objectives of the Course:	Objectives of the Course – 1. विद्यार्थी को लेखन स्तर पर कुशल बनाना 2. विविध लेखन शैलियों व शब्द भण्डार का ज्ञान 3. अभिव्यक्ति की सशक्तता और सटीकता प्राप्त करना					

### Examination Scheme-

#### Regular Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-015- प्रभावी हिन्दी लेखन	1 Hrs-MT 1 Hrs-EoSE	10 Marks-MT 40 Marks-EoSE	4 Marks-MT 16 Marks-EoSE

Question paper for प्रभावी हिन्दी लेखन will be so set that it has 40 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

#### Non-Collegiate Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (EoSE)	Minimum Marks (EoSE)
Theory	SEC-015- प्रभावी हिन्दी लेखन	1 Hrs-EoSE	50 Marks-EoSE	20 Marks-EoSE

Question paper for प्रभावी हिन्दी लेखन will be so set that it has 50 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

  
 Registrar



## Detailed Syllabus

### SEC-015 - प्रभावी हिन्दी लेखन

#### Unit -I

- लेखन -कौशल की आवश्यकता
- लेखन कौशल के उद्देश्य
- लेखन कौशल का विकास

#### Unit -II

- रचनात्मक आयाम
- पत्र लेखन
- रिपोर्ट लेखन
- कहानी लेखन
- फीचर लेखन

#### Unit -III

- प्रायोगिक आयाम
- कार्यशाला
- उच्चारण अभ्यास (जैसा बोलेंगे वैसा लिखेंगे)

#### Unit-IV

- शब्दकोश का उपयोग
- वर्तनी अशुद्धि परिमार्जन
- वक्तृता कौशल

### Suggested Books and References -

1. रचनात्मक लेखन, संपा रमेश गौतम, भारतीय ज्ञानपीठ-वाणी प्रकाशन 2022 नई दिल्ली
2. मीडिया लेखन, वाणी प्रकाशन 2018, तीसरा संस्करण, नई दिल्ली
3. रेडियो लेखन, राजेन्द्र मिश्र, तक्षशिला प्रकाशन, 2009
4. पटकथा : एक परिचय, मनोहर श्याम जोशी, राजकमल प्रकाशन, 2000, नई दिल्ली

### Course Learning Outcomes:

प्रभावी लेखन कौशल" को पूरा करने पर, छात्र निम्नलिखित क्षमताओं को प्राप्त करेंगे:

1. विभिन्न व्यक्तिगत और पेशेवर प्रसंगों में मजबूत लेखन कौशल के महत्व को मान्यता देना।
2. स्पष्ट संवाद में सहायक होने और विचारों को प्रस्तुत करने में प्रभावी लेखन का योगदान समझना।
3. लेखन कौशल का विकसन करने के लक्ष्यों को पहचानना, जिसमें स्पष्टता, प्रसंज्ञानशीलता, और लिखित संवाद में रुचिकरता को बढ़ावा देना शामिल है।
4. विचारों को स्पष्ट और सुसंगत तरीके से लिखकर व्यक्त करने की क्षमता को बढ़ावा देना।
5. सुधारित लेखन प्रवीणता के लिए व्याकरण नियम, विराम चिह्न, और वाक्यबद्धता का उपयोग करना।
6. रचनात्मक आयामों में गहराई में जाएं, जिसमें कल्पनाशील और कलात्मक अभिव्यक्तियाँ शामिल होंगी।
7. ऐतिहासिक भाषाका प्रयोग करके पाठकों को रोचक तरीके से आकर्षित करने वाले लेखित कार्य बनाना।
8. विभिन्न उद्देश्यों के लिए दैनिक पत्र, ईमेल, और संवादों को तैयार करने में परिपूर्णता विकसित करना।
9. दैनिक संवाद में प्रभावी तर्क से संवाद करने के लिए उपयोग, भाषा और भाषा का प्रयोग करना।

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Registrar

10. ऐसे निबंध, रिपोर्ट, और संक्षेप तैयार करने की प्रवीणता हासिल करना जो जानकारी और विचारों को प्रभावी रूप से प्रस्तुत करता हो।
11. विभिन्न लेखन प्रारूपों के विशिष्ट घटकों और संरचनाओं को समझना।
12. आकर्षक और संवादात्मक कथानकों को तैयार करने के कौशल हासिल करना।
13. अच्छी तरह से प्लॉट और पात्र विकास के साथ कहानियों को बनाने की क्षमता विकसित करना।
14. फीचर लेखन की कला और उसकी तकनीकों को समझना, जिनसे जानकारी को रचनात्मक तरीके से प्रस्तुत किया जा सकता हो।
15. पाठकों को सूचित करने और मनोरंजन करने वाले लेखों को तैयार करने के लिए उपयुक्त तकनीकों का प्रयोग करना।
16. रिज्यूम, कवर पत्र, और प्रस्तावों जैसे दस्तावेजों के लिए आवश्यक प्रैक्टिकल लेखन कौशल की ज्ञान प्राप्त करना।
17. योग्यता और संवाद को प्रभावी बनाने के लिए तकनीकों का प्रयोग करना।
18. सहयोग और सहकारीता को प्रोत्साहित करने वाली लेखन कार्यशालाओं में भाग लेना।
19. संवाद कौशल को और भी बेहतर बनाने के लिए सुरक्षित प्रतिक्रिया प्राप्त करना।
20. वाक्यांशों को सही ढंग से उच्चारित करने के लिए उच्चारण कौशल विकसित करना।
21. सही उच्चारण का अभ्यास करके लिखित सामग्री को मौखिक रूप से प्रभावी ढंग से संवादित करना।
22. शब्दकोषों और शब्दसंग्रहों का उपयोग शब्दावली को समृद्ध करने और शब्द चयन को बेहतर बनाने के लिए करना।
23. उच्च शब्दावली का प्रयोग करके विचारों को और अधिक स्पष्ट और जीवंत ढंग से प्रस्तुत करने का प्रयास करना।
24. सुधारने और संपादन की कला को सीखकर व्याकरण, विराम चिह्न, और शैली में सुधार करना।
25. स्पष्टता और प्रभाव के लिए लिखित काम को पूर्णता और प्रभाव के लिए पुनः संवाद करना।

*RJ*

*RJ Jain*  
 Dy. Registrar  
 (Academic)  
 University of Rajasthan  
 JAIPUR  
*RJ*

## Syllabus

### SEC-016 – Household Pests and their Management



Semester	Code of the Course	Title of the Course/Paper			NHEQF Level	Credits
I/II	SEC-016	Household Pests and their Management			5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course	
		Theory	Practical			
Introductory	Skill Enhancement	2	0	No	15 Hours Lecture +30 Hours Lab Activity / Fieldwork	
Prerequisites	XII Pass					
Objectives of the Course:	Objectives of the Course – The aim of the study is to know the basics of common household pest like cockroaches, mosquito, housefly, termite, etc. and their medical importance in human life.					

### Examination Scheme-

#### Regular Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-016- Household Pests and their Management	1 Hrs-MT 1 Hrs-EoSE	10 Marks-MT 40 Marks-EoSE	4 Marks-MT 16 Marks-EoSE

Theory question paper for **Household Pests and their Management** will be so set that it has 40 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

  
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## Detailed Syllabus

### SEC-016- Household Pests and their Management

#### Unit - I

##### Introduction to household pests and mode of disease transmission

**Housefly:** Systematic position, Morphology and identification characters, life cycle, mode of disease transmission, control measures

**Silver fish:** Systematic position, Morphology and identification characters, life cycle, their damage and control

(4 Lectures)

#### Unit -II

**Mosquito:** Systematic position, Morphology and identification characters, life cycle, role of mosquito in virus/ protozoan borne diseases, control measures-preventive and curative, WHO initiated programmes

**Ants:** Systematic position, Morphology and identification characters, castes and social life, ant mounds, their mode of damage and control

(4 Lectures)

#### Unit -III

**Termite:** Systematic position, Morphology and identification characters, castes and social life, termitarium, their mode of damage and control

**Crickets:** Systematic position, Morphology and identification characters, life cycle, control measures

(3 Lectures)

#### Unit-IV

**Cockroach:** Systematic position, Morphology and identification characters, life cycle, spread of diseases carrying pathogens, control measures

**Bedbug:** Systematic position, Morphology and identification characters, life cycle, inflammation and their control measures

**Pediculus:** Systematic position, Morphology and identification characters, life cycle, *Pediculus* borne disease and their control measures

(4 Lectures)

#### Practicums:

##### I. Permanent slides

**Mosquito:** W.M. of adults of *Anopheles*, *Aedes*, or *Culex* (male and female), larvae of mosquito; *Anopheles*, *Aedes*, or *Culex*

**Cockroach:** nymph stage

**Silver fish:** W.M. ; **Bedbug:** W.M.

**Termite:** W.M. of termite castes: queen, soldier: nasute & mandibulate, worker

**Ants:** W. M ; **Pediculus:** W.M

2. **Specimens:** *Periplaneta americana*, *Musca domestica*, crickets

3. **Laboratory rearing and study of life cycle of mosquitoes (any one genera: *Anopheles*, *Aedes*, or *Culex* spp.)**

4. **Laboratory rearing and study of life cycle of cockroaches**

5. **Field visits to study termitarium, ant mounds and mosquito breeding sites**

(30 Hours Lab Activity)

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### Suggested Books and References –

1. Medical and Veterinary Entomology by Gary R. Mullen and Lance A. Durden, 3rd Edition 2009, ISBN 978-0-12-814043-7.
2. Insect-Borne Diseases in the 21st Century by Marcello Nicoletti, 2020, ISBN 978-0-12-818706-7
3. Pests and vector-borne diseases in the livestock industry by Garros, Claire, editor.; Bouyer, Jérémy, editor.; Takken, Willem, editor.; Smallegange, Renate C., 2018, ISBN: 9789086868636
4. Biological and environmental control of disease vectors by Cameron, M. M. (Mary M.), editor.; Lorenz, L. M. (Lena M.), 2013, ISBN: 9781845939861



### Suggested E-resources:

1. Medically important vectors:  
<https://vidyamitra.inflibnet.ac.in/index.php/content/index/5fd9f1678007bef4453de567>

### Course Learning Outcomes:

By the end of the course, students should be able to:

1. To understand the common household pest
2. Able to differentiate between various household pest on the basis of their basic morphological characters and life cycle.
3. Student will be able to answer which life stage is damaging to the human dwellings
4. Student will be aware of common disease-causing vectors inhabiting our houses like mosquito, housefly, bedbug, termites, etc.
5. Gain awareness about the diseases they spread like malaria, dengue, chikungunya, local inflammation, diarrhoea, etc.
6. Able to manage and control these pests with basic knowledge given

  
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## Syllabus

### SEC-017 – VERMICOMPOSTING

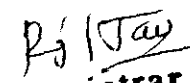

Semester	Code of the Course	Title of the Course/Paper			NHEQF Level	Credits
I/II	SEC-017	Vermicomposting			5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course	
		Theory	Practical			
Introductory	Skill Enhancement	2	-	No	15 Hours Lecture +30 Hours Lab Activity / Fieldwork	
Prerequisites	XII Pass					
Objectives of the Course:	Objectives of the Course – This is a skill-oriented course aimed to understand the concept of vermicomposting, get hands-on experience while learning and to practice it techniques in appropriate site/location.					

### Examination Scheme-

#### Regular Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-017- Vermicomposting	1 Hrs-MT	10 Marks-MT	4 Marks-MT
		1 Hrs-EoSE	40 Marks-EoSE	16 Marks-EoSE

Theory question paper for Vermicomposting will be so set that it has 40 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

  
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## Detailed Syllabus

### SEC-017- Vermicomposting

#### Unit - I

**Earthworms** – Taxonomic position, external features- shape, size, colour, segmentation, setae & clitellum. Reproductive system-Male & Female, copulation, cocoon formation & fertilization; ecological grouping – Epigeic species, Endogeic species and Anecic.

(4 Lectures)

#### Unit -II

**Vermiculture** – definition, scope and importance; common species for culture; Environmental parameters; culture methods – wormery – breeding techniques; indoor and outdoor cultures - monoculture and polyculture – merits and demerits; Limiting factors-climatic factors, pH, humidity, Temperature, gases, xenobiotics

(4 Lectures)

#### Unit -III

**Vermicomposting** of wastes in field pits, ground heaps, tank method, roof shed method, wedges & bin method; harvesting the compost, storage, Vermiwash-Preparation and application vermicomposting harvest and processing. Nutritional composition of vermicompost; Comparison with other fertilizers.

(4 Lectures)

#### Unit-IV

**Applications** of vermiculture –use of vermicastings in organic farming/horticulture, earthworms for management of municipal/selected biomedical solid wastes: as feed/bait for capture/culture fisheries; forest regeneration.

(3 Lectures)

#### Practicals:

1. Collection of earthworms from soil and identification
2. Study of life stages and development of Earthworms
3. Study of vermiculture, Vermiwash and vermiculture equipment and devices
4. Analysis of vermicompost nutritional status
5. Visit to a vermicompost manufacturing unit

(30 Hours Lab Activity)

#### Suggested Books and References –



1. Sultan Ahmed Ismail, 2005. The Earthworm Book, Second Revised Edition. Goa, India Press, Goa, India.
2. Bhatnagar & Patla, 2007. Earthworm vermiculture and vermin-composting. Kalyani Publishers, New Delhi.
3. Mary Violet Christy, 2008. Vermitechnology, MJP Publishers, Chennai.
4. Aravind Kumar, 2005. Verms & Vermitechnology, A.P.H. Publishing Corporation, New Delhi.
5. Jordan & Verma, 2009. Invertebrate Zoology, Chand & Company Ltd
6. Edwards, C.A & J.R. Lofty Vermicology – The Biology of earthworm, 1997 Chapman & Hall Publications N.Y.U.S.A.

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### Course Learning Outcomes:

By the end of the course, students should be able to:

- (i) To develop basic theoretical knowledge about morphology, ecology and role of earthworms in enhancing soil fertility.
- (ii) To perform vermicomposting using the locally available organic waste items.
- (iii) To adopt vermicomposting as a tool of organic farming on a smaller scale.

  
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## Syllabus

### SEC-018 – Understanding Union Budget and Economic Survey

Semester	Code of the Course	Title of the Course/Paper		NHEQF Level	Credits
I/II	SEC-018	Understanding Union Budget and Economic Survey		5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course
		Theory	Practical		
Introductory	Skill Enhancement	2	-	Yes	30 Hours Lecture
Prerequisites	XII Pass				
Objectives of the Course:	Objectives of the Course – The course seeks to familiarize students with basic concepts related to the Union Budget and Economic Survey. It aims to equip students with sufficient knowledge and skills to analyze budget and economic survey.				

### Examination Scheme-

#### Regular Students –

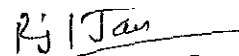
Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-018-Understanding Union Budget and Economic Survey	1 Hrs-MT 1 Hrs-EoSE	10 Marks-MT 40 Marks-EoSE	4 Marks-MT 16 Marks-EoSE

Theory question paper for Understanding Union Budget and Economic Survey will be so set that it has 40 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

#### Non-Collegiate Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (EoSE)	Minimum Marks (EoSE)
Theory	SEC-018-Understanding Union Budget and Economic Survey	1 Hrs	50 Marks	20 Marks

Question paper for Understanding Union Budget and Economic Survey will be so set that it has 50 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

  
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## Detailed Syllabus

### SEC-018- Understanding Union Budget and Economic Survey

#### Unit -I

Types of Expenditures, Revenue/Receipts, Taxes and Deficits; Introduction to budget; Types of Budgets- Traditional, Zero Based, Gender and Incremental Budgeting; Need for the budget.

(07 Hours Lecture)

#### Unit -II

Process of Union budget making in India; Components of Union Budget; Structure of Union Budget; Budget Estimates- Actual, Revised and Budget Estimates; Important Features of Union Budget and State Budget.

(08 Hours Lecture)

#### Unit- III

Importance of the Economic Survey, Main Ingredients of Economic Survey; The Current State of the Economy. Recent Fiscal Developments.

(07 Hours Lecture)

#### Unit- IV

Main Features of Physical, Digital and Social Infrastructures; Current Policy Emphasis; Challenges for the Economy.

(08 Hours Lecture)

#### Suggested Books and References –

Given the nature of the course, readings will be updated every year

1. Centre for Budget and Governance Accountability. Recent reports.
2. Ministry of Finance, Economic and social classification of the budget.
3. Ministry of Finance, Union budget (lates).
4. Ministry of Finance, Economic Survey (latest).
5. State Budget, Government of Rajasthan (latest).

#### Course Learning Outcomes:

By the end of the course, students should be able to –

1. Understand the concepts of government expenditures, revenue, taxes, and deficits, and their roles in public finance.
2. Differentiate between various types of expenditures and taxes, and explain their significance.
3. Comprehend the purpose and importance of creating budgets and the different budgeting approaches.
4. Explain the process of formulating the Union Budget in India and its key components.
5. Analyze budget estimates, actual figures, and revised estimates in the context of government

6. Recognize the role and significance of the Economic Survey in assessing the nation's economic health.
7. Identify the main sections and elements of the Economic Survey and interpret its findings.
8. Describe the current economic state of the country based on data from the Economic Survey.
9. Evaluate recent fiscal developments and their implications.
10. Differentiate between physical, digital, and social infrastructures, and understand their importance.
11. Assess current policy priorities and challenges in the economic landscape.
12. Analyze policy measures aimed at addressing economic challenges and promoting growth.

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## Syllabus

### SEC-019 – Survey Methodology

Semester	Code of the Course	Title of the Course/Paper		NHEQF Level	Credits
I/II	SEC-019	Survey Methodology		5	2
Level of Course	Type of the Course	Credit Distribution		Offered to NC Student	Delivery Type of the Course
		Theory	Practical		
Introductory	Skill Enhancement	2	-	Yes	30 Hours Lecture
Prerequisites	XII Pass				
Objectives of the Course:	Objectives of the Course – Survey methodology as a scientific field seeks to identify principles about the sample design, data collection instruments, statistical adjustment of data and data processing that can create systematic and random survey errors.				

### Examination Scheme-

#### Regular Students –

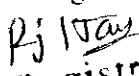
Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (Midterm + EoSE)	Minimum Marks (Midterm + EoSE)
Theory	SEC-019-Survey Methodology	1 Hrs-MT	10 Marks-MT	4 Marks-MT
		1 Hrs-EoSE	40 Marks-EoSE	16 Marks-EoSE

Theory question paper for Survey Methodology will be so set that it has 40 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

#### Non-Collegiate Students –

Type	Paper code and Nomenclature	Duration of Examination	Maximum Marks (EoSE)	Minimum Marks (EoSE)
Theory	SEC-019-Survey Methodology	1 Hrs	50 Marks	20 Marks

Question paper for Survey Methodology will be so set that it has 50 multiple choice questions (Bilingual) of One mark each. The Question paper will be of duration of 1 hours. The examinees will have to give their answers on OMR sheet only to be provided by the University whose evaluation will be done based on OMR Scanning Technology.

  
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## Detailed Syllabus

### SEC-019 – Survey Methodology

#### Unit-I

Introduction; types of data; Sources of data; methods of data collection; Survey Design- Coverage and sampling, Choosing the method collecting data, writing effective questions, the logic of constructing questionnaires, testing survey questions.

(07 Hours Lecture)

#### Unit-II

Face-to-face interviews, Telephone surveys, Self-administered questionnaires: mail surveys and other applications, Internet surveys, Interactive Voice Response, Mixed mode surveys: When and why.

(08 Hours Lecture)

#### Unit-III

Processing of survey data- Data cleaning, Weighting survey data and checking for consistency; Incomplete data: Diagnosis, Imputation and accommodating measurement errors; The basic of data Management; Representation of sample data.

(07 Hours Lecture)

#### Unit-IV

Descriptive Statistics Analysis (Applications) – Mean, Median, Mode, Dispersion, Skewness and Kurtosis.

(08 Hours Lecture)

#### Suggested Books and References –

1. Andres, Lesley (2012). *Designing and Doing Survey Research*, London: Sage.
2. Dillman, D.A. (1978) *Mail and telephone surveys: The total design method*, New York: Wiley.
3. Edith D. de Leeuw, Joop Hox, Don Dillman (2008). *International Handbook of Survey Methodology*, Routledge.
4. Engel, U., Jann, B., Lynn, P., Scherpenzeel, A. and Sturgis, P. (2014). *Improving Survey Methods: Lessons from Recent Research*, New York: Routledge.
5. Groves, R.M.; Fowler, F. J.; Couper, M.P.; Lepkowski, J.M.; Singer, E.; Tourangeau, R. (2009). *Survey Methodology*. New Jersey: John Wiley & Sons.
6. Kumar, R. (2014). *Research methodology: A step by step guide for beginners*. 4th ed. Sage Publications.

#### Course Learning Outcomes:

By the end of the course, students should be able to develop an understanding of how commonly available data is collected and processed.

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## SYLLABUS

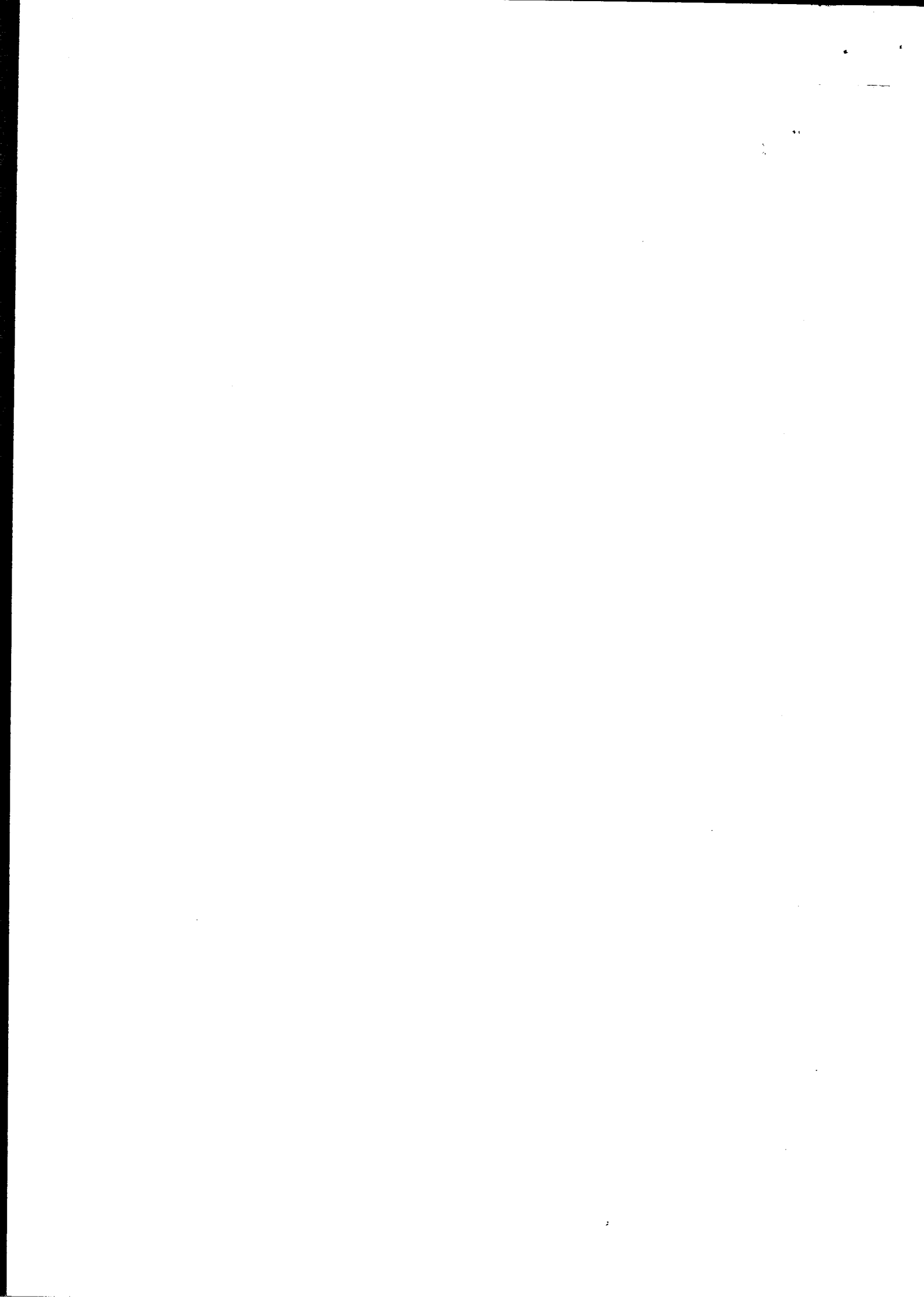
(Three/Four Year Under Graduate Programme in Science)

I & II Semester

Examination-2023-24

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Pass Course

**University of Rajasthan**

**UG0802 Four- Year Bachelor of Science (B.Sc.)**

**Subject/Discipline-Zoology**

**Syllabus: B.Sc. Semester I**

**(2023-2024)**

ZOO- 51T-101 : 3 Hrs duration 20+80 Marks 8+32 Marks  
ZOO- 51P-102 : 4 Hrs. duration 10+40 Marks 4+16 Marks

Code of the Course	Title of the Course	Level of the Course	Credits of the Course
ZOO- 51T-101	Animal Diversity	5	4
Type of Course		Delivery Type of the Course	
Major		Lectures: 60 lectures including diagnostic and informative assessments during lecture hours	
Prerequisites	Biology courses of Central Board of Secondary Education or equivalent		
Objectives of the Course	The main purpose of introducing this course is to teach the students the Morpho-taxonomy, and evolutionary relationships among and between non-chordates and chordates along with creating awareness and concern towards importance of animal diversity for human survival and its socioeconomic significance. In addition to this, the course is aimed at nurturing skills of conducting scientific inquiry and experimentation in the field of animal diversity to acquire knowledge of fundamental concepts and theories of animal diversity.		

**Syllabus**

**Animal Diversity**

**Section – A**

**LOWER INVERTEBRATES**

Unit 1: Protista/Protozoa: General Characteristics and Classification up to classes;

Locomotory Organelles and locomotion in Protozoa. 3 hrs

Unit 2: Porifera : General characteristics and Classification up to classes; Canal system in

Porifera. 3 hrs

Unit 3: Coelenterata (Cnidaria): General characteristics and Classification up to classes;

Polymorphism in Hydrozoa. 3 hrs

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- Unit 4: Helminthes: Platyhelminthes: General characteristics and Classification up to classes; Life cycle of *Taenia solium* and its parasitic adaptations.  
Nemathelminthes : General characteristics and Classification up to classes; Life cycle of *Ascaris lumbricoides* and its parasitic adaptations. 6 hrs

## Section – B

### HIGHER INVERTEBRATES

- Unit 1: Annelida : General characteristics and Classification up to classes; Formation of Coelom; Metamerism in Annelida. 3 hrs  
Unit 2: Arthropoda: General characteristics and Classification up to classes; Larval forms in Arthropoda, Metamorphosis in Insects. 5 hrs  
Unit 3: Mollusca: General characteristics and Classification up to classes; Torsion and detorsion in Gastropoda; Pearl Formation. 4hrs  
Unit 4: Echinodermata: General characteristics and Classification up to classes; Water-vascular system in Asteroidea. 3 hrs

## Section –C

### LOWER VERTEBRATES

- Unit 1: Protochordata: General characteristics and Classification of Protochordata up to orders; Retrogressive metamorphosis. 3 hrs  
Unit 2: Agnatha: General characteristics and outline classification of cyclostomes up to classes; Ammocoete larva 3 hrs  
Unit 3: Pisces: General characteristics and Classification up to order. Parental care in fishes and Migration in fishes. 5 hrs  
Unit 4: Aquatic adaptation in fishes; Origin fins; Scales of fishes; Osmoregulation in Fishes. 4 hrs

## Section –D

### HIGHER VERTEBRATES

- Unit 1: Amphibia: General characteristics and classification up to order; Neotany; Parental care in Amphibians. 3 hrs  
Unit 2: Reptilia: General characteristics and classification up to order; Identification of Poisonous and non-poisonous snakes; Biting mechanism in Snakes. 4 hrs  
Unit 3: Aves: General characteristics and classification up to order; Types of feathers; Flight adaptations and Migration in birds. 4 hrs  
Unit 4: Mammals: General characteristics and classification up to orders; Dentition in Mammals; Adaptive radiation in mammals. 4 hrs

**Recommended Books:**

1. Barnes, R.D. (2006) Invertebrate Zoology. VII Edition, Cengage Learning, India.
2. Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. and Spicer, J.I. (2002) The Invertebrates: A New Synthesis. III Edition, Blackwell Science
3. Young, J. Z. (2004) The Life of Vertebrates. III Edition. Oxford university press.
4. Jordan E.L., Verma P. S.(2022): Invertebrate Zoology. S. Chand and Company Limited.
5. Jordan E.L., Verma P. S.(2022): Chordate Zoology. S. Chand and Company Limited.

**Suggested Readings:**

1. Barrington, E.J.W. (2012) Invertebrate Structure and Functions. II Edition, EWP Publishers
2. Ruppert, E.E., Fox, R.S., Barnes, R. D. (2003) Invertebrate Zoology: A Functional Evolutionary Approach. VII Edition, Cengage Learning, India
3. Pechenik, J. A. (2015) Biology of the Invertebrates. VII Edition, McGraw-Hill Education
4. Pough H. Vertebrate Life, VIII Edition, Pearson International
5. Kachhwaha, N and Kaushik, P (2019): Freely online available gaming website-[innovativezoology.com](http://innovativezoology.com) to study vertebrate and invertebrate classification.

**Course Learning Outcome:** Upon completion of the course, students will be able to:

1. Learn Morpho-taxonomy and structural organization of non-chordate and chordate groups.
2. Acquire knowledge of diversity of non-chordate and chordate groups.
3. Learn evolutionary relationships and phylogeny of non-chordates and chordates through functional and structural similarities.
4. Understand the economic importance of non-chordates and chordates and their significance in the ecosystem.
5. Promote shared learning through practical classes, class room presentations and projects.

**University of Rajasthan**  
**B.Sc. Semester I (2023-2024)**  
**Practical-Zoology (ZOO- 51P-102)**

**ZOO- 51P-102**

**: 4 Hrs. duration 10+40 Marks**

**4+16 Marks**

**I. Microscopic Techniques:**

1. Organization and working of Optical Microscope: Dissecting and compound microscopes.

2. General methods of microscopic slide preparations: Narcotization; fixing and preservation; washing; staining; destaining; dehydration; clearing and mounting.
3. General idea of composition, preparation and use of:
  - (i) Fixatives: Formalin, Bouin's fluid.
  - (ii) Stains: Aceto-carmin, Aceto-orcin, Haematoxylin, Eosin.
  - (iii) Common reagents: Normal saline, Acid water, Acid alcohol and Mayer's albumin.

## II. Study of Microscopic Slides and Museum Specimens:

**Protozoa:** *Euglena, Trypanosoma, Amoeba, Plasmodium, Paramecium, Vorticella.*

**Porifera:** *Leucosolenia, Euplectella, Spongilla,*

**Coelenterata:** *Physalia, Aurelia, Alcyonium, Sea anemone,*

**Platyhelminthes** : *Taenia, Planaria, Fasciola (WM), Miracidium, Sporocyst, Redia and Cercaria Larvae of Fasciola, Cysticercus larva.*

**Aschelminthes** : *Ascaris, Wuchereria.*

**Annelida** : *Neanthes (Nereis), Arenicola, Pheretima, Glossiphonia, Hirudo, Polygordius.*

**Onychophora** : *Peripatus*

**Arthropoda** : *Limulus, Spider, Scorpion, Centipede, Millipede, Lepas, Balanus, Eupagurus, Crab, Mantis, Pediculus, Bedbug, Termite, Cyclops, Daphnia, crustacean larvae (Nauplius, Metanauplius, Zoea, Mysis, Megalopa, Phyllosoma),*

**Mollusca** : *Chiton, Aplysia, Cypraea, Mytilus, Loligo, Nautilus. Glochidium larva*

**Echinodermata** : *Asterias, Echinus, Ophiothrix, Cucumaria, Antendon.*

**Protochordates** : *Balanoglossus, Herdmania, Amphioxus, Doliolum, Oikopleura.*

**Agnatha** : *Petromyzon, Ammocoete larva.*

**Pisces** : *Zygaena (Sphyrna), Torpedo, Chimaera; Acipenser, Clarias, Anguilla, Hippocampus, Exocoetus, Echeneis, any flat-fish, Protopterus.*

**Amphibia** : *Icthyophis Proteus, Ambystoma, Axolotl, Alytes, Hyla.*

Reptilia : *Chelone*, and Fresh Water Tortoise, *Sphenodon*,  
*Hemidactylus*, *Phrynosoma*, *Draco*, *Chameleon*;  
*Hydrophis*, *Naja*, *Viper*, *Crocodilus*, *Alligator*.

Aves: *Pavo cristatus*, *Choriotis*.

Mammals: *Ornithorhynchus*, *Kangaroo*, *Bat*, *Manis*.

III. Anatomy:

Earthworm : External features, general viscera, alimentary canal, reproductive system and nervous system.

Prawn/Squilla : External features, appendages, alimentary canal and nervous system; Hastate Plate

Pila : External features, pallial organs and nervous system; osphradium, radula.

IV. Study of the Following Through Permanent Slide Preparation: Foraminiferous shells, Sponge spicules, Spongin fibres, Gemmule, *Hydra*, *Obelia* colony and; Parapodium of *Nereis*,

V. Study of local fauna such as insects, mollusks, fishes, amphibians, reptiles, birds mammals etc. and prepare a report on it.

University of Rajasthan

B.Sc. Semester I

Scheme of Practical Examination and Distribution of Marks

ZOO- 51P-102 : 4 Hrs. duration 10+40 Marks 4+16 Marks

	Regular	Ex. /N.C. Students
1. Anatomy (any system)	6	10
2. Permanent Preparation	4	10
3. Identification and comments on Spots (1 to 10)	20	20
4. Viva Voce	5	10
5. Class Record	5	-
	10+40=50	50

**Notes:**

**\*Internal marks for regular students only**

1. Anatomy: Study of systems of the prescribed types with the help of dissection.
2. With reference to microscopic slides, in case of non-availability, the exercise should be substituted with diagrams / photographs.
3. Candidates must keep a record of all work done in the practical class and submit the same for inspection at the time of the practical examination.
4. The candidates may be asked to write detailed methodology wherever necessary and separate marks may be allocated for the same.
5. Mounting material for permanent preparations would be as per the syllabus or as available through collection and culture methods.
6. It should be ensured that animals used in the practical exercises are not covered under the wild life act 1972 and amendments made subsequently.

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**University of Rajasthan**  
**UG0802 Four- Year Bachelor of Science (B.Sc.)**  
**Subject/Discipline-Zoology**  
**Syllabus: B.Sc. Semester II**  
**(2023-2024)**

ZOO- 51T-201 : 3 Hrs duration 20+80 Marks 8+32 Marks  
 ZOO- 51P-202 : 4 Hrs. duration 10+40 Marks 4+16 Marks

Code of the Course	Title of the Course	Level of the Course	Credits of the Course
ZOO- 51T-201	<b>Comparative Anatomy and Developmental Biology of Vertebrates</b>	5	4
<b>Type of Course</b>		<b>Delivery Type of the Course</b>	
<b>Major</b>		<b>Lectures: 60 lectures including diagnostic and informative assessments during lecture hours</b>	
<b>Prerequisites</b>	<b>B.Sc. Semester I: Animal diversity</b>		
<b>Objectives of the Course</b>	<p>The course offers a complete understanding about anatomy of vertebrate animals. It educates the students regarding derivatives of integuments, skeletal system and visceral arches, anatomy of digestive system and associated glands, different respiratory organs, urinogenital organs, components of nervous system and receptors in vertebrates. Thorough understanding of essential and evolutionary aspects of comparative anatomy will be developed through pictorial presentation of different anatomical details. The course will also provide a glimpse of scope and historical background of developmental biology to the students, impart knowledge regarding basic concepts of differentiation, morphogenesis and pattern formation and insight into IVF, stem cells and cloning. Detailed understanding of essential events of developmental biology will be imparted through proper explanation of gametogenesis, and stages of embryonic development and foetal formation.</p>		

## Syllabus

### Comparative Anatomy and Developmental Biology of Vertebrates

#### Section- A

- Unit 1: Integumentary System: Structure and function of integument, Derivatives of integument glands. 4 hrs
- Unit 2: Skeletal System: Overview of skeleton; Brief account of jaw suspensorium and visceral arches. 4 hrs
- Unit 3: Digestive System: Brief account of alimentary canal and digestive glands. 3 hrs
- Unit 4: Respiratory System: Brief account of gills, lungs, air sacs and swim bladder. 4 hrs

#### Section – B

- Unit 1: Circulatory System: Evolution of heart and aortic arches. 3 hrs
- Unit 2: Urinogenital System: Succession of kidney, Evolution of urinogenital ducts. 4 hrs
- Unit 3: Nervous System: Comparative account of brain. 4 hrs
- Unit 4: Sense Organs: Types of receptors, Visual receptors in man. 4 hrs

#### Section C

- Unit 1: Scope and History of Developmental Biology; Concepts of Epigenesis, Preformation, Specification, Determination, Differentiation, Morphogenesis, Embryonic induction. 5 hrs
- Unit 2: Early Embryonic Development: Gametogenesis: Spermatogenesis and Oogenesis in mammals; parthenogenesis; Fertilization: External (amphibians), Internal (mammals), blocking mechanisms to Polyspermy. 5 hrs
- Unit 3: Types and Patterns of cleavage; Types of morphogenetic movements; Early development of frog (up to gastrula) and chick (up to 96 hrs); Fate maps, Fate of germ layers. 5 hrs

#### Section – D

- Unit 1: Late Embryonic Development: Metamorphic events in life cycle of frog and its hormonal regulation. 5 hrs
- Unit 2: Extra embryonic membranes in chick; Formation, types and functions of placenta in mammals. 5 hrs
- Unit 2: Applied Aspects of Developmental Biology: Stem cells, Cloning, Assisted Reproductive Techniques (ART). 5 hrs

#### Recommended Books:

1. Weichert C.K and William Presch (1970). Elements of Chordate Anatomy. Tata McGraw Hills

2. Hilderbrand, M and Gaslow G.E. Analysis of Vertebrate Structure. John Wiley and Sons
3. Wolpert, L & Tickle, C (2011) Principles of Developmental Biology (4th edition). Oxford University Press, ISBN: 9780198792918
4. Carlson, Bruce M (1996). Patten's Foundations of Embryology, McGraw Hill, Inc. ISBN: 9780070634275

**Suggested Readings:**

1. Kent, G.C. and Carr R.K.(2000)Comparative Anatomy of the Vertebrates. IX Edition. The McGraw-Hill Companies
2. Kardong, K.V.(2005) Vertebrates' Comparative Anatomy, Function and Evolution. IV Edition. McGraw-Hill Higher Education 29
3. Gilbert, SF (2014) Developmental Biology. X Edition. Sinauer Associates, Inc., Publishers, Sunderland, Massachusetts, USA.ISBN : 9780878939787
4. Balinsky, B.I. (2008). An Introduction to Embryology. International Thomson Computer Press.

**Course Learning Outcome:** Upon completion of this course, students should be able to:

1. Know about the levels of organization among different groups of vertebrates.
2. Understand that different organs and organ systems integrate with each other to impart proper regulation of a particular function.
3. Understand how the various organs evolved during the course of evolution through succession. • Know the evolution of different concepts in developmental biology.
4. Be able to understand the process of gamete formation from stem cell population to mature ova and sperm.
5. Be able to comprehend the sequence of steps leading to the formation of gametes and development of embryo..
6. Learn the mechanisms underpinning cellular diversity and specificity in animals.
7. Study the methods and tools related to developmental biology which help to understand different processes of embryogenesis.

**University of Rajasthan**  
**B.Sc. Semester II (2023-2024)**

**Practical-Zoology (ZOO- 51P-202)**

**ZOO- 51P-202**

**: 4 Hrs. duration 10+40 Marks**

**4+16 Marks**

1. **Osteology:** a) Skull, Atlas and Axis vertebrae of Frog, Varanus, Fowl and Rabbit.  
b) 8th vertebrae of Frog, typical thoracic, Ist and IInd sacral and caudal vertebrae of Varanus, fused thoracic and Synsacrum of Fowl, typical cervical vertebrae,



- anterior thoracic vertebrae, anterior lumbar vertebrae and Sacrum of Rabbit.  
 c) Pectoral and Pelvic girdle, Humerus and Femur, Radius-Ulna and Tibia-Fibula of Varanus, Fowl and Rabbit.

**II. Anatomy:**

Any edible fish (*Wallago/Labeo*): External features, general viscera, afferent and efferent branchial blood vessels, brain, cranial nerves.

**III. Study of the following through Permanent Slide preparations:**

Striped muscle fibers; Smooth muscle fibers, scales of edible fish, feather of birds, hair of different animals, blood film of any vertebrate.

**IV. Exercises on Developmental Biology**

1. Frog - Study of developmental stages - whole mounts and sections through permanent slides – cleavage stages, blastula, gastrula, neurula, tail bud stage, tadpole external and internal gill stages.
2. Study of Chick Embryo: 18 hrs, 21 hrs, 24 hrs, 33 hrs, 48 hrs, 72 hrs and 96 hrs of incubation.
  - (i) Study of the embryo at various stages of incubation *in vivo* by making a window in the egg-shell.

**University of Rajasthan**

**B.Sc. Part – I**

**Semester II**

**Scheme of Practical Examination and Distribution of Marks**

ZOO- 51P-202

: 4 Hrs. duration 10+40 Marks

4+16 Marks

	Regular	Ex. /N.C. Students
6. Anatomy (any system)	6	10
7. Permanent Preparation	4	10
8. Developmental Biology	6	6
9. Identification and comments on Spots (1 to 7)	14	14
10. Viva Voce	5	10
11. Class Record	5	-
	<b>10+40=50</b>	<b>50</b>

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Notes:

**\* Internal marks for regular students only**

1. Anatomy: Study of systems of the prescribed types with the help of dissection.
2. With reference to microscopic slides, in case of non-availability, the exercise should be substituted with diagrams / photographs.
3. Candidates must keep a record of all work done in the practical class and submit the same for inspection at the time of the practical examination.
4. The candidates may be asked to write detailed methodology wherever necessary and separate marks may be allocated for the same.
5. Mounting material for permanent preparations would be as per the syllabus or as available through collection and culture methods.
6. It should be ensured that animals used in the practical exercises are not covered under the wild life act 1972 and amendments made subsequently.

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# University of Rajasthan Jaipur

## SYLLABUS

(Three/Four Year Under Graduate Programme in Science)

I & II Semester

Examination-2023-24

As per NEP - 2020

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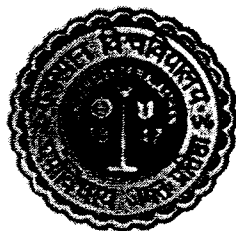
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Syllabus for B.Sc. Botany

3/4 years Undergraduate Programme

(From the Academic Year 2023-24 onwards)

(Syllabus as per NEP-2020 and Choice Based Credit System)



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**University of Rajasthan,  
Jaipur-302004**

**Vision:**

To create potential and competent professionals in Botany through the courses with practical training and advanced technical skill equipped with knowledge and aptitude for higher education and research.

**Mission:**

- Dissemination of global demand- based knowledge through teaching with technical professionalism.
- Creation of individuals with social and environmental concern.
- Training the students to create economically and environmentally viable solutions in the field of plant science.

**Programme Outcomes**

- PO1. Developing the potential for vertical career growth in plant sciences, academic and service sectors and related fields.
- PO2. Development of in-depth analytical and critical thinking, so that students would be able to identify and solve the problems with the help of botany.
- PO3. Proficient knowledge in the major domains of plant sciences including plant identification, plant diseases, microbiology, Plant biotechnology etc.
- PO4. Students can successfully learn tools and techniques related to plant research.
- PO5. After completion of course students would be able to execute their professional roles in society as botanist, plant taxonomist, plant pathologist, etc.
- PO6. Students will be able to learn skills to work as a team with the people from multidisciplinary environment.
- PO7. To design and develop sustainable solutions to major biological problems by applying appropriate tools.
- PO8. Develop skills, attitude and values required for self-directed, lifelong learning and professional development.
- PO9. Acquire knowledge and understanding of norms and ethics in the field of botany.

**B.Sc. BOTANY**  
COURSE STRUCTURE UNDER C.B.C.S. AND NEP-2020

Year	Sem	Course Code	Course Title	Credit		Marks
				T	P	
1 <sup>st</sup>			Hindi			
			English			
	I	BOT-UG-CC01	Diversity of Plant Kingdom	4	2	
	II	BOT-UG-CC02	Cell Biology, Molecular Biology and Genetics	4	2	
2 <sup>nd</sup>	III	BOT-UG-CC03	Microbiology and Plant Pathology	4	2	
	VI	BOT-UG-CC04	Plant Taxonomy and Economic Botany	4	2	
3 <sup>rd</sup>	V	BOT-UG-CC05	Plant Biochemistry and Physiology	4	2	
	VI	BOT-UG-CC06	Angiosperms Anatomy and Embryology	4	2	
4 <sup>th</sup>	VII	BOT-UG-CC07	Ecology and Conservation Biology	4	2	
	VIII	BOT-UG-CC08	Plant Biotechnology	4	2	
		<b>Discipline specific Elective</b>	Plant Tissue Culture	2	2	
			Plant Disease Management	2	2	
			Plant Stress Biology	2	2	
			Phytopharmacology	2	2	
			Genetic Engineering	2	2	
			Molecular Genetics	2	2	
		<b>Multidisciplinary Elective course</b>	Plant Propagation Techniques	2	2	
			Herbal Medicine and Human Health	2	2	
			Plant Diseases	2	2	
			Management of Crop Diseases	2	2	
			Plant Biodiversity and conservation	2	2	
		Ethnobotany	2	2		
		Phytochemistry	2	2		
		Paleobotany				

## BOT-UG-CC01 Diversity of Plant Kingdom

### Objectives

- To understand microscopic to macroscopic view of the plants.
- To differentiate algal members from different class of the kingdom Algae
- To understand structure and reproduction in bryophytes.
- To understand difference between Hepaticopsida, Anthocerotopsida and Bryopsida.
- To interpret structure, reproduction, life cycle and economic importance of Lichens.

### Course Outcome:

On completion of the course, the student would be able to develop the following:

BOT A02	
Cognitive level	Course outcome
1. Understanding	<ul style="list-style-type: none"><li>➤ To aware students, diversity of plants present in various habitats.</li><li>➤ To understand microscopic to macroscopic view of the plants.</li><li>➤ To interpret amphibious to symbiotic relationship of the plants.</li></ul>
2. Memorizing	<ul style="list-style-type: none"><li>➤ Diagrammatic representation of the algae, bryophytes and lichens.</li><li>➤ Habit, habitat, thallus organization of various members.</li><li>➤ Typical type of Life cycles found in algae and bryophytes.</li></ul>
3. Applying	<ul style="list-style-type: none"><li>➤ Economic importance of algae, bryophytes and lichens.</li><li>➤ Microscopic identification of algae, bryophytes and lichens.</li></ul>

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## UNIT I

**Algae:** General characters, Classifications (Fritsch) upto classes. Diverse Habitat. Range of thallus structure. Reproduction (Vegetative, Asexual, Sexual). Types of the life cycle. Type studies of Cyanophyceae- Nostoc, Oscillatoria, Chlorophyceae- *Chara*; Rhodophyceae-*Polysiphonia*.

**Fungi:** General characteristics; Thallus organization; types of fruiting bodies, Cell wall composition; Heterokaryosis and Parasexuality; Nutrition; Classification (*Alexopoulos*); reproduction, economic importance. Type studies: Oomycetes *Albugo* Zygomycota: *Rhizopus*, Basidiomycota: *Agaricus*.

**Lichens-** General characters, habitat, morphology and reproduction.

15 hrs

## UNIT II

**Bryophytes:** General characters, Origin, and evolution of Bryophyta. Classification (Rothmaler), Habitat, Range of thallus structure, Reproduction (Vegetative and Sexual), Alternation of generations and Economic importance. Study of Morphology, Anatomy, Reproduction, Gametophytes and sporophytes of *Marchantia*, *Anthoceros* and *Funaria*.

15

hrs

## UNIT III

**Pteridophytes:** General characters of Pteridophytes, affinities with Bryophytes & Gymnosperms, classification, economic importance, study of life histories of fossil Pteridophytes – *Rhynia*. Type studies Life histories of *Selaginella*- (Heterospory and seed habit) *Marsilea*. Stellar System in Pteridophytes

15 hrs

## UNIT IV

**Gymnosperms:** General characters, classification, Gymnosperms: Type studies Life histories of *Cycas* and *Ephedra* Economic importance of gymnosperms.

**Angiosperms:** General characters, Differences between Monocotyledons and Dicotyledons, Typical life cycle of Angiosperm.

15 hrs

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### Suggested Laboratory Exercises:

- Visit Local Garden /field study of plants
- Study of anatomy by making suitable temporary slides and study of permanent slides of *Chara, Vaucheria, Ectocarpus, Polysiphnia* (vegetative and reproductive).
- Lichens: Study of growth forms of lichens (crustose, foliose and fruticose)
- *Rhizopus*: study of asexual stage from temporary mounts and sexual structures through permanent slides.; *Agaricus*: Peziza, Specimens of button stage and full grown mushroom; sectioning of gills of *Agaricus*.
- **Bryophytes**- morphology of vegetative and reproductive stages of *Marchantia*, *Anthoceros* and *Funaria*.
- **Pteridophytes**- study of vegetative and reproductive stages of *Selaginella*- (Heterospory and seed habit), *Equisetum*, *Marsilea*
- Study of Vegetative and reproductive stages of *Cycas Pinus and Ephedra* using temporary and permanent slides.
- Study of monocot and dicot flowers and seeds.

### Suggested Readings:

- Alexopoulos, C.J. and Mims, C.W.: Introductory Mycology, John Wiley and Sons, New York, 2000
- Dube, H.C. :Fungi, Rastogi Publication, Meerut, 1989.
- Vashista, B.R. Botany for Degree Students -Fungi, S. Chand & Co., New Delhi, 2001.
- Gilbert, M. Smith: Cryptogamic Botany, Vol. I & II (2nd Ed.) Tata McGraw Hill. Publishing Co., Ltd., New Delhi, 1985.
- Kumar, H.D.: Introductory Phycology, Affiliated East—West Press, Ltd. New York, 1988.
- Puri. P.: Bryophytes, Atmaram & Sons. Delhi, Lucknow, 1985.
- Aneja, K.R.: Experiments in Microbiology, Plant Pathology and Biotechnology New Age International (P) Ltd., Publishers, New Delhi 2003.
- Pandey BP(2022) Algae, Bryophytes and Lichens, S Chand Publication

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**BOT-UG-CC02**

**Cell biology, Molecular Biology and Genetics**

**Objectives**

- To understand the structural organization of cells.
- To understand functions of organelles in the cell.
- To differentiate between plant and animal cells and to analyse different stages of mitosis and meiosis
- To understand Mendel laws.
- To understand functions genes, linkage and crossing over.

**Course Outcomes:**

At the completion of the course, the student would be able to develop

<b>BOT A03</b>	
<b>Cognitive level</b>	<b>Course outcome</b>
1. Understanding	<ul style="list-style-type: none"><li>➤ The functions and structural properties of different cells.</li><li>➤ Learn, understand and develop skill and hands on training in basics of cell biology and genetics.</li><li>➤ Function of genes, linkage and crossing over.</li><li>➤ To interpret genetics of a large group of population.</li></ul>
2. Memorizing	<ul style="list-style-type: none"><li>➤ The structural and functional aspects of cellular organelles.</li><li>➤ Human chromosomes and organization of chromosomes.</li><li>➤ Differentiation between linkages, crossing over, allelic interactions.</li><li>➤ Mendel's laws of genetics.</li></ul>
3. Applying	<ul style="list-style-type: none"><li>➤ Variations in functions of cell organelles.</li><li>➤ Concept of cell cycle, abnormalities, cell membrane, cell-cell interactions.</li><li>➤ Possibilities of mutations and mutagens.</li></ul>

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JAIPUR  
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## UNIT I

**Ultrastructure of Cell and Cell Organelles:** Eukaryotic and Prokaryotic cell structure; Ultrastructure and functions of different cell organelles (Cell wall, Plasma membrane, Nucleus, Mitochondria, Chloroplast, Ribosome, Peroxisomes, Lysosome, Golgi bodies and Endoplasmic Reticulum); Basic idea of Mitochondrial and Chloroplast genome. 15 hrs

## UNIT II

**Chromosome organization:** Chromosome Morphology, Specialized types of chromosomes: Polytene chromosomes. **Cell Division:** Cell cycle; Mitosis and Meiosis, **Chromosomal aberrations in human and ploidy in plants:** Deletion, Duplication, Translocation, Inversion, Aneuploidy and Polyploidy. **Mutations:** Spontaneous and induced Mutations, Physical and Chemical mutagens. 15 hrs

## UNIT III

**Gene and DNA:** Concept of Genome, Gene. **Genetic material:** DNA as genetic material (Griffith's transformation experiment); structure of DNA (Watson and Crick Model); Structure and function of different types of RNA ( rRNA, m RNA, tRNA). **DNA replication:** Mechanisms of Eukaryotes DNA replication: Initiation, Elongation and Termination; Leading and lagging strands, Okazaki fragments. **Transcription:** initiation, elongation and termination. **Translation:** initiation, elongation and termination in Eukaryotes Genetic code 15 hrs.

## UNIT IV

**Genetic inheritance:** Mendel's laws of inheritance and their exceptions; allelic (incomplete dominance, co-dominance, lethality) and non-allelic interactions (complementary genes, epistasis and duplicate genes); Multiple allelism (ABO blood groups in men); Quantitative inheritance (Grain color in wheat). **Cytoplasmic inheritance:** Plastid inheritance (different types of leaves in *Mirabilis jalapa*); Mitochondrial inheritance (Cytoplasmic male sterility in plants). 15 hrs

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### Suggested Laboratory Exercises:

- Study of cell structure from Onion,
- Study of cyclosis in *Tradescantia* spp.
- Study of plastid for pigment distribution in *Lycopersicom*, *Cassia* and *Capsicum*.
- Study of electron microphotographs of Prokaryotic cells for various cell organelles.
- Study of electron microphotographs of virus, bacteria and eukaryotic cells for comparative study of cellular organization.
- Study of different stages of mitosis and meiosis in root-tip cells and flower buds respectively of onion.
- To solve genetic problems based upon Mendel's laws of inheritance: Monohybrid, Dihybrid, Back cross and test cross.
- Permanent slides/photographs of different stages of mitosis and meiosis, polytene chromosome

### Suggested Reading

- Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., & Walter, P. (2014). **Molecular Biology of the Cell** (6th Ed.). New York: Garland Science
- Cooper, G. M., and Hausman, R. E. (2013). **The Cell: A Molecular Approach** (6th Ed.). Washington: ASM ; Sunderland.
- Karp, G. **Cell and Molecular Biology. Concepts and experiments**. John Harris, D., Wiley & sons, New York
- Lodish, H. F., Berk, A., Kaiser, C. A., Krieger, M., Bretscher, A., Ploegh, H., Aman, A., Martin, K. (2016). **Molecular Cell Biology** (8th Ed.). New York: W. H. Freeman
- Gupta P. K. **Cell and Molecular Biology** 2018. 5<sup>th</sup> edition Rastogi Publication India.
- Hartl, D. L., & Jones, E. W. (1998). **Genetics: Principles and Analysis**. Sudbury, MA: Jones and Bartlett.
- Pandey BP (2022) **Cell Biology and Genetics**, S Chand Publication

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## Multidisciplinary courses

### 1. Herbal Medicine and Human Health

#### Course Objective

To introduce students to complementary and alternative medicine

To explore uses of plants as medicine ranging from traditional indigenous approach for treating ailments to modern pharmaceuticals

To inculcate awareness about the rich diversity of medicinal plants in India.

#### Unit I

Scope and importance of medicinal plants in the traditional systems of medicine and modern medicine. Importance of preventive and holistic healing in the Indian traditional systems of medicine. **Ayurveda**: History, origin, fundamental doctrine and concepts of Panchamahabhutas, Saptadhatu and Tridosha relation to health and diseases.

#### Unit II

Therapeutic and pharmaceutical uses of important plants used in the Ayurveda, Siddha and Unani system of medicine. Plants used by the tribals: a) Food plants b) intoxicants and beverages c) Resins and oils and miscellaneous uses. Medico-ethnobotanical sources in India; Significance of the following plants: a) *Azadirachta indica* b) *Ocimum sanctum* c) *Vitex negundo*. d) *Pongamia pinnata* e) *Cassia auriculata* f) *Indigofera tinctoria* g) *Prosopis cineraria* h) *Acacia nilotica* i) *Ficus religiosa*.

#### Unit III

Nutraceuticals and polyherbal formulations. Plants used for the treatment of hepatic disorders, cardiac diseases, infertility, diabetes, blood pressure, cancer and skin diseases. Role of AYUSH, NMPB and AIIA in the promotion of medicinal plants. Evaluation and Standardization of crude drugs. Fundamentals of Pharmacognosy. Organoleptic, microscopic and phytochemical evaluation of plant drugs.

#### Unit IV

Conservation of Endangered and Endemic Medicinal plants. Red Data List Criteria. In situ Conservation: Biosphere Reserves, National Parks, Sacred Groves. Ex-situ conservation: Botanic Gardens, National Gene Banks, Plant cell, tissue, and Organ culture, Cryopreservation. Role of NBPGR, CIMAP, JNTBGRI and RRL.

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## 2. Plant Biodiversity and Conservation

### Unit I

**Plant diversity and its scope-** Genetic diversity, Species diversity, Plant diversity at the ecosystem level, Agro-biodiversity and cultivated plant taxa, wild taxa. **Values and uses of Biodiversity:** Ethical and aesthetic values, Precautionary principle, Methodologies for valuation, Uses of plants, Uses of microbes.

### Unit II

**Loss of Biodiversity:** Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity, Loss of agrobiodiversity, Projected scenario for biodiversity loss, Management of Plant Biodiversity: Organizations associated with biodiversity management- IUCN, UNEP, UNESCO, WWF, NBPGR; Biodiversity legislation and conservations, Biodiversity information management and communication.

### Unit III

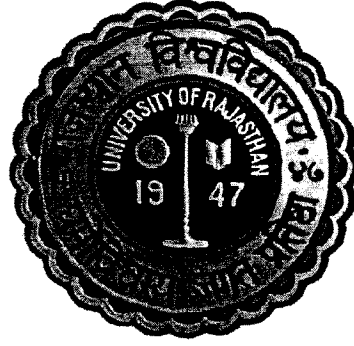
**Conservation of Biodiversity:** Conservation of genetic diversity, species diversity and ecosystem diversity, In situ and ex situ conservation, Social approaches to conservation, Biodiversity awareness programmes, Sustainable development.

### Unit IV

Role of plants in relation to Human Welfare; a) Importance of forestry their utilization and commercial aspects b) Avenue trees, c) Ornamental plants of India. d) Alcoholic beverages through ages. Fruits and nuts: Important fruit crops their commercial importance. Wood and its uses.

12/1/2015  
Dy. Registrar (Acad.)  
University of Rajasthan  
JAIPUR

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# University of Rajasthan Jaipur

## SYLLABUS

(Three/Four Year Under Graduate Programme in Science)

I & II Semester

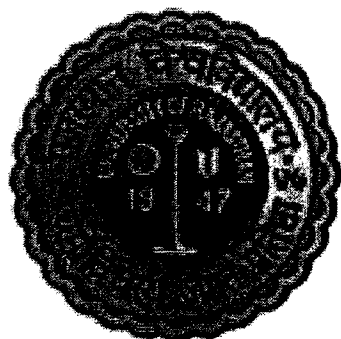
Examination-2023-24

As per NEP - 2020

*Pj / Tas*  
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University of Rajasthan  
JAIPUR

*2024*

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**UNIVERSITY OF RAJASTHAN**

**JAIPUR-302004**

**FOUR-YEAR UNDERGRADUATE PROGRAMME  
FACULTY OF SCIENCE**

**Programme: UG0802/03 – Four Year Bachelor of Science  
B.Sc. Pass Course (Bio and Maths Group)**

**Subject/Discipline – Chemistry**

**(Syllabus as per NEP-2020 and Choice Based Credit System)**

**(Academic Year 2023-24 onwards)**

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University of Rajasthan

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### PROGRAMME PREREQUISITES/ELIGIBILITY

12<sup>th</sup> standard pass in science from CBSE, RBSE or a recognized board of education.

### PROGRAMME OUTCOMES (POs)

1. **Basic Knowledge of Science:** Students will get acquainted with the knowledge of chemical science which helps them to understand various phenomena happening in their surroundings.
2. **Dealing with untoward incidence:** The knowledge of science will help them to deal with untoward incidents in the neighborhood. For example, sudden explosion by chemicals and excessive misuse of unwanted substances can be managed with basic knowledge of chemistry and environmental pollution can be controlled by the students by spreading awareness in the society about the harmful pollutants.
3. **Proficiency in Scientific Principles:** Students will demonstrate a strong understanding of fundamental scientific principles in chemistry and they will be able to apply these principles to analysis and solution.
4. **Quantitative and Computational Skills:** Students will acquire proficiency in quantitative, analytical and computational principles. They will be able to perform calculations, manipulate mathematical expressions, and use computational tools to solve scientific problems.
5. **Experimental and Laboratory Skills:** Students will gain practical experience conducting experiments, using laboratory apparatus and equipment, and performing experimental data analysis. They will understand the importance of accurate measurement, data interpretation, and documentation.
6. **Employability:** Students will get employment in the following sectors:
  - The students can go in chemical and related industries viz. Pharmaceutical, Agrochemicals, Metallurgical, Fertilizer, Biofertilizer, Organic fertilizer, Textile, Food ceramic, Cement, Petrochemicals, Pesticides Plastics and Polymers etc.
  - The students can go for Ballistics, Forensic Lab, Bio Warfare Labs, CBIR Labs, DRDO, Industrial Chemistry etc.
  - They can opt a career in Petroleum, Soil Testing Labs environment conservation, preservation, and as Analytical Chemist, Chemical Product Officer, Radiologist and Toxicologist.
7. **Development of communication skills:** Students will develop effective oral and written communication skills. They will be able to clearly and concisely communicate scientific ideas, principles and experimental results to both technical and non-technical audiences.
8. **Development of Teamwork and Collaboration Skills:** Students will develop teamwork and collaboration skills through group projects, laboratory work, and research activities. They will be able to work effectively in diverse teams and contribute to collective goals.

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20/04

## SEMESTER-WISE PAPER TITLES WITH DETAILS

UG0802/03 – Four Year Bachelor of Science (B.Sc. Pass Course)						
Subject/Discipline - Chemistry						
Credit Framework for Four Year Bachelor of Science under NEP – 2020						
Academic Session 2023-2024						
S. No.	Semester	Course Code	Course Title	Credits		Marks
				L	P	
1.	I	CHM-51T-101	Structure-bonding, Mathematical concept and States of matter	4	0	100
2.	I	CHM-51P-102	Chemistry Lab-I	0	2	50
3.	II	CHM-52T-103	Reaction mechanism, Stereochemistry, Aromatic hydrocarbon and Chemical kinetics.	4	0	100
4.	II	CHM-52P-104	Chemistry Lab-II	0	2	50

### Scheme of Examination:

**1 credit = 25 marks for examination/evaluation**

#### Notes:

Continuous assessment, in which sessional work and the terminal examination will contribute to the final grade. Each course in Semester Grade Point Average (SGPA) has two components- Continuous assessment (20% weightage) and (End of Semester Examination) EoSE (80% weightage).

1. Sessional work will consist of class tests, mid-semester examination(s), homework assignments, etc., as determined by the faculty in charge of the courses of study.
2. Each Paper of EoSE shall carry 80% of the total marks of the course/subject. The EoSE will be of 3 hours duration.
  - Part-A of the paper shall have multiple questions of equal marks. This first question shall be based on knowledge, understanding and applications of the topics/texts covered in the syllabus.
  - Part B of the paper shall consist of 4 questions with an internal choice of each. The four questions will be set with one from each of the units with internal choice. Third to fourth questions shall be based on applications of the topics/texts covered in the syllabus (60% weightage) and shall involve solving Problems (40% weightage) if applicable.
3. 75% Attendance is mandatory for appearing in EoSE.
4. To appear in the EoSE examination of a course/subject student must appear in the mid-semester examination and obtain at least a C grade in the course/subject.

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University of Jammu  
JAMMU  
*Roy*

5. Credit points in a Course/Subject will be assigned only if, the student obtains at least a C grade in midterm and EoSE examination of a Course/Subject.

## Syllabus: UG0802/03 - B.Sc. (Pass Course)

### CHEMISTRY

#### Semester – I (2023-2024)

Course Code	Course Title	Duration	Maximum Marks	Minimum Marks
CHM-51T-101	Structure-bonding, Mathematical concept and States of matter	MT - 1 Hr. EoSE - 3 Hrs.	MT - 20 EoSE - 80	MT - 08 EoSE - 32
CHM-51P-102	Chemistry Lab-I	MT - 2 Hrs. EoSE - 4 Hrs.	MT - 10 EoSE - 40	MT - 04 EoSE - 16
Prerequisites/Eligibility		12 <sup>th</sup> standard pass in science from CBSE, RBSE or a recognized board of education.		
<p><b>Course Objectives:</b> The aim of this course is to provide students with a theoretical understanding of the basic constituents of matter; atoms, ions and molecules in terms of their electronic structure and chemical bonding of these are to be explained by applying basic quantum chemistry. The objective of this course is to explain the basic concepts of mathematics and to explain the structural differences and transformations between states of matter. In addition, the laboratory course is designed to provide students with practical experience in basic qualitative analytical techniques, the use of laboratory techniques, and the determination of physical properties of matter.</p>				
<p><b>Course Outcomes:</b> By the end of this course, students will have a clear understanding of various concepts related to atomic and molecular structure, chemical bonding, mathematical concepts, and states of matter. Students will also have practical experience in calibration of glassware, qualitative analysis of radicals, identification of functional groups in organic compounds, determination of various physical properties of substances, crystallization and preparation of standard solutions of different concentrations.</p>				

## Syllabus

**CHM-51T-101: Structure-bonding, Mathematical concept and States of matter.**  
(4 Hrs./week)

#### Duration

1 Hour  
3 Hours

#### Maximum Marks

Midterm – 20 Marks  
EoSE – 80 Marks

#### Minimum Marks

Midterm – 08 Marks  
EoSE – 32 Marks

### Unit-I

**Ionic Solids:** General characteristics of ionic bonding, Ionic structures, radius ratio effect and coordination number, limitation of radius ratio rule, Lattice enthalpy and Born-Landé equation for calculation of Lattice Enthalpy (no derivation), Born-Haber cycle and its applications, Solvation enthalpy and solubility of ionic solids, polarizing power and polarizability, Fajan's rule. lattice defects, semiconductors.

**Metallic bond:** Free electron, valence bond and band theories.

**Weak Interactions:** Hydrogen bonding, Van der Waals forces. 15 Lecture

### Unit-II

**Covalent Bond:** Valence bond theory and its limitations, Directional character, Hybridization. Valence shell electron pair repulsion (VSEPR) theory to  $\text{NH}_3$ ,  $\text{H}_3\text{O}^+$ ,  $\text{SF}_4$ ,  $\text{ClF}_3$ ,  $\text{ICl}_2^-$ ,  $\text{H}_2\text{O}$ .

**Molecular Orbital Theory:** LCAO method, bonding, nonbonding and antibonding MOs and their characteristics for combinations of atomic orbitals, MO treatment of homonuclear and heteronuclear (CO and NO) diatomic molecules. Comparison of VB and MO approaches.

**Multicenter bonding** in electron deficient molecules, bond strength and bond energy, ionic character in covalent compounds, calculation of percentage ionic character from dipole moment and electronegativity difference. 15 Lecture

### Unit-III

**Mathematical Concepts:** Logarithmic relations, curve sketching, linear graphs and calculations of slopes, differentiation of functions like  $k_x$ ,  $e^x$ ,  $x^n$ ,  $\sin x$  and  $\log x$ ; maxima and minima, partial differentiation and reciprocity relations, integration of some useful/relevant functions; permutations and combinations, factorials, probability. Matrices and Determinant.

**Liquid State:** Intermolecular forces, structure of liquids (a qualitative description). Structural differences between solids, liquids and gases. Liquid crystals: Difference between liquid crystal, solid and liquid.

**Solid State:** Definition of space lattice, unit cell.

Laws of crystallography- (i) Law of constancy of interfacial angles (ii) Law of rationality of indices (iii) Law of symmetry. Symmetry elements in crystals.

Basic concept of X-ray diffraction by crystals. Derivation of Bragg's equation. Determination of crystal structure of NaCl and CsCl (Laue's method and powder method.). Defects in solids.

15 Lecture

### Unit-IV

**Gaseous State:** Postulates of kinetic theory of gases, deviation from ideal behavior, van der Waals equation of state.

**Critical Phenomenon:** PV isotherms of real gases, continuity of states, the isotherms of van der Waals equation, relationship between critical constants and van der Waals constants, the law of corresponding states, reduced equation of state.

**Molecular Velocities:** Root mean square, average and most probable velocities. Qualitative

discussion of the Maxwell's distribution of molecular velocities, collision number, mean free path and collision diameter. Liquification of gases (based on Joule-Thomson effect.)

**Colloidal State:** Definition of colloids, classification of colloids.

Solids in liquids (sols): properties - kinetic, optical and electrical, stability of colloids. Protective action, Hardy-Schulze law, gold number.

Liquids in solids (gels): classification, preparation and properties, inhibition, general applications of colloids.

Liquids in liquids (emulsions): types of emulsions, preparation. Emulsifier.

15 Lecture

**Suggested Books and References:**

1. Lee, J.D. Concise Inorganic Chemistry Wiley, India.
2. Housecroft, Catherine E. & Sharpe, Alan G. Inorganic Chemistry, Pearson Education Ltd.
3. Tuli, G. D. Advanced Inorganic Chemistry, S. Chand, New Delhi.
4. Satya Prakash Advanced Inorganic Chemistry, S. Chand, New Delhi.
5. Adams, D. M. Inorganic Solids – Introduction to Concepts in Solid-state Structural Chemistry, John Wiley, London.
- ⇒ 6. Puri, Sharma & Kalia, Principles of Inorganic Chemistry, S. Chand, New Delhi.
7. Puri, B. R., Sharma, L. R. & Pathania, M. S. Principles of Physical Chemistry, Vishal Publishing Co.
8. Gurdeep Raj, Advanced Physical Chemistry, Goel Publishing House.
9. Atkins, W. Physical Chemistry, Oxford University Press.
10. Silby, R. J. & Alberty, R. A. Physical Chemistry, John Wiley & Sons.
11. Barrow, G.M. Physical Chemistry, Tata McGraw-Hill.
12. Kapoor, K. L. A Textbook of Physical Chemistry, (Volume I) Macmillan India Ltd.

## Syllabus

**CHM-51P-102: Chemistry Lab I**

**(4 Hrs./week)**

Duration	Maximum Marks	Minimum Marks
2 Hours	Midterm – 10 Marks	Midterm – 04 Marks
4 Hours	EoSE – 40 Marks	EoSE – 16 Marks

**Inorganic Chemistry**

**10 marks**

Separation and identification of six radicals (3 cations and 3 anions) in the given inorganic mixture including special combinations.

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## Organic Chemistry

### Laboratory Techniques

3 marks

- (a) Determination of melting point (naphthalene, benzoic acid, urea, etc.); boiling point (methanol, ethanol, cyclohexane, etc.): mixed melting point (urea-cinnamic acid, etc.).  
(b) Crystallization of phthalic acid and benzoic acid from hot water, acetanilide from boiling water, naphthalene from ethanol etc.; Sublimation of naphthalene, camphor, etc.

### Qualitative Analysis

7 marks

Identification of functional groups (unsaturation, phenolic, alcoholic, carboxylic, carbonyl, ester, carbohydrate, amine, amide, nitro and hydrocarbon) in simple organic compounds (solids or liquids) through element detection (N, S and halogens).

## Physical Chemistry

### Viscosity and Surface Tension:

10 marks

- a) To determine the viscosity/surface tension of a pure liquid (alcohol etc.) at room temperature. (Using the Ostwald viscometer/stalagmometer).  
b) To determine the percentage composition of a given binary mixture (acetone and ethyl methyl ketone) by surface tension method.  
c) To determine the percentage composition of a given mixture (non-interacting systems) by viscosity method.  
d) To determine the viscosity of amyl alcohol in water at different concentration and calculate the excess viscosity of these solutions.

### Viva voce

5 marks

### Practical Record

5 marks

## Syllabus: UG0802/03-B.Sc. (Pass Course)

# CHEMISTRY

## Semester – II (2023-2024)

Course Code	Course Title	Duration	Maximum Marks	Minimum Marks
CHM-52T-103	Reaction mechanism, Stereochemistry, Aromatic hydrocarbons and Chemical kinetics.	MT - 1 Hr. EoSE - 3 Hrs.	MT - 20 EoSE - 80	MT - 08 EoSE - 32
CHM-52P-104	Chemistry Lab-II	MT - 2 Hrs. EoSE - 4 Hrs.	MT - 10 EoSE - 40	MT - 04 EoSE - 16

Course Objectives: The objective of this course is to provide students with a theoretical understanding of the types of organic reactions and their mechanisms, generation and stability

of various intermediates, determination of reaction mechanism, stereochemistry of organic compounds with an understanding of the enantiomers, diastereomers, D/L and R/S nomenclature. The aim of this course is to explain the structure and reactivity of aromatic hydrocarbons, and to explain the order and molecularity of the reactions, the rate law and order of reactions determination. In addition, the laboratory course is designed to provide students with practical experience in basic quantitative analytical techniques including volumetric analysis, qualitative analytical techniques, and the determination of kinetic parameters of reactions.

**Course Outcomes:** By the end of this course, students will have a clear understanding of drawing logical and detailed reaction mechanisms for various fundamental reactions of aliphatic and aromatic hydrocarbons, methods of determining the reaction mechanisms, classifying the molecules as chiral or achiral, determining the D/L and R/S nomenclature of stereoisomers and identifying the formation of racemic mixture or optically active compounds during the reactions. Students will also have an understanding about order and molecularity of reactions, rate law and methods determining of order and kinetic parameters of reactions. Students will also have practical experience in quantitative analytical techniques including volumetric analysis, identification of organic compounds by determination of functional groups, determination of order and rate constant of various reactions.

## Syllabus

**CHM-52T-103: Reaction mechanism, Stereochemistry, Aromatic hydrocarbons and Chemical kinetics.**  
(4 Hrs./week)

Duration	Maximum Marks	Minimum Marks
1 Hour	Midterm – 20 Marks	Midterm – 08 Marks
3 Hours	EoSE – 80 Marks	EoSE – 32 Marks

### Unit-I

**Introductory Concept and Mechanism of Organic Reactions:** IUPAC nomenclature of organic compounds, Dipole moment, Inductive and field effects, electromeric effect, conjugation, resonance and resonance energy, hyperconjugation. Homolytic and heterolytic bond cleavage. Type of reagents, electrophiles and nucleophiles. Reactive intermediates - carbocations, carbanions, free radicals, carbenes, arynes and nitrenes (generation, reactions and stability). Types of organic reactions. Markovnikov's rule, Anti-Markovnikov's rule, Saytzeff's rule and Hofmann elimination. Energy considerations. Methods of determination of reaction mechanism (product analysis, intermediates, isotope labelling, kinetic and stereochemical studies), isotope effects.

15 Lecture

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## Unit-II

**Stereochemistry of Organic Compounds:** Concept of isomerism, Types of isomerism, Difference between configuration and conformation, Flying wedge and Fischer projection formulae.

**Optical Isomerism:** Elements of symmetry, molecular chirality, enantiomers, stereogenic centre, optical activity. Properties of enantiomers, chiral and achiral molecules with two stereogenic centres. Diastereomers, threo and erythro isomers, meso compounds. Resolution of enantiomers. Inversion, retention and racemization (with examples).

Relative and absolute configuration, sequence rules, D / L and R / S systems of nomenclature.

**Geometrical Isomerism:** Determination of configuration of geometric isomers - cis / trans and E / Z systems of nomenclature. Geometrical isomerism in oximes and alicyclic compounds.

**Conformational Isomerism:** Newman projection and Sawhorse formulae, Conformational analysis of ethane, *n*-butane and cyclohexane. 15 Lecture

## Unit-III

**Arenes and Aromaticity:** Nomenclature of benzene derivatives. The aryl group, aromatic nucleus and side chain. Structure of benzene: molecular formula and Kekule structure. Stability and carbon-carbon bond lengths of benzene, resonance structure, MO' diagram.

Aromaticity: Huckel rule, aromatic ions-three to eight membered.

Aromatic electrophilic substitution: General pattern of the mechanism, role of sigma and pi complexes. Mechanism of nitration, halogenation, sulphonation, mercuration, chloromethylation and Friedel crafts reactions. Energy profile diagrams. Activating and deactivating substituents. Directive influence orientation and ortho/para ratio. Side chain reactions of benzene derivatives. Birch reduction. 15 Lecture

## Unit- IV

**Chemical Kinetics:** Chemical kinetics and its scope, rate of a reaction, factors influencing the rate of a reaction: concentration, temperature, pressure, solvent, light, catalyst. Concentration dependence of rates, mathematical characteristics of simple chemical reactions - zero order, first order, second order and pseudo-order; half-life and mean-life.' Determination of the order of reaction - differential method, method of integration, method of half-life period and isolation method.

Radioactive decay as a first order phenomenon.

Experimental methods of chemical kinetics: conductometric, potentiometric, optical methods, (polarimetry) and spectrophotometric method. Theories of chemical kinetics. Effect of temperature on rate of reaction, Arrhenius equation, concept of activation energy.

Simple collision theory based on hard sphere model transition state theory (equilibrium hypothesis). Expression for the rate constant bases on equilibrium constant and thermodynamic



aspects.

15 Lecture

**Suggested Books and References:**

1. Gupta, S. S. Organic Chemistry, Oxford University Press.
2. Ahluwalia, V. K. Organic Reaction Mechanisms, Narosa Publishing House, New Delhi.
3. Agarwal, O. P. Organic Chemistry – Reactions and Reagents: Covering Complete Theoretical Organic Chemistry, Goel Publishing House, Meerut.
4. Morrison R. T. & Boyd R. N. Organic Chemistry, Prentice Hall.
5. Finar, I. L. Organic Chemistry (Vol. I & II) ELBS.
6. Bahl A. & Bahl B. S. Advanced Organic Chemistry, S. Chand.
7. Jain, M.K. & Sharma, S.C. Modera Organic Chemistry, Vishal Publishing Co.
8. March, J. & Smith, M. B. March's Advanced Organic Chemistry: Reactions, Mechanisms and Structure, Wiley.
9. Ahluwalia, V. K. Stereochemistry of Organic Compounds, Springer.
10. Puri, B. R., Sharma, L. R. & Pathania, M. S. Principles of Physical Chemistry, Vishal Publishing Co.
11. Gurdeep Raj, Advanced Physical Chemistry, Goel Publishing House.
12. Kapoor, K. L. A Textbook of Physical Chemistry, (Volume 5) Macmillan India Ltd.

## Syllabus

**CHM-52P-104: Chemistry Lab II**

**4 Hrs./week**

Duration	Maximum Marks	Minimum Marks
2 Hours	Midterm – 10 Marks	Midterm – 04 Marks
4 Hours	EoSE – 40 Marks	EoSE – 16 Marks

**Inorganic Chemistry**

**Volumetric Analysis**

**10 marks**

- (a) Determination of acetic acid in commercial vinegar using NaOH
- (b) Determination of alkali content in antacid tablet using HCl
- (c) Estimation of calcium content in chalk as calcium oxalate by permanganometry.
- (d) Estimation of hardness of water by EDTA
- (e) Estimation of ferrous and ferric by dichromate/permanganate method.
- (f) Estimation of copper using thiosulphate by iodometric method.

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**Organic Chemistry**

**Qualitative Analysis**

**10 marks**

Identification of organic compound through the functional group analysis, determination of melting point, boiling point and specific test.

**Physical Chemistry**

**Chemical Kinetics:**

**10 marks**

- To determine the specific reaction rate of the hydrolysis of methyl acetate/ ethyl acetate catalyzed by hydrogen ions at room temperature.
- To study the effect of acid strength on the hydrolysis of an ester.
- To compare the strengths of HCl and H<sub>2</sub>SO<sub>4</sub> by studying the kinetics of hydrolysis of ethyl acetate.
- To study kinetically the reaction rate of decomposition of iodide by H<sub>2</sub>O<sub>2</sub>.

**Viva voce**

**5 marks**

**Practical Record**

**5 marks**

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