Sr. No.	Programme	Name of Course	Course ID	Type of Course	Credits (Theory)	Credits (Practical)	Total Credits	Theory Ext Marks	Theory Int Marks	Total Theroy Marks	Practical Ext Marks	Practical Int Marks	Total Practical Marks	Total marks
1	M.A. Economics	Entrepreneurship	241/ECO/AE401	Ability Enhancement Course	2	0	2	35	15	50	0	0	0	50
2	M A Hindu Studies 4th Sem	व्यावहारिक संस्कृत-3	251/HS/AE401	Ability Enhancement Course	1	1	2	30	10	30	0	10	10	50
3	MA Sanskrit 4th Sem	व्यावहारिक संस्कृत-3	251/SKT/AE401	Ability Enhancement Course	1	1	2	30	10	30	0	10	10	50
4	MA. Hindi	हिंदी भाषा में रचनात्मक अभिव्यक्ति	241/HIN/AE401	Ability Enhancement Course	2		2	35	15	50				50
5	M.Sc. Chemistry	Advanced Physical Chemistry	241/CHE/AE401	Ability Enhancement Course	2	0	2	35	15	50	0	0	0	50
6	M.Sc. Chemistry	Advanced Organic Chemistry	241/CHE/AE402	Ability Enhancement Course	2	0	2	35	15	50	0	0	0	50
7	M.Sc. Chemistry	Advanced Inorganic Chemistry	241/CHE/AE403	Ability Enhancement Course	2	0	2	35	15	50	0	0	0	50
8	M.A. History	Art and Science in History Writing	241/HIS/AE401	Ability Enhancement Course	2	0	2	35	15	50				
9	MBA BA 2nd SEM	Corporate Leadership & Networking Skills	251/MBABA/AE201	Ability Enhancement Course	2	-	2	35	15	50	-	-	-	50
10	MBA BA 4th sem	Data Visulaization with Power BI	241/MBABA/AE401	Ability Enhancement Course	2	-	2	35	15	50	-	-	-	50
11	MBA General	Business Negotiation Skills	241/MBA/AE401	Ability Enhancement Course	2	-	2	35	15	50	-	-	-	50
12	Master of Public Health	Communication and training in Health	241/MPH/AE401	Ability Enhancement Course	2		2	35	15	50				50
13	M.A. English	Essentials of Writing Skills	241/ENG/AE401	Ability Enhancement Course	2	0	2	35	15	50				
14	M.Sc. (Physics)	Introduction to Astrophysics	241/PHY/AE401	Ability Enhancement Course	2	0	2	35	15	50	0	0	0	50

241/ECO/AE401

AEC	Entrepreneurship

Max. Marks: 50 **Written Exam: 35 (2 Hours)**
Credits: 2 **Internal Assessment: 15**

Note For the paper Setter

1. Five Questions will be set in all and students will be required to attempt 3 questions.
2. Question No. 1 will be compulsory and will consist of 5 short answer type questions of 3 marks spread over the entire syllabus (3x5=15 marks).
3. From the remaining four questions, students will attempt 1 out of 2 questions from each of the two units (10 marks each)

Course Learning Outcomes: After completing this course, the learner will be able to-
CLO 1: Understand the Concept of Entrepreneurship and recognize the essential traits and competencies required for successful entrepreneurship
CLO 2: Analyze the Factors Influencing Entrepreneurial Emergence and Growth
CLO 3: Evaluate the concept of Sustainable Entrepreneurship
CLO 4: Compare and contrast the entrepreneurial and managerial mindsets

UNIT–I

Entrepreneurship: Concept, Types, traits of successful entrepreneurs (along with class discussion on success stories of few Indian Entrepreneurs – Nykaa, Oyo rooms, Paytm, Ola cabs, Flipkart etc.), factors impacting emergence of entrepreneurship, stages of entrepreneurial growth and development, barriers to Entrepreneurship,
Sustainable Entrepreneurship- its principles and barriers.

UNIT–II

Entrepreneurial decision-making process, Factors influencing entrepreneurial decisions, Process of setting up a new business enterprise, Government Schemes/ Programs for entrepreneurs in India in last one decade, Importance of entrepreneurs in circular economy, Role of entrepreneurship in economic development,

Reading List:

- Desai Vasant, Dynamics of Entrepreneurial Development and Management, Himalaya Publishing House
- Jerome Katz and Richard Green, Entrepreneurial Small Business, McGraw Hill
- Jain Rajiv. Planning a Small Scale Industry. A Guide to Entrepreneurs. Delhi; S.S. Books.
- Khanka S.S., Entrepreneurship Development, S. Chand Publishing
- Kumar, S A. Entrepreneurship in Small Industry. New Delhi. Discovery.
- McClelland, D C and Winter, W G. Motivating Economic Achievement. New York; Free Press.
- Rajeev Roy, Essentials of Entrepreneurship, Oxford University Press
- Charantimath Poornima M. Entrepreneurship Development and Small Business Enterprises, Pearson Education

- Robert Hisrich and Michael Peters and Dean Shepherd, Entrepreneurship, 11th Edition, 2020
- https://digest.myhq.in/top-10-government-schemes-for-startups-in-india/
- https://managemententhusiast.com/top-11-government-schemes-for-entrepreneurs-in-india-funding-benefits-and-opportunities/t

251/HS/AE401

AEC

Semester-IV

Course Code	Course Title	Course ID	L	T	P	L	T	P	Credits	MARKS				
			(Hrs)			Credits				TI	TE	PI	PE	Total
AEC	**व्यावहारिक संस्कृत-3**		1	-	2	1	-	2	2	10	30	10	-	50

पाठ्यक्रम विवरण:

पाठ्यक्रम का उद्देश्य विद्यार्थियों को संस्कृत भाषा में उन्नत स्तर की संवादात्मक, लेखन, पठन एवं श्रवण क्षमता से समृद्ध करना है। यह पाठ्यक्रम संस्कृत भाषा के व्यावहारिक प्रयोग पर केन्द्रित है, जिससे छात्र औपचारिक तथा अनौपचारिक स्थितियों में संस्कृत का सुगठित उपयोग कर सकें। विद्यार्थियों को संस्कृत में अनुच्छेद लेखन, संवाद प्रस्तुति, भाषण, तथा समाचार पठन का अभ्यास कराया जाएगा। यह स्तर पूर्ववर्ती दो स्तरों पर आधारित है तथा छात्रों को दैनिक जीवन के आधुनिक प्रसंगों में संस्कृत के व्यवहार में आत्मनिर्भर बनाने की दिशा में अग्रसर करता है।

पाठ्यक्रम उद्देश्य:

- विद्यार्थियों को संस्कृत में संवाद, लेखन एवं श्रवण की उन्नत क्षमता प्रदान करना।
- संस्कृत गद्य-पद्य के माध्यम से संप्रेषण कौशल का विकास करना।
- संस्कृत में अनुवाद, भाषण, वर्णन, अनुच्छेद लेखन आदि के माध्यम से व्यवहारिक दक्षता प्राप्त कराना।
- विद्यार्थियों को संस्कृत भाषा के व्यवहारिक प्रयोग में दक्ष बनाना।
- विद्यार्थियों को औपचारिक एवं अनौपचारिक प्रसंगों में संस्कृत में अभिव्यक्ति हेतु तैयार करना।
- संस्कृत में समाचार, भाषण, संवाद आदि के माध्यम से समसामयिक विषयों पर प्रस्तुति की क्षमता विकसित करना।
- संस्कृत के प्रति रुचि, आत्मविश्वास एवं निरंतर व्यवहारशीलता का विकास करना।

इकाई-1: संवाद कौशल (Conversation Skills)

- संस्कृत में दैनिक जीवन के उन्नत संवाद:
  - कार्यालय, पुस्तकालय, बैंक, बाज़ार, अस्पताल, यात्रा आदि
  - प्रश्नोत्तर शैली, आदान-प्रदान के वाक्य
  - औपचारिक एवं अनौपचारिक शैली में वार्तालाप

- श्रव्य सामग्री पर आधारित अभ्यास (संस्कृत ऑडियो क्लिप/कहानियाँ)

इकाई-2: लेखन अभ्यास (Writing Practice)

- अनुच्छेद लेखन (Paragraph Writing) - 100-150 शब्द
- पत्र लेखन - औपचारिक / अनौपचारिक
- सूचनाओं का लेखन (Notice Writing)
- बधाई/आमंत्रण/प्रार्थना-पत्र आदि का लेखन

इकाई-3: संस्कृत समाचार एवं संवाद (Contemporary Use of Sanskrit)

- संस्कृत में समाचार प्रस्तुति का प्रारंभिक अभ्यास
- आकाशवाणी/दूरदर्शन शैली में संवाद
- संस्कृत में भाषण देना: (1-2 मिनट का लघु भाषण)
- दैनिक समाचारों का संस्कृत अनुवाद (सरल)

मुख्य ग्रन्थ-

1. रचनानुवाद कौमुदी, डॉ. कपिलदेव द्विवेदी
2. संस्कृत वार्तालाप (Sanskrit Vartalap) – प्रो. श्यामसुंदर मिश्र
3. संस्कृत भाषा सीखें (Learn Sanskrit Language) – स्वामी श्रीचरण
4. संस्कृत व्यवहारकौशल (Sanskrit Vyavaharakoushal) – डॉ. गिरीश पाण्डेय
5. संस्कृत संवाद प्रबोधिनी (Sanskrit Samvad Prabodhini) – डॉ. विनोद कुमार
6. संस्कृत व्यावहारिक शिक्षा (Sanskrit Practical Education) – प्रो. रवि शंकर शर्मा
7. संस्कृत संवाद साधना (Sanskrit Samvad Sadhana) – स्वामी त्रिपुरसुंदरी
8. व्यवहारिक संस्कृत (Practical Sanskrit) – डॉ. रामकृष्ण शर्मा
9. **संवादिनी"** – संस्कृत संवाद आधारित अभ्यास पुस्तक
10. **AIR संस्कृत समाचार (Audio Reference)**
11. चयनित श्लोक / सूक्तियाँ / संवाद उदाहरण (श्रीमद्भगवद्गीता, हितोपदेश, पंचतंत्र)

पाठ्यक्रम परिणाम:

इस पाठ्यक्रम को पूर्ण करने के उपरांत विद्यार्थी:

- औपचारिक एवं अनौपचारिक प्रसंगों में संस्कृत में संवाद करने में सक्षम होंगे।
- संस्कृत में अनुच्छेद, पत्र, सूचना आदि लेखन कार्यों को शुद्ध एवं प्रभावशाली ढंग से प्रस्तुत कर सकेंगे।

- श्रवण एवं पठन सामग्री को समझकर उत्तर देने तथा उसका विश्लेषण करने में दक्ष होंगे।
- संस्कृत में लघु भाषण, संवाद प्रस्तुति तथा समाचार पठन जैसी व्यावहारिक गतिविधियों में भाग लेने में आत्मविश्वास प्राप्त करेंगे।
- संस्कृत भाषा के प्रति व्यवहारिक दृष्टिकोण एवं रुचि का विकास करेंगे, जिससे वह शिक्षण, अनुवाद, या मंच प्रस्तुति जैसे क्षेत्रों में भी उपयोग कर सकें।

बाह्य परीक्षक के लिए निर्देश:

यह प्रश्न पत्र दो खंडों में विभाजित होगा। परीक्षक से अनुरोध है कि वह पूरे पाठ्यक्रम से खंड ए को अनिवार्य प्रश्न के रूप में निर्धारित करें (यह वस्तुनिष्ठ या व्यक्तिपरक हो सकता है)। खंड बी प्रत्येक इकाई से दो प्रश्नों में से चुनने का विकल्प होगा। छात्रों को प्रत्येक इकाई से एक प्रश्न का उत्तर देना होगा।

251/SKT/AE401

AEC

Semester-IV

Course Code	Course Title	Course ID	L	T	P	L	T	P	Credits	MARKS				
			(Hrs)			Credits				TI	TE	PI	PE	Total
	व्यावहारिक संस्कृत-3		1	0	2	1	0	2	2	15	25	10		50

पाठ्यक्रम विवरण:

पाठ्यक्रम का उद्देश्य विद्यार्थियों को संस्कृत भाषा में उन्नत स्तर की संवादात्मक, लेखन, पठन एवं श्रवण क्षमता से समृद्ध करना है। यह पाठ्यक्रम संस्कृत भाषा के व्यावहारिक प्रयोग पर केन्द्रित है, जिससे छात्र औपचारिक तथा अनौपचारिक स्थितियों में संस्कृत का सुगठित उपयोग कर सकें। विद्यार्थियों को संस्कृत में अनुच्छेद लेखन, संवाद प्रस्तुति, भाषण, तथा समाचार पठन का अभ्यास कराया जाएगा। यह स्तर पूर्ववर्ती दो स्तरों पर आधारित है तथा छात्रों को दैनिक जीवन के आधुनिक प्रसंगों में संस्कृत के व्यवहार में आत्मनिर्भर बनाने की दिशा में अग्रसर करता है।

पाठ्यक्रम उद्देश्य:

- विद्यार्थियों को संस्कृत में संवाद, लेखन एवं श्रवण की उन्नत क्षमता प्रदान करना।
- संस्कृत गद्य-पद्य के माध्यम से संप्रेषण कौशल का विकास करना।
- संस्कृत में अनुवाद, भाषण, वर्णन, अनुच्छेद लेखन आदि के माध्यम से व्यवहारिक दक्षता प्राप्त कराना।
- विद्यार्थियों को संस्कृत भाषा के व्यवहारिक प्रयोग में दक्ष बनाना।
- विद्यार्थियों को औपचारिक एवं अनौपचारिक प्रसंगों में संस्कृत में अभिव्यक्ति हेतु तैयार करना।
- संस्कृत में समाचार, भाषण, संवाद आदि के माध्यम से समसामयिक विषयों पर प्रस्तुति की क्षमता विकसित करना।
- संस्कृत के प्रति रुचि, आत्मविश्वास एवं निरंतर व्यवहारशीलता का विकास करना।

इकाई-1: संवाद कौशल (Conversation Skills)

- संस्कृत में दैनिक जीवन के उन्नत संवाद:
  - कार्यालय, पुस्तकालय, बैंक, बाज़ार, अस्पताल, यात्रा आदि
  - प्रश्नोत्तर शैली, आदान-प्रदान के वाक्य
  - औपचारिक एवं अनौपचारिक शैली में वार्तालाप

- श्रव्य सामग्री पर आधारित अभ्यास (संस्कृत ऑडियो क्लिप/कहानियाँ)

इकाई-2: लेखन अभ्यास (Writing Practice)

- अनुच्छेद लेखन (Paragraph Writing) - 100-150 शब्द
- पत्र लेखन - औपचारिक / अनौपचारिक
- सूचनाओं का लेखन (Notice Writing)
- बधाई/आमंत्रण/प्रार्थना-पत्र आदि का लेखन

इकाई-3: संस्कृत समाचार एवं संवाद (Contemporary Use of Sanskrit)

- संस्कृत में समाचार प्रस्तुति का प्रारंभिक अभ्यास
- आकाशवाणी/दूरदर्शन शैली में संवाद
- संस्कृत में भाषण देना: (1-2 मिनट का लघु भाषण)
- दैनिक समाचारों का संस्कृत अनुवाद (सरल)

मुख्य ग्रन्थ-

1. रचनानुवाद कौमुदी, डॉ. कपिलदेव द्विवेदी
2. संस्कृत वार्तालाप (Sanskrit Vartalap) – प्रो. श्यामसुंदर मिश्र
3. संस्कृत भाषा सीखें (Learn Sanskrit Language) – स्वामी श्रीचरण
4. संस्कृत व्यवहारकौशल (Sanskrit Vyavaharakoushal) – डॉ. गिरीश पाण्डेय
5. संस्कृत संवाद प्रबोधिनी (Sanskrit Samvad Prabodhini) – डॉ. विनोद कुमार
6. संस्कृत व्यावहारिक शिक्षा (Sanskrit Practical Education) – प्रो. रवि शंकर शर्मा
7. संस्कृत संवाद साधना (Sanskrit Samvad Sadhana) – स्वामी त्रिपुरसुंदरी
8. व्यवहारिक संस्कृत (Practical Sanskrit) – डॉ. रामकृष्ण शर्मा
9. **संवादिनी"** – संस्कृत संवाद आधारित अभ्यास पुस्तक
10. **AIR संस्कृत समाचार (Audio Reference)**
11. चयनित श्लोक / सूक्तियाँ / संवाद उदाहरण (श्रीमद्भगवद्गीता, हितोपदेश, पंचतंत्र)

पाठ्यक्रम परिणाम:

इस पाठ्यक्रम को पूर्ण करने के उपरांत विद्यार्थी:

- औपचारिक एवं अनौपचारिक प्रसंगों में संस्कृत में संवाद करने में सक्षम होंगे।

- संस्कृत में अनुच्छेद, पत्र, सूचना आदि लेखन कार्यों को शुद्ध एवं प्रभावशाली ढंग से प्रस्तुत कर सकेंगे।
- श्रवण एवं पठन सामग्री को समझकर उत्तर देने तथा उसका विश्लेषण करने में दक्ष होंगे।
- संस्कृत में लघु भाषण, संवाद प्रस्तुति तथा समाचार पठन जैसी व्यावहारिक गतिविधियों में भाग लेने में आत्मविश्वास प्राप्त करेंगे।
- संस्कृत भाषा के प्रति व्यवहारिक दृष्टिकोण एवं रुचि का विकास करेंगे, जिससे वह शिक्षण, अनुवाद, या मंच प्रस्तुति जैसे क्षेत्रों में भी उपयोग कर सकें।

बाह्य परीक्षक के लिए निर्देश:

यह प्रश्न पत्र दो खंडों में विभाजित होगा। परीक्षक से अनुरोध है कि वह पूरे पाठ्यक्रम से खंड ए को अनिवार्य प्रश्न के रूप में निर्धारित करें (यह वस्तुनिष्ठ या व्यक्तिपरक हो सकता है)। खंड बी प्रत्येक इकाई से दो प्रश्नों में से चुनने का विकल्प होगा। छात्रों को प्रत्येक इकाई से एक प्रश्न का उत्तर देना होगा।

241/HIN/AE401

एम.ए. हिंदी (चतुर्थ सेमेस्टर)

AEC- 03 हिंदी भाषा में रचनात्मक अभिव्यक्ति- III

पूर्णांक- 35+15=50

पाठ्यक्रम के उद्देश्य:1. हिंदी भाषा में रचनात्मक लेखन कौशल को विकसित करना।

2. छात्रों में रचनात्मकता और सोचने की क्षमता को बढ़ाना।

3. विभिन्न लेखन शैलियों का अध्ययन करना और उन्हें समझना।

4. भाषा के साथ खेलने और विभिन्न विचारों को व्यक्त करने के लिए आत्म-विश्वास को बढ़ाना।

पाठ्यक्रम के परिणाम:1. छात्र रचनात्मक अभिव्यक्ति में सुधार कर सकेंगे।

2. विभिन्न लेखन प्रक्रियाओं का प्रयोग कर सकेंगे, जैसे कि निबंध लेखन, कविता लेखन, और कहानी लेखन।

3. भाषा का सही उपयोग करके स्पष्ट और प्रभावशाली रचनाएँ लिख सकेंगे।

4. अपने रचनात्मक प्रकल्पों के माध्यम से अपने विचारों और भावनाओं को समझाएंगे।

पाठ्यक्रम:

इकाई - 1 : गद्य की आधुनिक विधाओं का लेखन और रचनाशीलता

संस्मरण, रेखाचित्र लेखन और रचनाशीलता

संवाद लेखन और रचनाशील धर्म

रिपोतार्ज लेखन, डायरी लेखन, जीवनी लेखन आदि में रचनाशीलता

इकाई - 2 : श्रव्य माध्यम लेखन (आकाशवाणी)

समाचार लेखन और प्रस्तुतीकरण

आकाशवाणी नाटक लेखन प्रविधि और भेद

आकाशवाणी की हिंदी भाषा का स्वरूप

इकाई - 3 : दृश्य-श्रव्य माध्यम (दूरदर्शन) लेखन

धारावाहिक स्वरूप, लेखन

दूरदर्शन चलचित्र (टेलीफिल्म)

दूरदर्शन का विज्ञापन और उसकी हिंदी भाषा

दूरदर्शन के दृश्य-श्रव्य तत्वों का सामंजस्य

हिंदी के समक्ष दूरदर्शन संबंधी चुनौतियाँ

निर्देश-

1. पाठ्यक्रम में निर्धारित प्रत्येक **इकाई** में कम से कम एक दीर्घ प्रश्न अवश्य पूछा जाएगा। पूछे गए प्रश्नों की संख्या चार होगी, जिसमें से परीक्षार्थी को कुल दो प्रश्न करने होंगे। प्रत्येक प्रश्न के लिए 8 अंक निर्धारित है। पूरा प्रश्न कुल 16 अंकों का होगा।

2. पूरे पाठ्यक्रम में से कुल छः लघुत्तरी प्रश्न पूछें जाएंगे, जिनमे से परीक्षार्थी को 150 शब्दों में किन्हीं चार प्रश्नों का उत्तर देना होगा। प्रत्येक प्रश्न तीन अंक का होगा। पूरा प्रश्न 12 अंकों का होगा।

3. पूरे पाठ्यक्रम में से 7 वस्तुनिष्ठ अनिवार्य प्रश्न पूछे जाएंगे। प्रत्येक प्रश्न एक-एक अंक का होगा।

सहायक ग्रन्थ :

1. हिंदी रचनात्मक लेखन- राघवेंद्र पांडेय
2. रचनात्मक लेखन के सिद्धांत- नामवर सिंह
3. सृजन और अभिव्यक्ति - मैनेजर पाण्डेय
4. हिंदी साहित्य का सरल इतिहास - डॉ. शिवकुमार मिश्र

Department of Chemistry
Scheme: M.Sc Chemistry (02 Years)

SEC-02	Medicinal chemistry	241/CHE/SE/301	2			2			2	15	35			50
Value-added Course(s)														
VAC-02	Interdisciplinary Chemistry	241/CHE/VA/301	2			2			2	15	35			50
Seminar														
Seminar									2					50
Internship/Field Activity#														
									4					
Total Credits									28					

#Four credits of internship earned by a student during summer internship after 2nd semester will be counted in 3rd semester of a student who pursue 2 year PG Programme without taking exit option.

Semester 4

Course Code	Course Title	Course ID	L	T	P	L	T	P	Total Credits	MARKS				
			(Hrs)			Credits				TI	TE	PI	PE	Total
Ability Enhancement Course(s)														
AEC-03	Advanced Inorganic Chemistry	241/CHE/AE/401	2			2			2	15	35			50
	Advanced Physical Chemistry	241/CHE/AE/411												
	Advanced Organic Chemistry	241/CHE/AE/421												
Dissertation/Project Work														
Dissertation									20					
Total Credits									22					

Department of chemistry PG (Semester IV)

Advanced Physical Chemistry 24/CHE/AE401

Course Code AEC-03			Course Title Advanced Physical Chemistry-			Course ID				
L	T	P	L	T	P	Total Credits	MARKS			
(Hrs)			Credits				TI	TE	PI	PE	Total
2			2			2	15	35	-	-	50
Examination Duration:			**Theory**: 2 Hrs								

Course Objectives	The primary objectives of this course are: 1. To introduce the fundamentals of quantum states, complexions, and probability distributions in statistical mechanics. 2. To develop a deep understanding of Maxwell-Boltzmann statistics and the role of partition functions in thermodynamics. 3. To analyze the statistical basis of heat capacities in gases and solids at various temperatures. 4. To study advanced quantum statistics including Bose-Einstein and Fermi-Dirac distributions. 5. To connect microscopic particle behavior with macroscopic thermodynamic properties. 6. To explore quantum effects in systems like electron gases, liquid helium, and ortho/para hydrogen. 7. To equip students with tools to apply statistical methods to real-world physical and chemical systems.
Course Outcomes:	After the completion of this course, the students will be able to: 1. Describe and calculate probabilities and distributions for quantum and classical systems. 2. Evaluate partition functions and relate them to thermodynamic quantities for molecular systems. 3. Analyze heat capacity behavior in solids using Einstein and Debye models. 4. Compare and apply Maxwell-Boltzmann, Bose-Einstein, and Fermi-Dirac statistics. 5. Explain quantum phenomena in low-temperature systems and condensed matter. 6. Calculate equilibrium constants using partition functions and interpret their physical significance. 7. Apply statistical mechanics to predict physical behavior of gases, solids, and quantum systems.

COURSE SYLLABUS

Note: 1. Question no. 1 is compulsory, which contains short answer type questions and to be set from the entire syllabus.
2. Eight questions will be set, two from each of the units I, II, III & IV. The candidates are required to attempt four questions in all selecting at least one question from each section. All questions shall carry equal marks.
3. The question paper must be set in consonance with course outcomes.

Unit No.	Contents	Contact Hrs
I	**Statistical Mechanics-I**	8

	definite total energy, Degeneracy of energy levels, Probability and most probable distribution, Indistinguishability.	
II	**Statistical Mechanics-II** Maxwell-Boltzmann statistics, partition function, Translational, rotational, vibrational, nuclear and electronic partition functions, partition functions and their relation to thermodynamic quantities, Maxwell-Boltzmann law for gaseous system, Thermodynamic functions for gaseous systems	7
III	**Statistical Mechanics-III** Heat capacity of hydrogen at low temperatures, Heat capacities of monoatomic crystals, The Einstein model, Debye's theory of solid, Heat capacities of crystals at very low temperatures. Expression of equilibrium constant in terms of partition functions	7
IV	**Statistical Mechanics-IV** Bose-Einstein statistics, Fermi Dirac Statistics, Comparison of M-B, B-E and F-D statistics, Fermi-Dirac gas (Electron gas in metals)-Bose-Einstein gas (liquid Helium). Statistical thermodynamics of ortho and para hydrogen.	8
Suggested Books		
Theory	1. Statistical Mechanics: Algorithms and Computations by Werner Krauth (Oxford University Press, 2006). 2. Introduction to Modern Statistical Mechanics by David Chandler (Oxford University Press, 1987). 3. Polymer Chemistry: An Introduction by Malcolm P. Stevens (Oxford University Press, 1999). 4. Principles of Polymer Chemistry by Paul J. Flory (Cornell University Press, 1953). 5. Thermodynamics: An Engineering Approach by Yunus A. Cengel and Michael A. Boles (McGraw-Hill, 2007). 6. Physical Chemistry by Peter Atkins and Julio de Paula (Oxford University Press, 2014). 7. Principles of Physical Chemistry by Puri, Sharma and Pathania (Vishal Publishing Co.). 8. A Textbook of Physical Chemistry by K. L. Kapoor (McGraw Hill Education).	
	Assessment and Evaluation	
Theory	Internal Assessment: 15 Marks	• Class Participation: 05 Marks • Seminar/Presentation/ Assignment: 05 Marks • Mid Term Exam: 5 Marks
	External Assessment: 35 Marks (02 Hours)	• End Term Exam: 35 Marks

Department of chemistry PG (Semester 4th)

24I|CHE|AE402

Course Code AEC-03			Course Title Advanced Organic Chemistry				Course ID				
L	T	P	L	T	P	Total Credits	MARKS				
(Hrs)			Credits				TI	TE	PI	PE	Total
2			2			2	15	35	-	-	50
Examination Duration:			**Theory**: 2 Hrs								
Course Objectives			1. To introduce the concepts of synthons, synthetic equivalents, and functional group interconversions, emphasizing principles of the disconnection approach in organic synthesis. 2. To explain one- and two-group C-X and C-C disconnections, with a focus on chemoselectivity, regioselectivity, stereoselectivity, and stereospecificity in synthetic planning. 3. To explore advanced synthetic strategies, including polarity reversal, amine and alkene synthesis, ring construction, and the role of photochemistry and ketones in organic synthesis. 4. To provide insights into protection strategies for functional groups and their application in C-C disconnections involving Diels-Alder reactions, carbonyl condensations, and Michael additions.								
Course Outcomes:			After the completion of this course, student will be able to: 1. Demonstrate an understanding of synthons, synthetic equivalents, and the principles of the disconnection approach in designing organic syntheses. 2. Apply knowledge of C-X and C-C disconnections to solve problems involving chemoselectivity, regioselectivity, and stereoselectivity. 3. Analyze and design synthetic pathways using polarity reversal, photochemistry, and functional group transformations for complex molecule synthesis. 4. Implement protection strategies for functional groups in multistep organic syntheses, applying advanced disconnection techniques for carbon-carbon bond formation.								

COURSE SYLLABUS

Note: 1. Question no. 1 is compulsory, which contains short answer type questions and to be set from the entire syllabus.

2. Eight questions will be set, two from each of the units I, II, III & IV. The candidates are required to attempt four questions in all selecting at least one question from each section. All questions shall carry equal marks.

3. The question paper must be set in consonance with course outcomes.

Unit No.	Contents	Contact Hrs
I	**Disconnection Approach-I** An introduction of synthons and synthetic equivalents, general principles of the disconnection approach, functional group interconversions, the importance of order of events in organic synthesis, one group C-X and two group C-X disconnections.	8

II	**Disconnection Approach-II** One group C-C disconnection, chemoselectivity, regioselectivity, regiospecificity, stereoselectivity and stereospecificity. Reversal of polarity, amine synthesis, Synthesis of alkenes-use of wittig reagents, use of acetylene and aliphatic nitro compounds in organic synthesis, synthesis of three membered rings.	8
III	**Disconnection Approach-III** Photochemistry in organic synthesis: synthesis of four membered rings, uses of ketenes in organic synthesis, synthesis of five and six membered rings. Principle of protection of alcoholic, amino, carbonyl and carboxylic groups.	7
IV	**Disconnection Approach-IV** Two group C-C disconnection- Diels Alder reactions, 1,3-difunctionalized compounds and α,β-unsaturated carbonyl compounds, control in carbonyl condensations, 1,5-difunctionalized compounds-Michael addition and Robinson Annulation.	7
Suggested Books	1. Designing Organic Synthesis, S.Warren, Wiley. 2. Some Modern Methods of Organic Synthesis, W. Carruthers, Cambridge Univ. Press. 3. Modern Synthetic Reactions, H. O. House, W.A. Benzamin.	
	Assessment and Evaluation	
Theory	Internal Assessment: 15 Marks	• Class Participation: 05 Marks • Seminar/Presentation/Assignment: 05 Marks • Mid Term Exam: 05 Marks
	External Assessment: 35 Marks (02 Hours)	• End Term Exam: 35 Marks

Department of Chemistry PG (Semester 4th)

241/CHE/AE403

Course Code AEC-03			Course Title Advanced Inorganic Chemistry				Course ID				
L	T	P	L	T	P	Total Credits	MARKS				
(Hrs)			Credits				TI	TE	PI	PE	Total
2			2			2	15	35	-	-	50
Examination Duration:			Theory: 2 Hrs				Practical: 6 Hrs (Two sessions)				
Course Objectives			1. Learn fundamental principles of photochemistry and analyze photochemical reactions using Jablonski diagrams and related processes. 2. Develop proficiency in light scattering techniques like nephelometry and turbidimetry, with an understanding of their applications. 3. Master polarographic analysis techniques, including wave evaluation and electrode behavior. 4. Gain practical knowledge in electrogravimetry, including electrolysis processes and deposition principles. 5. Explore advanced electrochemical methods such as coulometry, amperometry, and voltammetry for quantitative analysis.								
Course Outcomes:			After completing this course, students will be able to: 1. To have basic understanding of photochemistry, Jablonski diagram and Franck-Condon principle. 2. Differentiate between nephelometry and turbidimetry based on principles and applications. 3. Apply polarographic techniques, interpret polarographic waves, and understand electrochemical principles. 4. Perform electrogravimetry, coulometry, and amperometry for quantitative analysis. 5. Utilize voltametric techniques such as cyclic, anodic, and cathodic stripping voltammetry.								

COURSE SYLLABUS

Note: 1. Question no. 1 is compulsory, which contains short answer type questions and to be set from the entire syllabus.

2. Further, eight questions will be set, two from each of the units I, II, III & IV. The candidates are required to attempt four questions in all selecting at least one question from each section. All questions shall carry equal marks.

3. The question paper must be set in consonance with course outcomes.

Unit No.	Contents	Contact Hrs
I	**Photochemistry** Laws of photochemistry: (Grothus-Draper law, Stark-Einstein law of photochemical equivalence and Lambert-Beer's law), quantum yield, quantum efficiency, singlet and triplet state, Jablonski Diagrams: Vibrational Relaxation, Internal Conversion, Intersystem Crossing, Fluorescence, and Phosphorescence; Fluorescence Spectra, Franck-Condon principle, Radiative Lifetime.	7
II	**Nephelometry and Turbidimetry** Theory-light scattering, choice and comparison between nephelometry and turbidimetry, factors affecting measurement, instrumentation, applications.	8

	Polarography General principles, diffusion controlled current, dropping mercury electrode, Ilkovic equation (without proof), Half-wave potentials, over potential, Evaluation of Polarographic waves, Conditions for performing Polarographic determinations and applications of Polarography	
III	**Electro analytical methods of Analysis** Electrogravimetry: Current-voltage relationship during an electrolysis, decomposition potential, constant current electrolysis, constant cathode potential electrolysis, apparatus. electrodes, mercury cathode, applications physical properties of electrolytic precipitates, chemical factors of importance in electrodeposition.	**8**
IV	**Coulometry and Amperometry** Coulometric analysis: Principle, Coulometric methods of constant electrode potential and coulometric titrations. Apparatus and applications. Amperometric titrations, cathodic stripping voltammetry, anodic stripping voltammetry, and cyclic voltammetry.	7

Suggested Books

1. Physical methods in Chemistry; R. S. Drago; Saunders, Philadelphia.
2. Fundamentals of Analytical Chemistry; D.A. Skoog, O.M. West and F.J. Holler; W.B. Saunders.
3. Instrumental methods of Analysis; L.L. Merits, R.H. Willard and J.A. Dean; Van Nostrand-Reinhold.
4. Instrumental Methods of Chemical Analysis by Gurdeep R. Chatwal and Sham K. Anand
5. A Textbook of Quantitative Inorganic Analysis, A.I. Vogel; ELBS, London.
6. Electroanalytical Methods: Guide to Experiments and Applications by Fritz Scholz
7. Principles of physical chemistry by Puri Sharma Pathania

Theory:	**SUGGESTED WEB SOURCES:** 1. https://nptel.ac.in/course.html 2. https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=5 3. https://swayam.gov.in/explorer?category=Chemistry	
	Assessment and Evaluation	
Theory	Internal Assessment: 15 Marks	• Class Participation: 05 Marks • Seminar/Presentation/ Assignment: 05 Marks • Mid Term Exam: 05 Marks
	External Assessment: 35 Marks (02 Hours)	• End Term Exam: 35 Marks

241/HIS/AE401

AEC-03	ART AND SCIENCE IN HISTORY WRITING

Credits:2

Maximum Marks :50
Theory Examination:35
Internal Assessment:15
Examination Time: 2 hrs.

Course Outcomes: By the end of the course the student should be able to:

Learning Outcomes:

CO1:Analyze how myths and memory were used in early historical interpretations and Trace the shift from narrative to analytical history.

CO2:Evaluate the claims of objectivity and empirical rigor in history writing.

CO3:Explore how literary techniques influence historical interpretation.

CO4:Analyze interdisciplinary approaches to history.

Note: **The students will be required to attempt five questions in all.**
Question No.1 will be compulsory comprising of 7 short answer type question of 1 mark each and will cover the entire syllabus 7x1=7 marks. In addition to it Question Nos. II to XI will consist of long answer (essay type) questions , four Questions from each Unit with internal choices carrying 7 marks each Ie 4x7= 28 marks thus making it the total weight age to 50 marks. Four long questions to be attempted. Two from each unit .

Unit 1:

History as Science — Rationalism, Evidence, and Positivism

- Origins of history writing in ancient Times: Mythological History, oral traditions, and early historical consciousness.

. Historical writing in ancient India (Itihasa Purana, and Epics)

. Enlightenment Era and the professionalization of history, Ranke and development of Empiricism, Emergence of the scientific method of history

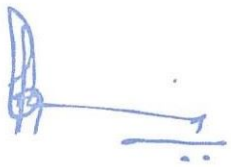
Unit 2:

History as Art — Narrative, Imagination, and Interpretation

The role of storytelling and imagination in constructing history, Popular History vs Academic history, Interdisciplinary Histories — Bridging Gaps between Art, Science, and Society, History and visual arts: using paintings, films, photography as historical texts, Environmental history, digital history, and data-driven methods, Public history and museum studies.

Suggested Readings:

- Excerpts from *The Histories* (Herodotus) and *The Peloponnesian War* (Thucydides)
- Sima Qian, *Records of the Grand Historian*
- Romila Thapar, *Past Before Us*
- Leopold von Ranke, selections from *History of the Latin and Teutonic Nations*
- E.H. Carr, *What is History?*
- Marc Bloch, *The Historian's Craft*
- Carlo Ginzburg, *The Cheese and the Worms*
- Hayden White, *Metahistory*
- Natalie Zemon Davis, *The Return of Martin Guerre*
- Robert Darnton, *The Great Cat Massacre*
- Dipesh Chakrabarty, "The Climate of History"
- Selections from Peter Burke, *Eyewitnessing: The Uses of Images as Historical Evidence*



251/MBABA/AE201

Corporate Leadership & Networking Skills
24MGAEC2

Credits: 2

External Marks: 35 (TE)
Internal Marks: 15 (TI)

Type of Course: Ability Enhancement Course

Course Objectives:

This course enables the students to explore what kind of leader one wants to be, what kind of leader you are and how to align your leadership behaviour with your goals. In this course, you will get a number of opportunities to experience leadership in action and allow you to reflect on the nature of leadership and discover your strengths and weaknesses as a leader. You will have an opportunity to lead a team as well as to be a member of a team led by others. This course is different from conventional courses since you learn-by-doing, by learning from experiences. Rather than just reading about other leaders, you will find yourself in situations in which you must play the role of a leader. For experiential learning to work you must engage in the activities fully, reflect upon your own and others behavior. Put in effort to try new behavior, receive and give constructive feedback. The more students will engage in this, the greater will be the learning and development of capacity to learn from any experience.

Course Outcomes:

On the completion of this course the student will be able to:

CO1: Develop knowledge and understanding of Corporate Communication skills, like e-mail writing, report writing, resume writing, social networking to facilitate professional image building and branding.

CO2: Apply the basic mechanics of group & individual communication for different types of audience.

CO3: Analyze the ability to lead the organization by effective use of business communication, while following ethical code of conduct.

CO4: Evaluate the effectiveness of practices and strategies of business communication for value based leadership

Detailed syllabus:

UNIT I

Business communication at workplace: bad news messages, persuasive written communication, memos, notice, agenda and minutes of meeting.

Report Writing: Types of business reports, structure of reports, short reports, long reports, abstracts and summaries, proposals

UNIT II

Email Writing: Email Etiquette, Tips to Writing Effective Emails, Common Grammar Errors, Letters Template, Writing Results Oriented Letters (Sales and Marketing and other Media Relations), Writing Results-Oriented Job Search Emails, Writing Results Oriented Letters: Customer Relations, Writing Results Oriented Letters: Placing and Acknowledging Orders, Writing The Extended Email (Reports and Proposals),Writing a Short Report (Making and Supporting Your Idea)

UNIT III

Introduction to personal branding: Business Cards, Resume writing, LinkedIn, crafting your personal brand, knowing your brand (Personal SWOT), Writing a brand story (yours). Controlling your brand (Protocol- poise, business etiquette, Personal-image, dressing your brand, Professional-presentations, communicating your brand (social media-LinkedIn, create your ad). Demonstrate and build your brand (business cards), Building a personal network, Personal branding in the work place.

UNIT IV

Conflict Resolution and Negotiation Skills, Creating a Powerful First Impression and Social Skills - Office Etiquettes, Time Management.

SUGGESTED READINGS:

1. Murphy, Herta A., Herbert W. Hildebrandt & Jane P Thomas, Effective Business Communication, Tata McGraw Hill, New Delhi
2. Konera, Arun, Professional Communication, Tata McGraw Hill, New Delhi
3. McGrath, E.H., Basic Managerial Skills for All, PHI, New Delh
4. Meenakshi Raman & Prakash Singh, Business Communication, Oxford University Press, New Delhi

Mapping Matrix of Course : 24MGAEC2

Table 1: CO-PO Matrix for the Course 24MGAEC2: Corporate Working Skills

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	3	2	2	2	2	3	2	2	2	2
CO2	3	2	2	3	3	2	2	3	2	2
CO3	2	2	3	3	2	2	3	3	3	3
CO4	2	2	3	2	3	2	2	2	2	2
Average	2.5	2	2.5	2.5	2.5	2.25	2.25	2.5	2.25	2.25

241/MBABA/AE401

Data Visualization with Power BI

PAPER CODE:

Credits: 2

External Marks: 35
Internal Marks: 15
Time Allowed: 2 Hrs

Type of Course: Ability Enhancement Course

Course Objectives:

This course provides a detailed introduction to data visualization using Power BI. It is designed to equip students with essential skills in data preparation, transformation, and interactive dashboard development using Power BI's desktop interface. The course focuses on building professional-quality visual reports to support data-driven decision-making across industries.

Course Outcomes: On the completion of this course the student will be able to:

- **CO1:** Understand Power BI deployment modes, project collaboration, dataset design, and licensing.
- **CO2:** Prepare and transform datasets using Power BI's M Query interface, staging queries, and direct query models.
- **CO3:** Create and format interactive reports, dashboards, and custom visuals using Power BI's visualization tools.
- **CO4:** Apply advanced filtering, drill-through reports, bookmarks, and other analytical features to design dynamic dashboards.

UNIT I

Introduction to Power BI
Power BI Deployment Modes, Project Discovery and Ingestion, Power BI Project Roles, Admin and Project Role Collaboration, Power BI Licenses, Data Warehouse Bus Matrix, Dataset Design Process, Data Profiling, Dataset Planning, Data Transformations, Import Mode, Direct Query Mode.

UNIT II

Data Transformation and M Query Design
Query Design per Dataset Mode, Connecting to Data Sources, Authentication, Privacy Levels, Power BI Desktop Options, M Queries, Data Source Parameters, Staging Queries, Fact and Dimension Queries, M Query Summary, Data Types. Direct Query Data Models: Views, Tables, Relationships.

UNIT III

Creating and Formatting Reports
Report Planning, Connecting Live to Power BI Datasets, Choosing Visuals, Visual Interactions, Slicers, Report Filter Scopes, Report Filter Conditions, Visual-Level Filtering, Visualization Formatting, conditional formatting in visuals, themes and custom color palettes, the Performance Analyzer tool.

UNIT IV

Custom Visuals, Dashboards and Analytics

Designing Interactive Dashboards, Drill-through Report Pages, Bookmarks, Analytics Pane, Quick Insights, Custom Visuals, Dashboard Design, Connecting Multiple Reports and Dashboards for Comprehensive Analysis. Multi-Dashboard Architectures:

Suggested Readings:

1. Chandraish Sinha, 2021, *Mastering Power BI: Build Business Intelligence Applications Powered with DAX Calculations, Insightful Visualizations, and Loads of Data Sources*, BPB.
2. Kieran Healy, 2018, *Data Visualization: A Practical Introduction*, Princeton University Press.
3. Julia Steele & Noah Iliinsky, 2010, *Beautiful Visualization*, O'Reilly Media.
4. Hadley Wickham, Garrett Grolemund, 2017, *R for Data Science: Import, Tidy, Transform, Visualize and Model Data*, O'Reilly.
5. Reza Rad, 2023, *Power BI DAX Simplified: DAX and Calculation Concepts for Power BI Users, RADACAD.*

Mapping Matrix of Course:

Table 1: CO-PO & CO-PSO Matrix for the Course: Data Visualization with Power BI

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**
CO1	3	1	1	2	2	2	1	2	2	3

CO2	2	3	2	3	3	2	2	1	3	3
CO3	3	2	2	3	3	2	1	2	2	2
CO4	3	2	3	2	3	1	2	3	2	2
Average	2.75	2	2	2.5	2.75	1.75	1.5	2	2.25	2.5

SUGGESTED READINGS:

1. Murphy, Herta A., Herbert W. Hildebrandt & Jane P Thomas, Effective Business Communication, Tata McGraw Hill, New Delhi
2. Konera, Arun, Professional Communication, Tata McGraw Hill, New Delhi
3. McGrath, E.H., Basic Managerial Skills for All, PHI, New Delh
4. Meenakshi Raman & Prakash Singh, Business Communication, Oxford University Press, New Delhi

Mapping Matrix of Course : 24MGAEC2

Table 1: CO-PO Matrix for the Course 24MGAEC2: Corporate Working Skills

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	3	2	2	2	2	3	2	2	2	2
CO2	3	2	2	3	3	2	2	3	2	2
CO3	2	2	3	3	2	2	3	3	3	3
CO4	2	2	3	2	3	2	2	2	2	2
Average	2.5	2	2.5	2.5	2.5	2.25	2.25	2.5	2.25	2.25

241/MBA/AE401

BUSINESS NEGOTIATION SKILLS
24MGAEC3

Credits: 2

External Marks: 35 (TE)
Internal Marks: 15 (TI)

Type of Course: Ability Enhancement Course

Course Objectives: This course aims to gain a comprehensive understanding of negotiation theory, including key concepts such as interests, positions, and negotiation styles. Also, this course targets to enhance verbal and non-verbal communication skills necessary for effective negotiation,

Course Outcomes: After completing the course students would be able to:
CO1: Understand the core concepts, process, theories and skills required for negotiation.
CO2: Apply complex theory and practice of negotiation in conflict resolution.
CO3: Analyse the negotiation skills of parties by taking real life example.
CO4: Evaluate different negotiation styles and approaches, considering their strengths, weaknesses, and appropriateness for various contexts.

Detailed syllabus:

UNIT-I

Negotiation Fundamentals – Nature of negotiation, strategies and tactics of distributive bargaining an integrative negotiation, strategic and planning issues in negotiation

UNIT-II

Negotiation Sub Processes – Building blocks of negotiation: Perception, cognition and emotions; role of communication in negotiation, sources and application of power in negotiation, ethical issues in negotiation

UNIT-III

Negotiation Contexts – Relationshipin negotiations: agent constituencies, coalitions; individual differences in negotiation: personality, abilities, gender

UNIT-IV

Key Issues – International and cross-cultural negotiation, managing negotiation impasses managing negotiation mismatches, managing difficult negotiations

SUGGESTED READINGS:

1. Lewicki, Roy J., David M Saunders and Bruce Barry, Negotiations, Tata McGraw Hill, New Delhi
2. Rao, S.L., Negotiation Made Simple, Excel Books, New Delhi

Mapping Matrix of Course: 24MGAEC3

Table 1: CO-PO & CO-PSO Matrix for the Course 24MGAEC3: BUSINESS NEGOTIATION SKILLS

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	3	2	2	1	3	2	2	2	2	1
CO2	3	3	2	2	2	1	1	1	2	1
CO3	2	3	2	3	2	1	2	2	1	2
CO4	2	3	3	3	2	2	2	2	2	3
Average	2.5	2.75	2.25	2.25	2.25	1.5	1.75	1.75	1.75	1.75

GURUGRAM UNIVERSITY, GURUGRAM

(Established under Haryana Act 17 of 2017)

MASTER OF PUBLIC HEALTH

(COMMUNITY MEDICINE)

(Two Year Post Graduate Program)

(Structure & Syllabi)

Effective from the Academic Session- 2024-2026

Department of Public Health
Faculty of Life Sciences
Gurugram University
Gurugram-122018
HARYANA (INDIA)

Semester 4															
Course ID	**Course Title**	**Course ID**	**L**	**T**	**P**	**L**	**T**	**P**	**Total Credits**	**MARKS**				
			(Hrs.)			**Credits**				**TI**	**TE**	**PI**	**PE**	**Total**
Ability Enhancement Course(s)														
AEC-2	Communication and Training in Health		2						2	15	35			**50**
Dissertation / Project Work														
Dissertation								20	**20**			150	350	**500**
Total Credits									**22**					**550**

241/MPH/AE401

Semester 4

1. Communication and Training in Health

Course Objectives

To understand the principles and models of communication relevant to public health.

To develop skills in designing and delivering health communication strategies.

To explore training methodologies for building capacity in the health workforce.

To integrate behavior change communication (BCC) and IEC approaches into public health programs.

Unit I: Fundamentals of Health Communication

Definitions and elements of communication

Types and channels: interpersonal, group, mass media, digital media

The communication process: sender, message, medium, receiver, feedback

Barriers to effective communication

Role of culture and literacy in health communication

Unit II: Behavior Change Communication (BCC) and IEC

BCC: concepts, importance, and strategy design

IEC (Information, Education, Communication) in health promotion

Health belief models and theories used in BCC

Designing and evaluating IEC materials

Case studies of BCC in national programs (e.g., Mission Indradhanush, Family Planning)

Unit III: Training in Public Health

Concept and importance of training in health systems

Training cycle: needs assessment, planning, implementation, and evaluation

Adult learning principles and participatory training methods

Tools and techniques for training: role-plays, case studies, group discussions

Designing training modules for ASHA, ANM, and frontline workers

Unit IV: Communication Strategies and Advocacy

Advocacy vs. communication in public health

Stakeholder mapping and engagement

Social marketing approaches in public health

Use of ICT in training and communication (mobile health, e-learning)

Monitoring and evaluation of communication and training programs

Suggested Readings:

Gupta R. Health Communication: Theory and Practice

WHO. Effective Communication in Outbreak Management

Hubley J., The Psychology of Health Communication

Ministry of Health & Family Welfare. BCC Operational Guidelines

Freire P. Pedagogy of the Oppressed (for adult learning concepts)

Ability Enhancement Course from the department for pool of the Courses in the University

(These courses are offered by each department for students of other departments/same department and is designed to provide value-based and/or skill-based knowledge and should contain both theory and lab/hands on/training/field work.)

Course Code	Course Title	Course ID	L	T	P	L	T	P	Credits	MARKS				
			(Hrs)			Credits				TI	TE	PI	PE	Total
AEC-3	Essentials of Writing Skills		2	-	-	2	-	-	2	15	35	-	-	50

241/ENG/AE401

AEC- 3

Essentials of Writing Skills

Course Objectives

CO	Description
CO-1	Teach effective editing and revision strategies to refine and improve the clarity, coherence, and conciseness of written work.
CO-2	Explore professional writing genres and contexts, preparing students to write effectively in academic, business, and other professional settings.
CO-3	Promote a culture of peer review, where students provide and receive constructive feedback on their writing.

Course Outcomes

On completing the paper, **Essentials of Writing Skills** the students shall be able to realize following programme outcomes:

CO	Description
CO-1	To have an understanding of the elements and conventions of writing skills for research
CO-2	To convert skills of summarizing into bulleted points for PowerPoint presentations.
CO-3	To focus more on the application of the learnt principles

AEC-3

Nomenclature of the Course: Essentials of Writing Skills

Max. Marks: 50
Theory: 35
Internal Assessment: 15

UNIT 1

Basics of Writing Skills (Language and Style)

1. Definition: Forms, Structures

2. Conventions of register-specific academic writing

3. Academic Vocabulary Building, Words and Phrases

Unit II

Reading, Critical Thinking and Writing

a. Reading

1. Reading Broadly and Narrowly

2. Critical Reading towards Critical Writing

3. Re-reading for Grammar, Punctuation and Style- Errors in Grammar, Errors in language use, Punctuation Errors, Referencing style and format

b. Writing

1. Note taking techniques

2. Taking Notes from Research Reading (Recommended Strategies, Direct and Indirect Quotes)

3. Effective Note making

Unit III

Report, Synopsis/ Abstract and Term Paper, Presentation (PPT)

1. Working on and developing the theme

2. Integration of Style, Structure and Format

3. Presentations: Preparation and Planning, Creating Interest

4. Establishing a Relationship with the Audience

Textbooks:

Cottrell, Stella.2003. *The Study Skills Handbook*, Palgrave Macmillan.

Gupta, Renu. 2010. *A Course in Academic Writing*. Orient Blackswan.

Suggested Readings:

Murphy, Raymond. 1992. *Elementary English Grammar* (*2nd edition*). Cambridge University Press.

Murphy, Raymond. 1994. *Intermediate English Grammar* (*2nd edition*). Cambridge University Press.

Hewings, Martin. 1999. *Advanced English Grammar*. Cambridge University Press. Hayot, Eric. 2014. *The Elements of Academic Style*: *Writing for the Humanities.*

Columbia Univ. Press: New York.

Instructions to the Paper-Setter and students:

- All questions are compulsory.
- Question no. 1 will be short-answer type question covering all Units. The students are required to attempt any 4 out of 6. (4×2= 8marks)
- Question no. 2 will be short-answer type question covering Unit I with internal choice. (9 marks)
- Question no. 3 will be short-answer type question covering Unit II with internal choice. (9 marks)
- Question no. 4 will be short-answer type question covering Unit III with internal choice. (9 marks)

241/PHY/AE401

Ability Enhancement Course(s)

COURSE ID: 241/PHY/AE401

INTRODUCTION TO ASTROPHYSICS

Marks (Theory): 35 **Credits: 2**

Marks (Internal Assessment): 15 **Time: 2 Hours**

Note: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist of at least 4 parts covering entire syllabus. The question paper is expected to contain problems to the extent of 20% of total marks. The examinee will be required to attempt 5 questions; selecting one question from each unit and the compulsory.

Course Outcomes:

After successful completion of the course on Introduction to Astrophysics, a student will be able:

- *Explain the historical evolution of astronomy and interpret key astronomical scales such as distance, mass, time, brightness, and temperature; apply concepts of positional astronomy using celestial coordinate systems.*
- *Demonstrate understanding of astronomical observation techniques, including the principles and types of telescopes, telescope mountings, and modern detectors, along with the role of Earth's atmosphere in astronomical observations.*
- *Analyze the structure, dynamics, and classification of galaxies, including the Milky Way's rotation; understand fundamental cosmological concepts such as standard candles, Hubble's law, and explore the scientific basis of astrobiology.*
- *Summarize India's contributions to astronomy from ancient to modern times and describe the significance of current Indian observatories and space-based astronomy missions.*

Unit – I

Introduction and Astronomical Scales: History of astronomy, wonders of the Universe, overview of the night sky, diurnal and yearly motions of the Sun, Astronomical Distance, Mass and Time, Scales, Brightness, density, Radiant Flux and Luminosity and temperature of astronomical objects, basic concepts of positional astronomy: Celestial sphere, Astronomical coordinate systems, Horizon system and Equatorial system.

Unit – II

Astronomical techniques: Basic Optical Definitions for Astronomy (Magnification Light Gathering Power, Resolving Power and Diffraction Limit, Atmospheric Windows), Optical Telescopes (Types of Reflecting Telescopes, Telescope Mountings, Space Telescopes, Detectors and Their Use with Telescopes (Types of Detectors, detection Limits with Telescopes).

Unit – III

Ranjit

Physics of Galaxies: Basic structure and properties of different types of Galaxies, Nature of rotation of the Milky Way (Differential rotation of the Galaxy), Idea of dark matter

Cosmology and Astrobiology: Standard Candles (Cepheids and SNe Type1a), Cosmic distance ladder, Olber's paradox, Hubble's expansion, History of the Universe, Chemistry of life, Origin of life, Chances of life in the solar system

Unit – IV

Astronomy in India: Astronomy in ancient, medieval and early telescopic era of India, current Indian observatories (Hanle-Indian Astronomical observatory, Devasthal Observatory, Vainu Bappu Observatory, Mount Abu Infrared Observatory, Gauribidanur Radio Observatory, Giant Metre-wave Radio Telescope, Udaipur solar observatory, LIGO-India)(qualitative discussion)Indian astronomy missions(Astrosat, Aditya)

References/Books:

- Modern Astrophysics, B.W.Carroll & D.A.Ostlie, Addison-Wesley Publishing Co.
- Introductory Astronomy and Astrophysics, M. Zeilik and S.A. Gregory, 4th Edition, Saunders College Publishing.
- Fundamental of Astronomy (Fourth Edition), H. Karttunen et al. Springer
- K.S. Krishnasamy, Astro Physics a modern perspective, Reprint, New Age International (p) Ltd, New Delhi, 2002.
- Baidyanath Basu, An introduction to Astrophysics, Second printing, Prentice - Hall of India Private limited, New Delhi,2001.
- Explorations: Introduction to Astronomy, Thomos Arny and Stephen Schneider, 2014, 7th edition, McGraw Hill
- Textbook of Astronomy and Astrophysics with elements of cosmology, V.B. Bhatia, Narosa Publication.
- Astronomy in India: A Historical Perspective, Thana Padmanabhan, Springer.