

Course Outcomes

2021-22

Name of the Faculty – Arts

Name of Faculty : Arts
Name of Department : Marathi
U.G. Programme : F.Y.B.A. to T.Y.B.A. ,& F.Y.B.Com, S.Y.B.Sc

F.Y.B.A. (SEM 1)

❖ विषय : मराठी साहित्य : कथा आणि भाषिक कौशल्य विकास : (CC-1A)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. कथा या साहित्य प्रकारची ओळख करून देणे.
२. कथा या साहित्य प्रकारचे स्वरूप, घटक आणि प्रकार यांची ओळख करून देणे.
३. विविध साहित्य प्रवाहांमधील कथा या साहित्य प्रकारातील निवडक कथांचे अध्ययन करणे.
४. भाषिक कौशल्य विकास करणे.

F.Y.B.A. (SEM 2)

❖ विषय : मराठी साहित्य : एकांकिका आणि भाषिक कौशल्य विकास : (CC-1A)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. एकांकिका या साहित्य प्रकारची ओळख करून देणे.
२. एकांकिका या साहित्य प्रकारचे स्वरूप, घटक आणि प्रकार यांची ओळख करून देणे.
३. विविध साहित्य प्रवाहांमधील एकांकिका या साहित्य प्रकारातील निवडक एकांकिकाचे अध्ययन करणे.
४. भाषिक कौशल्य विकास करणे.

S.Y.B.A.

❖ विषय : भाषिक कौशल्यविकास आणि आधुनिक मराठी साहित्यप्रकार : कादंबरी (CC-1 C)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. कादंबरी साहित्यप्रकाराचे स्वरूप ,घटक,प्रकार आणि वाटचाल समजून घेणे .
२. नेमलेल्या कादंबरीचे आकलन ,आस्वाद आणि विश्लेषण करणे .
३. भाषिक कौशल्यविकास करणे .

S.Y.B.A.

❖ विषय : भाषिक कौशल्यविकास आणि आधुनिक मराठी साहित्यप्रकार : ललित गद्य : (CC-1 D)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. ललित गद्य साहित्यप्रकाराचे स्वरूप ,घटक,प्रकार आणि वाटचाल समजून घेणे .
२. नेमलेल्या कादंबरीचे आकलन ,आस्वाद आणि विश्लेषण करणे .
३. भाषिक कौशल्यविकास करणे

S.Y.B.A.

❖ विषय : आधुनिक मराठी साहित्य –प्रकाशवाटा (DSE-1A) (SEM –3)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. आत्मचरित्र या साहित्यप्रकाराचे स्वरूप ,संकल्पना समजून घेणे .
२. आत्मचरित्र या साहित्यप्रकाराच्या प्रेरणा आणि वाटचाल यांची ओळख करून देणे .

३. ललित गद्यातील अन्य साहित्यप्रकाराचा तुलनेत आत्मचरित्राचे वेगळेपण समजून घेणे .
४. नेमलेल्या या आत्मचरित्राचे आकलन ,आस्वाद विश्लेषण करणे .

S.Y.B.A.

❖ विषय:मध्ययुगीन मराठी साहित्य : निवडक मध्ययुगीन गद्य – पद्य (DSE-2A)(SEM –4)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. मध्यायुगीन गद्य-पद्य साहित्य प्रकारची ओळख करून घेणे.
२. नेमलेल्या अभ्यास पुस्तकातील मध्ययुगीन गद्य-पद्याचे आकलन, आस्वाद आणि विश्लेषण करणे.

S.Y.B.A.

❖ विषय :साहित्य विचार : (DSE-1B) (SEM –3)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. भारतीय आणि पाच्यात्य साहित्य विचाराच्या आधारे साहित्यची संकल्पना स्वरूप आणि प्रयोजन विचार समजून घेणे .
२. साहित्याची निर्मिती प्रक्रिया समजून घेणे.
३. साहित्याची भाषा आणि शैली विषयक विचार समजून घेणे.

S.Y.B.A.

❖ विषय : साहित्य समीक्षा : (DSE-2B) (SEM –4)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. साहित्य समीक्षेची संकल्पना, स्वरूप यांचा परिचय करून घेणे.
२. साहित्य आणि समीक्षा यांचे परस्पर संबंध समजावून घेणे व अभ्यास करणे.
३. साहित्य प्रकारानुसार समीक्षेचे स्वरूप समजावून घेणे व अभ्यासणे.
४. ग्रंथ परिचय, परीक्षण व समीक्षण यातील फरक समजावून घेणे.

S.Y.B.A.

❖ विषय : प्रकाशन व्यवहार आणि संपादन : (SEC – 2A) (SEM –3)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. प्रकाशनव्यवहार आणि संपादन यासाठी आवश्यक कौशल्ये प्राप्त करणे.
२. प्रकाशनव्यवहार आणि संपादन यासाठी आवश्यक प्रशिक्षण घेणे.
३. प्रकाशनव्यवहार आणि संपादन यासाठी आवश्यक प्रात्यक्षिकासह उपयोजनाची कौशल्ये प्राप्त करणे.
४. प्रकाशन संस्था, जाहिरात संस्था, छापखाने, वृत्तपत्र कार्यालये, वितरण संस्था, ग्रंथ विक्री दुकाने, फ्लेक्स निर्मिती केंद्र, वार्ताहर यांना भेटी देऊन प्रशिक्षण घेणे.

S.Y.B.A.

❖ विषय : उपयोजित लेखन कौशल्य : (SEC – 2B) (SEM –4)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. जाहिरात, मुलाखत लेखन आणि संपादन यासाठी आवश्यक कौशल्ये प्राप्त करणे
२. जाहिरात, मुलाखत लेखन आणि संपादन यासाठी आवश्यक प्रशिक्षण घेणे.
३. जाहिरात, मुलाखत लेखन आणि संपादन यासाठी प्रात्यक्षिकासह उपयोजनाची कौशल्ये प्राप्त करणे.

S.Y.B.A.

❖ विषय : मराठी भाषिक संज्ञापन कौशल्ये : (MIL -2) (SEM –3)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. प्रगत भाषिक कौशल्याचे क्षमता विकसित करणे.
२. प्रसार माध्यमातील संज्ञापनातील स्वरूप आणि स्थान स्पष्ट करणे.

३. व्यक्तिमत्व विकास आणि भाषा यांच्यातील सह संबंध स्पष्ट करणे.
४. लोकशाहीतील जीवन व्यवहार आणि प्रसार माध्यमे यांचे परस्पर संबंध स्पष्ट करणे.
५. प्रसार माध्यमांसाठी लेखन क्षमता विकसित करणे.

S.Y.B.A.

❖ विषय : नव माध्यमे आणि समाज माध्यमांसाठी मराठी : (MIL -2) (SEM -4)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. सजापानातील नव माध्यमे आणि समाज माध्यमांचे स्वरूप आणि स्थान स्पष्ट करणे.
२. भाषा, जीवन व्यवहार आणि नव माध्यमे, समाज माध्यमांचे परस्पर सहसंबंध स्पष्ट करणे.
३. नव माध्यमे आणि समाज माध्यमांसाठी लेखन क्षमता विकसित करणे.
४. नव माध्यमे आणि समाज माध्यमाविषयक साक्षरता निर्माण करणे.
५. नव माध्यमे आणि समाज माध्यमांचा वापर आणि परिणाम यांच्या बदल चर्चा करणे.

T.Y.B.A.

❖ विषय : आधुनिक मराठी साहित्य आणि व्यावहारिक व उपयोजित मराठी : (G-3)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. आधुनिक मराठी साहित्यातील विविध साहित्य प्रकारांचा परिचय वाढविणे व आकलन करून घेणे.
२. नेमलेल्या कलाकृतींच्या संदर्भात साहित्य परंपरेचा स्थूल परिचय करून देणे.
३. भाषेचे यथोचित आकलन करण्याची व वापर करण्याची यथायोजित क्षमता विकसित करणे.
४. निबंध व प्रवास वर्णन या साहित्य प्रकारचे तात्विक विवेचन करणे.

T.Y.B.A.

❖ विषय : साहित्य विचार : (S-3)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. साहित्याचे स्वरूप समजून घेणे.
२. साहित्याचे प्रयोजन समजून घेणे.
३. साहित्याची भाषा समजून घेणे.
४. साहित्याची आस्वाद प्रक्रिया समजून घेणे.
५. साहित्याची अभिरुची समजून घेणे.

साहित्य प्रकारची संकल्पना समजून घेणे.

T.Y.B.A.

❖ विषय : भाषा विज्ञान : (S-4)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. भाषेचे स्वरूप व कार्ये, भाषेच्या अभ्यासाचे महत्व समजून घेणे.
२. भाषा म्हणजे काय व तिचे मानवी जीवनातील कार्ये जाणून घेणे.
३. स्वन निर्मितीची प्रक्रिया समजून घेणे.
४. मराठीची रुपिम व्यवस्था समजून घेणे.
५. ऐतिहासिक भाषा पद्धतींचे स्वरूप व महत्व लक्षात घेणे.

F.Y.B.Com.

❖ विषय : भाषा, साहित्य आणि कौशल्यविकास : (११७) (सेमी १)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. विविध क्षेत्रातील भाषाव्यवहाराचे स्वरूप समजून घेणे
२. व्यवहार क्षेत्रातील मराठी भाषेचे स्थान स्पष्ट करणे व त्यातील मराठीच्या प्रत्यक्ष वापराचा अभ्यास करणे

३. विविध क्षेत्रीय मराठी भाषेच्या वापराची कौशल्ये विकसित करणे.

F.Y.B.Com.

❖ विषय :भाषा आणि कौशल्येविकास : (११७) (सेमी २)

अभ्यास क्रमाची उद्दिष्टे :

१. विविध लेखन प्रकारांचा अभ्यास व प्रत्यक्ष लेखनाची कौशल्ये वापरण्यास सक्षम करणे .
२. विविध क्षेत्रातील कर्तृत्ववान व्यक्तींच्या कार्याची विचाराची ओळख करून देणे.
३. विद्यार्थ्यांमध्ये नेतिक व्यावसायिक वैचारिक मुल्यांची जोपासना करणे .

S.Y.B.Sc.

❖ विषय :उपयोजित मराठी : (AECC-2A) सेमी -१

अभ्यास क्रमाची उद्दिष्टे :

१. मराठी भाषा साहित्य यांच्या परस्पर संबंधाची जाणीव करून देणे .
२. मराठी भाषेचा परिभाषा सापेक्ष आणि शेलीसापेक्ष विकास विद्यार्थ्यांच्या लक्ष्यात आणून देणे .
३. मराठी भाषेची उपयोजनात्मक कौशल्ये विकसित करणे .

विषय :मराठी साहित्य : (AECC-2B) सेमी -२

अभ्यास क्रमाची उद्दिष्टे :

- १.साहित्यविषयक अभिरुची विकसित करणे.
२. मराठी भाषा साहित्य यांच्या परस्पर संबंधाची जाणीव करून देणे .
- ३.साहित्यविषयक अभ्यासातून जीवनविषयक समज विकसित करणे.
४. विज्ञान साहित्य विषयक आकलन क्षमता वाढविणे.

➤ **अभ्यासक्रमाचे विद्यार्थ्यांवर होणारे परिणाम (Outcomes) :**

१. विद्यार्थ्यांमध्ये कथा साहित्य बद्दल रुची निर्माण झाली.
२. स्पर्धा परीक्षेच्या दृष्टीने मराठी व्याकरण महत्वपूर्ण ठरले.
३. विद्यार्थ्यांच्या व्यावहारिक ज्ञानात भर पडली.
४. विद्यार्थ्यांमध्ये साहित्य निर्मितीबद्दल जिज्ञासा निर्माण झाली.
५. विद्यार्थ्यांमध्ये साहित्य वाचनाच्या माध्यमातून अवांतर वाचनाची गोडी निर्माण झाली.
६. विद्यार्थ्यांमध्ये दृक-श्राव्य माध्यमांचे ज्ञान विकसित झाले.
७. विद्यार्थ्यांना कार्यालयीन व प्रशासकीय कामकाजासंदर्भात माहिती मिळून व्यावहारिक ज्ञानात भर पडली.
८. विद्यार्थ्यांमध्ये भाषिक प्रेम निर्माण झाले.
९. विद्यार्थ्यांना मराठी साहित्याच्या इतिहासाबद्दल ज्ञान मिळाले.
१०. विद्यार्थ्यांना मराठीतील विविध साहित्य प्रकारांची माहिती मिळाली.

Name of Faculty : Arts

Name of Department : Marathi

P.G. Programme : M.A. I & II

Programme Specific Outcomes

M.A.I (प्रथम सत्र)

❖ विषय :भाषा व्यवहार आणि भाषिक कौशल्य भाग – १ : (CC-1)

अभ्यास क्रमाची उद्दिष्टे :

५. भाषिक जाणीव विकसित करणे.
६. भाषिक कौशल्यात्मक उपाययोजना सिद्ध करणे.
७. मुद्रित शोधनाची विद्यार्थ्यांमध्ये प्रावीण्याची निर्मिती करणे.
८. साहित्य प्रकाशन व्यवसाया संदर्भात जाणीव समृद्ध करणे.

❖ विषय : मराठी वाडमयाचा इतिहास इ.स. १८१८ – १९२० : (CC-2)

अभ्यास क्रमाची उद्दिष्टे :

१. वाडमयीन मूल्यांचे संस्कार करणे.
२. साहित्याचे नेमके आकलन करणे.
३. साहित्य निर्मितीच्या प्रेरणा लक्षात घेणे.
४. वाडमयीन इतिहासाच्या प्रेरणा समजून घेणे.

❖ विषय : ऐतिहासिक भाषा विज्ञान : (CC-3)

अभ्यास क्रमाची उद्दिष्टे :

१. भाषा अभ्यास पद्धतीतून साहित्याच्या अभ्यासाला परिपूर्णता आणून देण्याचा प्रयत्न करणे.
२. भाषिक अभ्यासाद्वारे साहित्याच्या अभ्यासाला परिपूर्णता आणून देण्याचा प्रयत्न करणे.
३. भाषा कुल संकल्पनेतून विद्यार्थ्यांना उपाययोजनेसाठी सिद्ध करणे.

❖ विषय : ग्रामीण साहित्य : (CBOP-4)

अभ्यास क्रमाची उद्दिष्टे :

१. स्वातंत्र्य प्राप्तीनंतरच्या कालखंडात ग्रामीण साहित्याच्या निर्मितीची कारण परंपरा समजून घेणे.
२. ग्रामीण साहित्याचे स्वरूप व कार्ये यांची चिकित्सा करणे.
३. ग्रामीण साहित्यातील विविध वाडमय प्रकारचा विकास कसा होत गेला याचे मूल्यमापन करणे.
४. ग्रामीण साहित्याने दिलेल्या योगदानाची मीमांसा करणे.

M.A.I (द्वितीय सत्र)

❖ विषय : भाषा व्यवहार आणि भाषिक कौशल्य भाग – २ : (CC-5)

अभ्यास क्रमाची उद्दिष्टे :

१. भाषिक व्यवहाराबद्दल जाणीव विकसित करणे.
२. निवेदन कौशल्यात्मक उपाययोजना सिद्ध करणे.
३. दृक श्राव्य माध्यमांची विद्यार्थ्यांमध्ये जागृती निर्माण करणे.

❖ विषय : अर्वाचीन मराठी वाडमयाचा इतिहास इ.स. १९२० – २०१० : (CC-6)

अभ्यास क्रमाची उद्दिष्टे :

१. विशिष्ट कालखंडातील साहित्य निर्मितीच्या प्रेरणा व प्रवृत्ती लक्षात घेऊन साहित्याचे आकलन करणे.
२. जीवन मूल्यांचे संस्कार करणे.
३. या कालखंडातील साहित्य कलाकृतींचे आकलन करणे.

❖ विषय : सामाज भाषा विज्ञान : (CC-7)

अभ्यास क्रमाची उद्दिष्टे :

१. लेखकांच्या समग्र अभ्यासातून लेखकांच्या साहित्य कृतींचे मूल्यमापन करणे.
२. समाजांतर्गत निर्माण झालेल्या नव साहित्याचा स्थूल परिचय करून देणे.

३. साहित्य आणि संस्कृती यांचा परस्पर संबंध लक्षात घेऊन क्षमता व कौशल्य निर्माण करणे.

❖ विषय : दलित साहित्य : (CBOP-8)

अभ्यास क्रमाची उद्दिष्टे :

१. दलित साहित्यातून व्यक्त होणाऱ्या वेदनांचे व विद्रोहाचे स्वरूप समजून घेणे.
२. स्वातंत्र्य प्राप्तीनंतरच्या कालखंडात दलित साहित्याच्या निर्मितीची कारणे परंपरा समजून घेणे.
३. दलित साहित्याने निर्माण केलेल्या विविध साहित्य प्रकारांचे मूल्यमापन करणे.
४. दलित साहित्याने दिलेल्या योगदानाची मीमांसा करणे.

M.A.II (तृतीय सत्र)

❖ विषय : प्रसार माध्यमांसाठी लेखन कौशल्य : (P-09)

अभ्यास क्रमाची उद्दिष्टे :

१. मुद्रित माध्यमांकरिता लेखन कौशल्य आत्मसात करणे.
२. दूरदर्शन माध्यमांचे समाजातील महत्व विशद करणे.
३. श्राव्य माध्यमांसाठी लेखन कौशल्य आत्मसात करणे.

❖ विषय : साहित्य समिक्षा व संशोधन : (P-10)

अभ्यास क्रमाची उद्दिष्टे :

१. साहित्य, समिक्षा व्यवहाराची समाज वाढीस लागणे.
२. समीक्षेची संकल्पना समजून घेणे.
३. समिक्षा व्यवहारातील मुल्यामापनांचा परिचय करून घेणे.
४. मराठी साहित्य समीक्षकांची परंपरा समजून घेणे.

❖ विषय : विशेष लेखकाचा अभ्यास : (P-11)

अभ्यास क्रमाची उद्दिष्टे :

१. एकाच लेखकाचे वाङ्मयीन आकलन करून घेणे.
२. लेखकाचा काळ व चिंतन तत्वाचा मागोवा घेणे.
३. साहित्य निर्मितीचा क्रम लक्षात घेऊन लेखकाच्या साहित्य कृतीचे वाङ्मयीन आकलन करणे.

❖ विषय : लोकसाहित्याची मुलतत्वे आणि मराठी लोकसाहित्य : (P-12)

अभ्यास क्रमाची उद्दिष्टे :

१. लोकसाहित्याचे स्वरूप समजून घेणे.
२. लोकसाहित्याची संकल्पना समजून घेणे.
३. लोकसाहित्याचे अभ्यास क्षेत्र समजून घेणे.
४. लोकसाहित्य व ग्रांथिक साहित्य यातील साम्यभेद समजून घेणे.

M.A.II (चतुर्थ सत्र)

❖ विषय : प्रसार माध्यमांसाठी लेखन कौशल्य : (P-13)

अभ्यास क्रमाची उद्दिष्टे :

१. प्रसारमाध्यमांचे समाजातील महत्व विशद करणे.
२. प्रसारमाध्यमांकरिता लेखनकौशल्य आत्मसात करणे.
३. प्रसारमाध्यमांत सेवेची संधी मिळविण्यासाठी विद्यार्थ्यांची भाषिक क्षमता विकसित करणे.

❖ विषय : साहित्य समिक्षा व संशोधन : (P-14)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. संशोधनाची संकल्पना, प्रयोजने आणि विविध संशोधन पद्धती समजावून घेणे.
२. वाडमयीन संशोधनाच्या विविध अभ्यास क्षेत्रांचा परिचय करून देणे.
३. आंतरविद्याक्षेत्रीय संशोधनाचे स्वरूप आणि महत्व लक्षात घेणे.
४. मराठी साहित्य संशोधनाची परंपरा समजावून घेणे.

❖ विषय : विशेष लेखकाचा अभ्यास : (P-15)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. लेखकाच्या व्यक्तिमत्वाची जडण घडण, सांस्कृतिक व वाडमयीन निर्मिती समजावून घेणे.
२. विविध वाडमय कृतीतून लेखकाचे योगदान व त्याचे तौलनिक आकलन करणे.
३. एकाच लेखकाचे वाडमयीन आकलन करून घेणे.
४. लेखकाचा काळवत्याची साहित्यनिर्मिती यातील सहसंबंधाचा मागोवा घेणे.
५. साहित्य निर्मितीचा क्रम लक्षात घेउन लेखकाच्या साहित्य कृतीचे वाडमयीन आकलन करणे.

❖ विषय : लोकसाहित्याची मुलतत्वे आणि मराठी लोकसाहित्य : (P-16)

अभ्यास क्रमाची उद्दिष्ट्ये :

१. लोकसाहित्याचे स्वरूप समजून घेणे.
२. लोकसाहित्याची व्यापकता व सर्वसमावेशकता लक्षात आणून देणे.
३. लोकसाहित्यातील विविध प्रकार समजून घेणे.
४. लोकसाहित्यातील सामाजिक, धार्मिक, सांस्कृतिक जाणीव स्पष्ट करणे.

➤ **अभ्यासक्रमाचे विद्यार्थ्यांवर होणारे परिणाम (Outcomes) :**

१०. विद्यार्थ्यांमध्ये लोकसाहित्याबद्दल रुची निर्माण झाली.
११. विद्यार्थ्यांच्या ज्ञानात संत साहित्याबद्दल भर पडली.
१२. विद्यार्थ्यांमध्ये साहित्य निर्मितीबद्दल जिज्ञासा निर्माण झाली.
१३. विद्यार्थ्यांमध्ये मुद्रित माध्यम बद्दल आकलन झाले.
१४. विद्यार्थ्यांमध्ये दृक-श्राव्य माध्यमांबद्दल रुची निर्माण झाली
१५. विद्यार्थ्यांना जाहिरातीबद्दल व वृत्तासंकलना द्दल माहिती मिळून व्यावहारिक ज्ञानात भर पडली.
१६. साहित्यिक अभ्यासामुळे विद्यार्थ्यांमध्ये समीक्षात्मक दृष्टीकोन निर्माण झाला.
१७. विद्यार्थ्यांमध्ये संशोधनात्मक दृष्टीकोन निर्माण झाला
१८. विद्यार्थ्यांमध्ये भाषिक प्रेम निर्माण झाले.
- १० विद्यार्थ्यांना मराठी साहित्याच्या इतिहासाबद्दल ज्ञान मिळाले.

Name of Faculty : Arts

Name of Department : Hindi

U.G. Programme : F.Y.B.A./ F.Y.B.Com/S.Y.B.A./S.Y.B.Sc/

T.Y.B.A.

पाठ्यक्रम : वैकल्पिक हिन्दी प्रश्नपत्र : 1 A -F.Y.B.A. (Hindi – G1) (SEM 1)

पाठ्यक्रम का उद्देश :

१. छात्रो को हिन्दी काव्य साहित्य का परिचय देना ।
२. हिन्दी किानी साहित्य से अवगत किाना ।
३. हिन्दी भाषा द्वारा संवाद कौशल हवकहसत किना ।
४. मौहलक लेखन की और रुझान बढाना ।
५. हवज्ञापन लेखन कौशल हवकहसत किना ।
६. अनुवाद संबंधी जानकारी देना ।
७. हिन्दी कॉम्पुटि का परिचय देना ।
८. हनबंध लेखन कौशल को हवकहसत किना ।

९. छात्रों को हवज्ञापन लेखन से अवगत किना ।

पाठ्यक्रम : वैकल्पिक हिन्दी प्रश्नपत्र : 1 A -F.Y.B.A. (Hindi – G1) (SEM 2)

पाठ्यक्रम का उद्देश :

१. छात्रों को हिन्दी काव्य साहित्य का परिचय देना ।
२. हिन्दी किानी साहित्य से अवगत करना ।
३. विज्ञापन लेखन कौशल विकसित करना ।
४. हनबंध लेखन कौशल को विकसित करना ।

† **पाठ्यक्रम : वैकल्पिक हिन्दी प्रश्नपत्र : 1 A -F.Y.B.Com. (Hindi – G1) (SEM 1)**

पाठ्यक्रम का उद्देश :

१. छात्रों को हिन्दी काव्य साहित्य का परिचय देना ।
२. हिन्दी कहानी साहित्य से अवगत करना ।
३. हिन्दी भाषा द्वारा संवाद कौशल विकसित करना ।
४. मौलिक लेखन की और रुझान बढ़ाना ।
५. अनुवाद लेखन कौशल विकसित करना ।
६. हिन्दी कम्प्युटर का परिचय देना ।

† **पाठ्यक्रम : वैकल्पिक हिन्दी प्रश्नपत्र : 1 B -F.Y.B.Com. (Hindi – G1) (SEM 2)**

पाठ्यक्रम का उद्देश :

१. छात्रों को हिन्दी काव्य साहित्य का परिचय देना ।
२. हिन्दी किानी साहित्य से अवगत किना ।
३. हिन्दी भाषा द्वारा संवाद कौशल विकसित करना ।
४. अनुवाद का स्वरूप से अवगत करना ।
५. पारिभाषिक शब्दावलीसे अवगत करना ।

† **पाठ्यक्रम : विशेष हिन्दी प्रश्नपत्र : 1 DSC – 1A - S.Y.B. A. (Hindi – S1)**

काव्यशास्त्र सामान्य (SEM – III)

पाठ्यक्रम का उद्देश :

१. भारतीय काव्यशास्त्र का परिचय देना ।
२. काव्य परिभाषा, तत्व आदी अवगत किना ।
३. काव्य के तत्व, शब्दशक्तियों का परिचय देना ।
४. रस का स्वरूप समझाना ।
५. काव्यशास्त्र में रुची पैदा करना तथा आलोचनात्मक दृष्टी को विकसित करना ।

पाठ्यक्रम : विशेष हिन्दी प्रश्नपत्र : 1 DSC – 1B - S.Y.B. A. (Hindi – S1)

साहित्य के भेद (SEM – IV)

पाठ्यक्रम का उद्देश :

१. छात्रों को साहित्य के भेद से अवगत करना
२. छात्रों को पद्य भेद से अवगत करना ।
३. महाकाव्य, खंडकाव्य और मुक्तक काव्य का परिचय करना ।
४. नाटक का स्वरूप समझाना ।
५. छात्रों में नाट्य अभिनय की रुची विकसित करना ।

† पाठ्यक्रम : विशेष हिंदी प्रश्नपत्र : 2 DSC – 2A S.Y.B. A. (Hindi – S2)

मध्ययुगीन काव्य तथा उपन्यास साहित्य (SEM – III)

पाठ्यक्रम का उद्देश :

१. कबीर के साहित्य का परिचय देना ।
२. मीराबाई के काव्य से अवगत करना ।
३. भारतीय उपन्यास की अवधारणा समझाना ।
४. उपन्यास कृती का मूल यांकन कला विकसित करना ।
५. साहित्यकृतियों प्रस्तुत जीवन मुल्यो को आत्म विस्तृत करना ।

पाठ्यक्रम : विशेष हिन्दी प्रश्नपत्र : 2 DSC – 2B S.Y.B. A. (Hindi – S2)

मध्ययुगीन काव्य तथा नाटक (SEM – IV)

पाठ्यक्रम का उद्देश :

१. रहीम के काव्य का बोध करना ।
२. बिहारी की काव्य अभिव्यान्जना समझाना ।
३. हिन्दी नाटक और रंगमंच से अवगत करना ।
४. छात्रो मे अभिनय गुण विकसित करना ।
५. नाट्यलोचना से अवगत करना ।

† पाठ्यक्रम : सामान्य हिन्दी प्रश्नपत्र : CC- 1C S.Y.B. A. (Hindi – G2)

आधुनिक काव्य, कहानी तथा व्यावहारिक हिन्दी (SEM – III)

पाठ्यक्रम का उद्देश :

१. छात्रो को काव्य साहित्य से अवगत करना ।
२. छात्रो को कहानी साहित्य से अवगत करना ।
३. छात्रो मे लेखन कौशल विकसित करना ।
४. छात्रो मे कहाणी लेखन कौशल विकसित करना ।
५. छात्रो को हिन्दी कारक\ व्यवस्था समझाना ।
६. शब्द युग्म का अर्थ लिखकर प्रत्यक्ष वाक्य मे प्रयोग समझाना ।
७. संक्षेपन लेखन का प्रत्यक्ष बोध करना ।

† पाठ्यक्रम : सामान्य हिन्दी प्रश्नपत्र : CC- 1D S.Y.B. A. (Hindi – G2)

आधुनिक हिन्दी व्यंग्य साहित्य तथा व्यावहारिक हिन्दी (SEM – IV)

पाठ्यक्रम का उद्देश :

१. छात्रो को व्यंग्य पाठ से परिचीत करना ।
२. छात्रो को कहानी व्यंग्य पाठ का बोध करना ।
३. साक्षात्कर कला से अवगत करना ।
४. भाषा का मोबाईल तंत्र समझाना ।
५. पललवन कला से अवगत करना ।

† पाठ्यक्रम : हिन्दी प्रश्नपत्र : SEC- 2A S.Y.B. A.

अनुवाद स्वरूप एवं व्यवहार (SEM – III)

पाठ्यक्रम का उद्देश :

१. अनुवाद कौशल से छात्रो को अवगत करना ।
२. अनुवाद का स्वरूप समझाना ।

३. अनुवाद क्षेत्र से परिचय करना ।
४. हिन्दी से मराठी में प्रत्यक्ष अनुवाद करना ।
५. अंग्रेजी से हिन्दी, मराठी में अनुवाद कौशल का विकसित करना ।

† **पाठ्यक्रम : हिन्दी प्रश्नपत्र : SEC- 2B S.Y.B. A.**

माध्यम लेखन (SEM – IV)

पाठ्यक्रम का उद्देश :

१. छात्रों को माध्यम लेखन से परिचित करना ।
२. सृजनात्मक लेखन कौशल विकसित करना ।
३. माध्यम लेखन से अवगत करना ।
४. श्रव्य – दृश्य मध्यमों की भाषा से अवगत करना ।

† **पाठ्यक्रम : सामान्य हिन्दी प्रश्नपत्र : AECC-2A S.Y.B. BSc. (Hindi – G2)**

हिन्दी काव्य तथा कहानी साहित्य (SEM III)

पाठ्यक्रम का उद्देश :

१. छात्रों को काव्य साहित्य से अवगत करना ।
२. छात्रों को कहानी साहित्य से अवगत करना ।
३. छात्रों में काव्य लेखन कौशल विकसित करना ।
४. छात्रों में कहानी लेखन कौशल विकसित करना ।

† **पाठ्यक्रम : सामान्य हिन्दी प्रश्नपत्र : AECC-2B S.Y.B. BSc. (Hindi – G2)**

हिन्दी काव्य तथा कहानी साहित्य (SEM IV)

पाठ्यक्रम का उद्देश :

१. छात्रों को काव्य साहित्य से अवगत करना ।
२. छात्रों को कहानी साहित्य से अवगत करना ।
३. छात्रों में काव्य लेखन कौशल विकसित करना ।
४. छात्रों में कहानी लेखन कौशल विकसित करना ।

†

पाठ्यक्रम : हिन्दी भाषा लक्ष्य (MIL): S.Y.B. A (Arts Faculty) (SEM III)

पाठ्यक्रम का उद्देश :

१. छात्रों में हिन्दी भाषा श्रवण कौशल विकसित करना ।
२. छात्रों में हिन्दी भाषा संवाद कौशल विकसित करना ।
३. छात्रों में हिन्दी भाषा वाचन कौशल विकसित करना ।
४. छात्रों में हिन्दी भाषा लेखन कौशल विकसित करना ।
५. हिन्दी भाषा हवधी तथा भाषा – व्यवहार से अवगत करना ।
६. लघुकथा सृजन कौशल विकसित करना ।

† **पाठ्यक्रम : हिन्दी भाषा शिक्षण (MIL) : S.Y.B. A (Arts Faculty) (SEM IV) पाठ्यक्रम का उद्देश :**

१. छात्रों को वाक्य के भेद से अवगत करना ।
२. छात्रों में विशेष प्रकार के वाक्यों से परिचित करना ।
३. छात्रों में हिन्दी भाषा श्रवण कौशल विकसित करना ।
४. छात्रों में हिन्दी भाषा संवाद कौशल विकसित करना ।

५. छात्रों में हिन्दी भाषा वाचन कौशल विकसित करना।
६. छात्रों में हिन्दी भाषा लेखन कौशल विकसित करना।
७. हिन्दी भाषा विधी तथा भाषा – व्यवहार से अवगत करना।
८. हिन्दी काव्य गीत सृजन कौशल विकसित करना।

Name of Faculty : Arts

Name of Department : Hindi

P.G.Programme : M.A. Part – I & Part – II

Programme Specific Outcomes

☛ **पाठ्यचर्या:** शोध प्रबन्ध (M.A. Part -1)

पाठ्यक्रम का उद्देश :

१. छात्रों को शोध प्रवृत्त से अवगत करना।
२. शोध दृष्टि का विकास करना।

☛ **पाठ्यचर्या :. पाश्चात्य काव्यशास्त्र** (M.A. Part -1)

पाठ्यक्रम का उद्देश :

१. पाश्चात्य काव्यशास्त्र के विकासक्रम का परिचय देना।
२. पाश्चात्य हचंतको के हचंतन, हसद्दांत औ प्रमुख आंदोलनों से अवगत करना।
३. छात्रों को सृजन, आस्वादन एवं आलोचना दृष्टि देना।

☛ **पाठ्यचर्या : (वैकल्पिक) हिंदी उपन्यास साहित्य** (M.A. Part -1)

पाठ्यक्रम का उद्देश :

१. हिन्दी उपन्यास साहित्य के विकासक्रम एवं प्रवृत्तियों से परिचित करना।
२. उपन्यासों के आस्वादन, अध्ययन की क्षमता विकसित करना।
३. पाठ्य चिन्ताओं में प्रस्तुत साहित्यिक मूल्यों का संप्रेषण करना।
४. मूल पाठकों की दृष्टि का विकसित करना।

पाठ्यचर्या :. सामान्य स्ति – आधुनिक काव्य (M.A. Part -2)

पाठ्यक्रम का उद्देश :

१. छात्रों को आधुनिक काव्य से परिचित करना।
२. छात्रों में आधुनिक काव्य – अध्ययन की दृष्टि विकसित करना।
३. काव्य मूल पाठकों – दृष्टि विकसित करना।
४. काव्य – संवेदना एवं हशल पगत अध्ययन से छात्रों को अवगत करना।
५. छात्रों में काव्य – सज्जन कला विकसित करना।

☛ **पाठ्यचर्या :. भाषा विज्ञान** (M.A. Part -2)

पाठ्यक्रम का उद्देश :

१. भाषा विज्ञान के स्वरूप का परिचय देना।
२. भाषा विज्ञान की व्याक्ति समझना।
३. भाषा विज्ञान अध्ययन की हदशाओं का परिचय देना।
४. भाषा विज्ञान के अनुप्रयोगात्मक पक्ष को समझना।
५. साहित्य – अध्ययन में भाषा हवज्ञान की उपयोगिता समझना।

† पाठ्यचर्या : . (वैकल्पिक) – क) हिन्दी आलोचना (M.A. Part -2)

पाठ्यक्रम का उद्देश :

1. अलोचना के स्वरूप एवं विविध प्रकार से अवगत करना ।
2. हिन्दी के प्रमुख आलोचको के आलोचनात्मक प्रहतमानो का परिचय देना ।
3. साहित्यालोचन एवं व्यावहारिक सहमक्षा दृष्टी विकसित करना ।

† पाठ्यचर्या : . आधुनिक कविता (M.A. Part -2)

पाठ्यक्रम का उद्देश :

1. छात्रो को आधुनिक हिन्दी काव्य की प्रवृहियो का परिचय करना ।
2. छात्रो मे आधुनिक काव्य अध्ययन की दृष्टी विकसित करना ।
3. सृजनात्मक कौशल से अवगत करना ।
4. आलोचनात्मक दृष्टी हवकहसत करना ।

† पाठ्यचर्या :. हिन्दी भाषा का विकास (M.A. Part -2)

पाठ्यक्रम का उद्देश :

1. हिन्दी भाषा की ऐतिहासिक पृष्ठभूमी का परिचय देना ।
2. आधुनिक आयथ भाषाओ का परिचय देना ।
3. हिन्दी के स्वनीम व्यवस्था का परिचय देना ।
4. हिन्दी की रूपिना से अवगत करना ।
5. हिन्दी भाषा के योगदान से अवगत करना ।

† पाठ्यचर्या : . हिन्दी साहित्य का इतिहास (M.A. Part -2)

पाठ्यक्रम का उद्देश :

1. हिन्दी गद्य के उद्वाव और विकास से छात्रो को अवगत करना ।
3. ऐतिहासिकक दृष्टी विकसित करना ।

† पाठ्यचर्या : (वैकल्पिक) – क) भारतीय लोकसाहित्य (M.A. Part -2)

पाठ्यक्रम का उद्देश :

1. लोकसाहित्य के स्वरूप तथा उसके मित्व से परिचीत करना ।
2. लोकसाहित्य की हवहवध विधाओ की जानकारी देना ।
3. लोकसाहित्य की व्यापकता समझाना ।
4. महाराष्ट्र के लोकसाहित्य से परिचित करणा ।

Department of Economics

Name of Faculty	Mental, Moral & Social Sciences
Name of Department	Economics
UG Programme	BA
Course Outcomes (CO) T.Y.B.A.	
<u>Economic Development & Planning</u>	
1. To learn Indian Economy	
2. To Learn Planning	
3. To create EconomicsDevelopment Knowledge	

Public Finance

- 1.To learn Indian Budget System
- 2.To study Tax & Income
- 3.To develop a Indian Finance Knowledge
- 4.To learn Politics Role in Economy

International Economics

- 1.To develop understanding the process of World Economy
2. To Understand India Role in World Economy
3. To Understand Global And Indian Economy

Course Outcomes (CO) S.Y.B.A**Modern Banking**

- 1.To Understand the information about the Bank
- 2.To Understand how money is made
- 3.To Understand the information of RBI

Micro Economics

1. Develop practical knowledge in own Economics Decision
2. To Understand Business Principal
3. To Learn basic Economics.

Macro Economics

- 1.To understand how the economy operates
- 2.To understand how Economics Principal Apply
- 3.To learn basics Economics Theory

Basic Concept of Research Methodology

1. To understanding what is research
2. To understand the methods of data collection
3. To understand how to analyze information
4. To understand the objectives of the research

Course Outcomes (CO) F.Y.B.A**Indian Economic Environment**

- 1.To Understand the information about the Indian Economy
- 2.To Understand important of employment in Indian Economy
- 3.To Understand the important of Agriculture in Indian Economy

Name of Faculty : Arts

Name of Department : Philosophy & Logic

U.G. Programme : T.Y.B.A.

Course Outcomes

1. Class : TYBA Philosophy (2019 CBCS Pattern)

Semester V& VI

Course : Aesthetics and Religious Philosophy (Semester- V)

Objectives :

1. To introduce the students with theories and problems in realm with Aesthetics and Religious Philosophy.
2. To acquaint the students with rich Aesthetics and Religious Philosophical heritage,
3. To familiar to the students with various views and perspectives of various thinkers.

Outcomes :

1. To attract the attention of the students to words great heritage of Beauty, Art and Religion.
2. Aim to prepare eminent personality, thinkers, artist and devotee of religion.

Course : Socio-Political Philosophy (Semester- VI)

Objectives:

1. To introduce to the students Social and Political Philosophy as a branch of

Philosophy.

2. To aware the students with Socio-Political theories and Perspectives of such a

discourse.

3. To acquaint the students with issues and problem solving methods in such a realms. **Outcomes:**

1. To educate the students how to study and find the remedies on socio-Political issues with the help of Philosophizing.

2. To prepare leadership of Philosopher king through syllabic conversation

2. Class : TYBA Logic (2019 CBCS Pattern)

Semester V& VI

Course : Logic and Methodology of science – I (Semester- V)

Objectives:

1. To teach students to acquire pleasures in logical thinking for social research.
2. To acquaint the student with the principles and techniques of hypothesis.
3. To acquaint the student with the principles and techniques of causation techniques.
4. To create awareness about the significance of logical thinking for academics and life in general.
5. To prepare students for university evaluation system and competitive examination.

Outcome:

1. To know and remember specific facts, terms, concepts, principles or theories.
2. To understand, interpret, compare, contrast, explain
3. To apply knowledge to new situation to solve problems using required knowledge or skills.

Course : Logic and Methodology of Science – II (Semester- VI)

Objectives:

1. To acquaint the student with explanation theory and techniques.
2. To equip students with the objectivity and value neutrality logic.
3. To acquaint the student to the pleasures in logical thinking.

Outcome:

1. To know and remember specific facts, terms, concepts, principles or theories.
2. To understand, interpret, compare, contrast, explain
3. To apply knowledge to new situation to solve problems using required knowledge or skills.

Name of Faculty – Commerce

F.Y.B.COM.

Semester: I

A. Financial Accounting- I

Course Code – 112 No. of Credits :- 03 and for practical – 01

Objective of the Course:-

1. To impart knowledge of basic accounting concepts
2. To create awareness about application of these concepts in business world

3. To impart skills regarding Computerised Accounting
4. To impart knowledge regarding finalization of accounts of various establishments.

Course Outcomes:-

1. Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry. Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.
2. To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated to developing tomorrow's leaders, managers, and professionals.
3. The existing education system of imparting commerce education needs to be more dynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.
4. The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.
5. The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students to opt for additional courses where he /she can score more than the required credits.

B. Business Economics (Micro) – I

Course Code – 113 No. of Credits :- 03

Objectives of the course:-

1. To impart knowledge of business economics
2. To clarify micro economic concepts
3. To 2rganis and interpret charts and graphs
4. To understand basic theories, concepts of micro economics and their application

Course Outcomes:-

1. Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry. Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.
2. To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated to developing tomorrow's leaders, managers, and professionals.
3. The existing education system of imparting commerce education needs to be more dynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.
4. The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.
5. The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students to opt for additional courses where he /she can score more than the required credits.

C. Computer Concepts and Application – I

Course Code – 114 (B) No. of Credits :- 03

Objective:

1. To make the students familiar with Computer environment.
2. To make the students familiar with the basics of Operating System and business communication tools.
3. To make the students familiar with basics of Network, Internet and related concepts.
4. To make awareness among students about applications of Internet in Commerce.
5. To enable make awareness among students about e-commerce and M commerce.

Course Outcomes:-

1. Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry. Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.
2. To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated to developing tomorrow's leaders, managers, and professionals.
3. The existing education system of imparting commerce education needs to be more dynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.

4. The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.

5. The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students to opt for additional courses where he /she can score more than the required credits.

D. Organizational Skills Development- I

Course Code – 115 – A No. of Credits :- 03

Objectives of the course

1. To introduce the students to the emerging changes in the modern office environment
2. To develop the conceptual , analytical , technical and managerial skills of students efficient office organization and records management
3. To develop the organizational skills of students
4. To develop Technical skills among the students for designing and developing effective means to manage records , consistency and efficiency of work flow in the administrative section of an 5rganisation
6. To develop employability skills among the students

Course Outcomes:-

1. Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry. Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.
2. To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated to developing tomorrow's leaders, managers, and professionals.
3. The existing education system of imparting commerce education needs to be more dynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.
4. The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.
5. The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students to opt for additional courses where he /she can score more than the required credits.

E. BANKING & FINANCE- I

(Fundamentals of Banking I)

Course Code – 115 – B No. of Credits :- 03

Objectives –

1. To provide knowledge of fundamentals of Banking
2. To create awareness about various banking concepts
3. To conceptualize banking operations.

Course Outcomes:-

1. Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry. Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.
2. To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated to developing tomorrow's leaders, managers, and professionals.
3. The existing education system of imparting commerce education needs to be more dynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.
4. The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.
5. The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students to opt for additional courses where he /she can score more than the required credits.

F. Business Environment & Entrepreneurship – I

Course Code – 116 – E No. of Credits :- 03

Objectives of the course:

- 1) To understand the concept of Business Environment and its aspects
- 2) To make students aware about the Business Environment issues and problems of Growth

- 3) To examine personality competencies most common to majority of successful entrepreneurs and to show how these competencies can be developed or acquired
- 4) To understand the difference between Entrepreneurial and non-Entrepreneurial behaviour
- 5) To provide knowledge of the significance of Entrepreneurship in economy
- 6) To familiarize the students with the contribution of selected institutes working

Course Outcomes:-

1. Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry. Commerce education is entirely different from other disciplines. Hence, it must chart Course routes to service the aspirations of the nation.
2. To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated to developing tomorrow's leaders, managers, and professionals.
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F.Y.B.COM.

Semester-II,

A. Subject Name: - Financial Accounting- II Course Code - 122

Objective of the Program

1. To impart knowledge of various software used in accounting
2. To impart knowledge about final accounts of charitable trusts
3. To impart knowledge about valuation of intangible assets
4. To impart knowledge about accounting for leases

Course Outcomes:-

1. Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry. Commerce education is entirely different from other disciplines. Hence, it must chart Course routes to service the aspirations of the nation.
2. To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated to developing tomorrow's leaders, managers, and professionals.
3. The existing education system of imparting commerce education needs to be more dynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.
4. The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.
5. The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students to opt for additional courses where he /she can score more than the required credits.

Semester-II Course Code - 123

B. Business Economics (Micro) - II

Objectives:

1. To understand the basic concepts of micro economics.
2. To understand the tools and theories of economics for solving the problem of decision making by consumers and producers.
3. To understand the problem of scarcity and choices.

Course Outcomes:-

1. Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry. Commerce education is entirely different from other disciplines. Hence, it must chart Course routes to service the aspirations of the nation.
2. To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated to developing tomorrow's leaders, managers, and professionals.
3. The existing education system of imparting commerce education needs to be more dynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.

4. The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.

5. The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students to opt for additional courses where he /she can score more than the required credits.

C. Computer Concepts & Applications - II Course Code -124 (B)

Objective:

1. To make the students familiar with Computer environment.
2. To make the students familiar with the basics of Operating System and business communication tools.
3. To make the students familiar with basics of Network, Internet and related concepts.
4. To make awareness among students about applications of Internet in Commerce.
5. To enable make awareness among students about e-commerce and M commerce.

Course Outcomes:-

6. Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry. Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.

7. To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated to developing tomorrow's leaders, managers, and professionals.

8. The existing education system of imparting commerce education needs to be more dynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.

9. The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.

10. The choice based credit system offers a cafeteria approach where the students have the liberty to choose courses of their own choice. The credit system allows students to opt for additional courses where he /she can score more than the required credits.

4. To make the students familiar with basics of Network, Internet and related concepts.

5. To make awareness among students about applications of Internet in Commerce.

D. Subject : - Organizational Skill Development- II Course Code - 125 (A)

Objectives of the course

1. To imbibe among the students the qualities of a good manager and develop the necessary skill sets
2. To develop the technical skills of the students to keep up with the technological advancements and digitalization
3. To develop the communication skills of students and introducing them to the latest tools in communication
4. To develop writing, presentation, interpersonal skills of the students for effective formal corporate reporting.
5. To educate the students on the recent trends in communication technology and tools of office automation

Course Outcomes:-

1. Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry. Commerce educationist entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.

2. To meet the growing needs of the business society, there is greater demand for sound development of commerce education. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India. The Commerce education is dedicated to developing tomorrow's leaders, managers, and professionals.

3. The existing education system of imparting commerce education needs to be more dynamic to incorporate all local and global changes in the field of trade and commerce. The curriculum needs to be restructured accordingly.

4. The learning inputs are required to be more update, skill based and with appropriate applications. This will be achieved through the introduction of Choice based Credit System at undergraduate level.

Name of Faculty	Commerce
Name of Department	Commerce and Management
UG Programme	Bachelor of Business Administration- B.B.A.
Course Outcomes (CO) F.Y.B.B.A. (Choice Based Credit System - CBCS)	

101: Principles of Management

1. To understand basic concept regarding org. Business Administration
2. To examining how various management principles
3. To develop managerial skills among the students

102. Business Communication

1. To understand what is the role of communication in personal and business world
2. To understand system and communication and their utility
3. To develop proficiency in how to write business letters required in business

103. Business Accounting

1. To develop right understanding role and importance of monetary & financial transactions in business
2. To cultivate right approach towards classifications of different transactions and their implications
3. To develop proficiency preparation of basic financial as to how to write basis accounting statement - Trading and P&L

104. Business Economics-Micro

1. To understand role of economics as it influences society and business
2. To study how different decisions are taken in relation to price demand and supply
3. To develop right understanding regarding Monopoly, perfect competition, revenue Etc.

105. Business Mathematics

1. To develop appropriate understanding as how to use mathematic like computation interest, profit etc.
2. To cultivate right understanding regaining numerical aptitude
3. To develop logical approach towards analytical approach data

106. Business Demography

1. To give proper understanding regarding concept of demography in modern economic setup
2. To study how population and structure changes affecting quality of life and business
3. To develop clarity of concept regarding social economic process & urbanization and its impact on society

201. Business Organizations and Systems

1. To understand role and functions of modern business
2. To develop right understanding regarding business environment
3. To study how a business institution functions in a given economic set up

202. Principles of Marketing

1. To develop write understanding regarding marketing environment in the country
2. To develop appropriate conceptual understanding as to develop basic marketing concept
3. To develop new understanding regarding services, rural marketing and new trends in marketing

203. Principles of Finance

1. To cultivate right approach towards money, finance, and their role in business
2. To develop right understanding regarding various sources of finance & their role & utility in business
3. To develop basic skills as to concept of capital structure and concept of capital structure

204. Basics of Cost Accounting

1. To develop rational understanding regarding concept of cost expenditure in business

2. To develop understanding how overheads influence the cost structure of cost
3. To develop skills for computation of total cost for a particular product

205. Business Statistics

1. To understand role and importance of statistics in various business situations
2. To develop skills related with basic statistical technique
3. Develop right understanding regarding regression, correlation and data interpretation

206. Fundamentals of Computers

1. To develop concept of information and their role in modern businesses
2. To develop rational approach as to how computers can be used in data process analysis in business
3. To develop understanding regarding cautions to be taken security, safety and security while using net based service

Course Outcomes (CO) S.Y.B.B.A.

301. Principles of Human Resource Management

1. To introduce the basic concepts of Human Resource Management.
2. To cultivate right approach towards Human Resource and their role in business.
3. To create awareness about the various trends in HRM among the students.

302. Supply Chain Management

1. To enable the students to have a comprehensive understanding of Supply Chain Management.
2. To understand key concepts and issues of Logistics and Inventory Management.
3. To understand Warehousing and its role in Space Management.

303. Global Competencies and Personality Development

1. To build self-confidence, enhance self-esteem, and improve overall personality of the students.
2. To enhance global and cultural competencies of the students.
3. To groom the students for appropriate behaviour in social and professional circles.

304. Fundamentals of Rural Development

1. To understand the development issues related to rural society.
2. To find the employment opportunities for rural youth.
3. To create interest among the rural youth to participate in rural development programmes and schemes for sustainable development.
4. To discourage seasonal and permanent migration to urban areas.

A 305 MM. Consumer Behaviour & Sales Management

1. To develop significant understanding of Consumer behaviour in Marketing.
2. To understand the relationship between consumer behaviour & Sales Management.
3. To develop conceptual based approach towards decision making aspects & its implementation considering consumer behaviour in Sales Management.

A 306 MM. Retail Management

1. To provide basic understanding of forces that shape retail industry.
2. To provide understanding of retail operations and strategy.
3. To provide understanding of opportunities and challenges in retail industry

B 305 FM. Management Accounting

1. To impart basic knowledge of management accounting.
2. To understand the implications of various financial ratios in decision making.
3. Application and use of various tools of management accounting in the business.

B 306 FM. Banking & Finance

1. Study of banking function and its operations.
2. To study the functioning of Regulatory Authorities in India.
3. To study recent technology in banking industry.

401. Entrepreneurship and Small Business Management

1. To understand the concept and process of Entrepreneurship.
2. To Acquire Entrepreneurial spirit and resourcefulness.
3. To get acquainted with the concept of Small Business Management.
4. To understand the role and contribution of Entrepreneurs and Small Businesses in the growth and development of individual and the nation.

402. Production and Operation Management

1. To understand the key concepts of Production and Operation Management.
2. To understand the various manufacturing methods and role in managing business.
3. To create awareness about the various safety measures and ergonomics in industries.

403. Decision Making and Risk Management

1. To learn the key topics in decision making and risk management so that they can improve decision making and reduce risk in their management activities and organizations.
2. Find the best alternative in a decision with multiple objectives and uncertainty.
3. Describe the process of making a decision.
4. Analyze an organization's decision-making system.
5. Develop a risk management process.

404. International Business Management

1. To acquaint the students with emerging trends and issues in International Business.
2. To study the impact of International Business Environment on foreign market operations.
3. To analyze International trade models.
4. To analyze the International Investment and its risks associated.
5. To understand financial aspects in world economies, their need and functionality

A 405 MM. Advertising and Promotion Management

1. To develop knowledge and understanding of importance of advertising.
2. To understand different sales promotion techniques.
3. To know about promotion management.

A 406 MM. Digital Marketing

1. To provide students with the Knowledge about business advantages of the digital marketing and its importance for marketing success.
2. To help students become in demand professional by being acquainted through various Digital channels & their ways of Integration.
3. To get Basic Knowledge of Google Analytics for measuring effects of Digital Marketing & getting Insights of Future trends that will affect the future development of the digital marketing

B 405 FM. Business Taxation

1. To understand different concepts & definitions under Income Tax Act 1961.
2. To understand the importance of Taxation to the students.
3. To update the students with the latest development in the subject of Taxation.

B 406 FM. Financial Services

1. To Study in detail financial services in India.
2. To study & Understand working of Indian financial system.
3. To make the students well acquainted regarding financial markets.

Course Outcomes (CO) T.Y.B.B.A.

501: Supply Chain and Logistics Management

1. To introduce the fundamental concepts in Materials and Logistics Management
2. To familiarize with the issues in core functions in materials and logistics management

502: Entrepreneurship Development

1. To create entrepreneurial awareness among the students.
2. To help students to up bring out their own business plan.
3. To develop knowledge and understanding in creating and managing new venture.

503: Business Law

1. To understand basic legal terms and concepts used in law pertaining to business
2. To comprehend applicability of legal principles to situations in Business world by referring to few decided leading cases.

504: Research Methodology

1. To provide the students with basic understanding of research process and tools for the same.
2. To provide an understanding of the tools and techniques necessary for research and report writing.

505 - A: Analysis of Financial Statements

1. This course is designed to prepare students for interpretation and analysis of financial statements effectively
2. To make the student well acquainted with current financial practices
3. This course is designed primarily for students who expect to be intensive users of financial statements as part of their professional responsibilities.

505 -B: Sales Management

1. To provide the students with basic understanding of the processes and skills necessary to be successful in personal selling and insights about recent trends in sales management
2. To provide an understanding of the tools and techniques necessary to effectively manage the sales function - organization - sales individual.
3. 3. To provide students with advanced skills in the areas of interpersonal communications, Motivational techniques

506 – A: Long Term Finance

1. To make the study of long-term financing
2. To make the student well-acquainted regarding current financial structure

506 – B: Retail Management

1. To provide insights into all functional areas of retailing.
2. To give a perspective of the Indian retail scenario.
3. To identify the paradigm shifts in retailing business with increasing scope of technology and e-business.

601: Business Planning and Project Management

To acquaint the students with the planning process in business and familiarize them with the function and techniques of project management

602: Event Management

To acquaint the students with concepts, issues and various aspects of event management

603: Management Control System

To introduce to the students the function of management control, its nature, functional areas, and techniques.

604: E- Commerce

1. To know the concept of electronic commerce
2. To know the concept of Cyber Law & Cyber Jurisprudence
3. To know Internet marketing techniques

605: Financial Services

1. To study in detail various financial services in India
2. To make the students well acquainted regarding financial markets

606: Advertising and Sales Promotion

1. To develop knowledge and understanding of importance and functions of advertising
2. To understand Key features of Sales Promotion

Name of Faculty - Science and Technology**UG Programme – B.Sc.****Subject – Chemistry****Semester-V****Course: 1) DSEC-I: CH-501: Physical Chemistry- I [Credit -2, 36 L]****Chapter 1. Quantum Chemistry**

The learner will be acquired with sound knowledge of –

1. Know historical of development of quantum mechanics in chemistry.
2. Understand and explain the differences between classical and quantum mechanics.
3. Understand the idea of wave function
4. Understanding of De Broglie hypothesis and the uncertainty principle
5. Understanding the operators: Position, momentum and energy
6. Solving Schrodinger equation for 1D, 2D and 3D model
7. Physical interpretation of the ψ and ψ^2 and sketching the wave function
8. Applications to conjugated systems, zero-point energy and quantum tunnelling, Numerical Problems.

Chapter 2. Investigation of Molecular structure

After studying this chapter, the student will be able to:

1. Understand the term additive and constitutive properties.
2. Understand the term specific volume, molar volume and molar refraction.
3. Understand the meaning of electrical polarization of molecule, induced and orientation polarization.
4. Dipole moment and its experimental determination by temperature variation method.
5. Electromagnetic spectrum, Nature of wave and its characteristics such as wavelength, wave number, frequency and velocity, Energy level diagram.
6. Classification of molecules on the basis of moment of Inertia.
7. Rotational spectra of rigid diatomic molecules, selection rules, nature of spectral lines.
8. Simple Harmonic oscillator model, Born-Oppenheimer approximation. Vibration spectra of diatomic molecules selection rules, nature of spectral lines.
9. Explain the difference between Rayleigh, Stokes and anti-Stokes lines in a Raman spectrum.
10. Justify the difference in intensity between Stokes and anti-Stokes lines.
11. Draw the Stokes and anti-Stokes lines in a Raman spectrum
12. Raman spectra: Concept of polarizability.
13. Pure rotational Raman spectra of diatomic molecules, Energy Expression, Selection rule, Rotational energy level diagram, Rotational Raman spectrum and Problems.

Chapter 3. Photochemistry

After studying this chapter, the student will be able to know and understand:

1. Difference between thermal and photochemical processes.
2. Photochemical laws: Grothus - Draper law, Stark-Einstein law.
3. Quantum yield and reasons for high and low quantum yield.
4. Factors affecting the quantum yield.
5. Experimental method for the determination of quantum yield
6. Photochemical reactions: photosynthesis, photolysis, photocatalysis, photosensitization.
7. Various photochemical phenomena like fluorescence and phosphorescence, Chemiluminescence.
8. Problems.

Course: 2) DSEC-I: CH-502: Analytical Chemistry- I [Credit -2, 36 L]

After completion of the course student should be able to

1. Define basic terms in gravimetry, spectrophotometry, qualitative analysis and parameters in instrumental analysis. Such as: Gravimetry, precipitation, solubility product, ionic product, common ion effect, precipitating agent, washing of ppt., drying and ignition of ppt., linearity range, detection limit, precision, accuracy, Sensitivity, Selectivity, Robustness and Ruggedness, electromagnetic radiations, spectrophotometry, Beers law, absorbance, transmittance, molar absorptivity, monochromator, wavelength of maximum absorbance, metal ligand ration, qualitative analysis, group reagent, dry tests, wet test, confirmatory test, precipitation, thermogravimetry, thermogram, percent wt. loss, differential thermal analysis, etc.
2. Identify important parameters in analytical processes or estimations. Example: minimum analyte concentration in particular method, reagent concentration in particular analysis (gravimetry, spectrophotometry, thermogravimetry), reagent for particular analysis, reaction condition to convert analyte into measurable form, drying and ignition temperature for ppt in gravimetry, heating rate thermogravimetry, wavelength in spectrophotometry, group reagent, removal borate and phosphate in qualitative analysis, etc.
3. Explain different principles involved in the gravimetry, spectrophotometry, parameters in instrumental analysis, qualitative analysis.
4. Perform quantitative calculations depending upon equations student has studied in the theory. Furthermore, student should able to solve problems on the basis of theory.
5. Discuss / Describe procedure for different types analyses included in the syllabus.
6. Select particular method of analysis if analyte sample is given to him.
7. Differentiate / distinguish / Compare among the different analytical terms, process and analytical methods.
8. Demonstrate theoretical principles with help of practical.
9. Design analytical procedure for given sample. 10. Apply whatever theoretical principles he has studied in theory during practical session in laboratory.

Course:3) DSEC-II: CH-504: Inorganic Chemistry - I [Credit -2, 36 L]

Chapter1.Molecular Orbital Theory of Coordination Compounds

After completion of the course student should be able to

1. Explain electroneutrality principle and different types of pi bonding. Able to explain Nephelauxetic effect towards covalent bonding.
2. Explain MOT of Octahedral complexes with sigma bonding.
3. Able to explain Charge Transfer Spectra.
4. Able to compare the different approaches to bonding in Coordination compounds.

Chapter 2. Inorganic Reaction Mechanism

After completion of the course student should be able to

1. To understand about inert and labile complexes and stability of complexes in aqueous solutions
2. Classification of reactions of coordination compounds.
3. The basic mechanisms of ligand substitution reactions.
4. Substitution reactions of square planer complexes.
5. Tran's effect and applications of Trans effect.
6. Stereochemistry of mechanism.
7. Gain the knowledge of inorganic reaction mechanisms available in the literature to solve chemical problems.

Chapter 3. Chemistry of Transition elements

After completion of the course student should be able to

1. To know position of d-block elements in periodic table.
2. To know the general electronic configuration & electronic configuration of elements.

3. To know trends in periodic properties of these elements w.r.t. size of atom and ions, reactivity, catalytic activity, oxidation state, complex formation ability, color, magnetic properties, non-stoichiometry, density, melting point, boiling point.

Chapter 4. Chemistry of f-block elements

After completion of the course student should be able to

1. The meaning of term f-block elements, Inner transition elements, lanthanides, actinides.
2. Electronic configuration of lanthanides and actinides.
3. Oxidation states of lanthanides and actinides and common oxidation states.
4. Separation lanthanides by modern methods.
5. Lanthanide contraction and effects of lanthanide contraction on post-lanthanides.
6. Use of lanthanide elements in different industries.
7. Transuranic elements.
8. Preparation methods of transuranic elements.
9. Nuclear fuels and their applications.
10. Why transuranic elements are called as the synthetic elements?
11. IUPAC nomenclature for super heavy elements with atomic no. 100 onwards.

Chapter 5. Metals, Semiconductors and Superconductors

After completion of the course student should be able to

1. The meaning of metal & semiconductor.
2. The difference between metal, semiconductor and insulator.
3. Metallic bond on the basis of band theory.
4. The energy band and energy curve.
5. Draw $n(E)$ & $N(E)$ curves.
6. Explain the electrical conductivity of metals with respect to valence electrons.
7. Explain the effect of temperature and impurity on conductivity of metals and semiconductors.
8. Intrinsic and extrinsic semiconductor.
9. The term valence band and conduction band.
10. n and p type of semiconductors.
11. Non-stoichiometry and semi conductivity.
12. Insulators on the basis of band theory.
13. The difference between Na, Mg, and Al in terms of valence electrons and conductivity.
14. Meaning of super conductors and their structure. o. Discovery and applications of superconductors.

Course: 4) DSEC-II: CH-505: Industrial Chemistry - I [Credit -2, 36 L]

Chapter 1. Modern Approach to Chemical Industry

After completion of the course student should be able to

1. Importance of chemical industry.
2. Meaning of the terms involved.
3. Comparison between batch and continuous process.
4. Knowledge of various industrial aspects.

Chapter 2. Manufacture of Basic Chemicals

After completion of the course student should be able to know

1. Concept of basic chemicals.
2. Their uses and manufacturing process.
3. They should also know the physico-chemical principals involved in manufacturing process.

Chapter 3. Sugar and Fermentation Industry

The students are expected to learn

1. Importance of sugar industry.
2. Manufacture of direct consumption (plantation white) sugar with flow diagram.
3. Cane juice extraction by various methods.
4. Clarification by processes like carbonation.
5. Sulphitation.
6. Phosphatation, etc. v. Concentration of juice by using multiple effects evaporator system.
7. Crystallization of sucrose by using vacuum pan.

Chapter 4. Soap and detergents

The students are expected to learn

1. Different types of soap products.
2. Chemistry of soap.
3. Raw materials required for soap manufacture.
4. Meaning of the term's Surfactants, Types of surfactants.
5. Raw materials for detergents.
6. Detergent builders, additives.
7. Washing action of soap and detergents.

Chapter 5. Dyes and Pigments

Students should know about

1. Dyes: introduction.
2. Dye intermediates.
3. Structural features of a dye.
4. Classification of dyes.
5. Synthesis, Structures, properties and applications of dyes
6. Pigments: Introduction.
7. Classification and general properties of pigment.
8. Production processes of zinc oxide and iron oxide.

Course: 5) DSEC-III: CH-507: Organic Chemistry - I [Credit -2, 36 L]

Chapter 1. Polynuclear and Heteronuclear Aromatic Compounds

Students should know about

1. Define and classify polynuclear and heteronuclear aromatic hydrocarbons.
2. Write the structure, synthesis of polynuclear and heteronuclear aromatic hydrocarbons.
3. Understand the reactions and mechanisms.
4. Explain the reactivity of polynuclear and heteronuclear aromatic hydrocarbons.
5. Describe the synthesis of chemical reactions of polynuclear and heteronuclear aromatic Hydrocarbons.

Chapter 2. Active Methylene Compounds

Students should be able to understand

1. Meaning of active methylene group.
2. Reactivity of methylene group.
3. Synthetic applications ethyl acetoacetate and malonic ester
4. To predict product with panning or supply the reagent/s for these reactions

Chapter 3. Rearrangement Reactions

Students should be able to understand

1. What is rearrangement reaction?

2. Different types of intermediate in rearrangement reactions?
3. To write the mechanism of some named rearrangement reactions and their applications.
4. Electrocyclic rearrangement with their mechanisms.

Chapter 4. Elimination reactions

Students should be familiar with

1. 1,1 and 1,2 elimination.
2. E1, E2 and E1cB mechanism with evidences of these reactions.
3. Understand stereochemistry by using models and learn reactivity of geometrical isomers.
4. Orientation and reactivity in E1 and E2 elimination.
5. Hoffmann and Saytzeff's Orientation.
6. Effect of factors on the rate elimination reactions.

Course: 6) DSEC-III: CH-508: Chemistry of Biomolecules [Credit -2, 36 L]

Chapter 1. Introduction to molecular logic of life.

Students should be familiar with

1. Cell types, Difference between a bacterial cell, Plant cell and animal cell. Biological composition and organization of cell membrane, structure and function of various cell organelles of plant and animal cell. Concepts of biomolecules, Bonds that link monomeric units to form macromolecules

Chapter 2. Carbohydrates

1. The student will understand the types of carbohydrates and their biochemical significance in living organisms, structure of carbohydrates and reactions of carbohydrates with Glucose as example. Properties of carbohydrates.

Chapter 3. Lipids

1. The student needs to know the types of lipids with examples, structure of lipids, properties of lipids .

Chapter 4. Amino acids and proteins

1. The student will understand the structure and types of amino acids. Reactions of amino acids. Properties of amino acids. Peptide bond formation. Types of proteins. Structural features in proteins. Effect of pH on structure of amino acid, Determination of N and C terminus of peptide chain.

Chapter 5. Enzymes

1. The student know the classes of enzymes with subclasses and examples. Enzyme specificity, Equations of enzyme kinetics K_m and its significance, features of various types of enzyme inhibitions, industrial applications of enzymes.

Chapter 6. Hormones

Students should be familiar with

1. Basic concepts of Endocrinology. Types of Endocrine glands and their hormones. Biochemical nature of hormones. Mechanism of action of lipophilic and hydrophilic hormones.

SEC-I: CH-510: Skills Enhancing Course-I [Credit -2, 36 L]

Course7) CH-510 (B) : Polymer Chemistry

The students are expected to learn the following aspects of Polymer Chemistry:

- 1) History of polymers.
- 2) Difference between simple compounds and polymer.
- 3) Names of polymers.
- 4) Various ways of nomenclature.
- 5) Difference between natural, synthetic, organic and inorganic polymers.
- 6) Terms-Monomer, Polymer, Polymerization, Degree of polymerization, Functionality, Number average, Weight average molecular weight.
- 7) Mechanisms of polymerization.
- 8) Polymerization techniques.
- 9) Uses & properties of polymers.
- 10) Role of polymer industry in the economy.
- 11) Advantages of polymers.

SEC-II: CH-511: Skills Enhancing Course-II [Credit -2, 36 L]

Course8) CH-511 (A): Environmental Chemistry

Students should know:

1. Importance and conservation of environment.
2. Importance of biogeochemical cycle
3. Water resources
4. Hydrological Cycle
4. Organic and inorganic pollutants
5. Water quality parameters

Theory Courses:

Course1: DSEC-IV: CH-601: Physical Chemistry-II [Credit -2, 36 L]

Chapter1. Electrochemical Cells

After studying this chapter, the student will be able to know and understand:

1. Electrochemical cells: Explanation of Daniell cell, Conventions to represent electrochemical cells 2. Thermodynamic conditions of reversible cell, Explanations of reversible and irreversible electrochemical cell with suitable example,
3. EMF of electrochemical cell and its measurement.
4. The Weston standard cell
5. The primary reference electrode: The standard hydrogen electrode (SHE) with reference to diagram, Construction, representation, working and limitation,
6. Secondary reference electrodes: (a) The calomel electrode, (b) The glass electrode (c) The silver-silver chloride electrode. Understanding of these electrodes with reference to diagram, representation, Construction, working
7. Nernst Equation for theoretical determination of EMF
8. Types of Reversible electrodes: Metal-metal ion electrodes, Amalgam electrodes, Gas electrodes, Metal-metal insoluble salt electrodes, Oxidation-reduction electrodes with respect to examples, diagram, representation, construction, working (electrode reactions) and electrode potential.
9. Sign convention for electrode potentials and Electrochemical series
10. Standard electrode potentials,
11. Types of concentration cells: Concentration cells without and with transference Concentration cells with liquid junction potential
12. Liquid junction potential and salt bridge
13. Applications of emf measurements: 1. Determination of pH of a solution by using hydrogen electrode, quinhydrone electrode and glass electrodes 2. Potentiometric titrations: i) Acid-base titrations, (ii) Redox titrations and (iii) Precipitation
14. Primary Batteries: Dry Cells, alkaline batteries with respect to construction, diagram and working
15. Secondary Batteries: Nickel-cadmium, Lithium-ion batteries, the lead acid battery with respect to construction, diagram and working
16. Applications for Secondary Batteries
17. Fuel Cells: Types of fuel cells, advantages, disadvantages of these fuels cells, comparison of battery Vs fuel cell
18. Problems.

Chapter2. Crystal structure

After studying this topic students are expected to know and understand:

1. Distinguish between crystalline and amorphous solids / anisotropic and isotropic solids.
2. Explain the term crystallography and laws of crystallography.
3. Weiss and Millers Indices, determination of Miller Indices
4. Bravais lattices, space groups, seven crystal systems and fourteen Bravais lattices;
5. Cubic lattice and types of cubic lattice
6. Distance between the planes for 100, 110 and 111 for cubic lattice
7. Methods of Crystal structure analysis: The Laue method and Bragg's method: Derivation of Bragg's equation,
8. Determination of crystal structure of NaCl by Bragg's method,
9. X ray analysis of NaCl crystal system and Calculation of d and λ for a crystal system,
10. Problems.

Chapter3. Nuclear Chemistry

After studying this topic students are expected to know

1. Radioactivity
2. Types and properties of radiations: alpha, beta and gamma
3. Detection and Measurement of Radioactivity: Cloud chamber, Ionization Chamber, Geiger-Muller Counter, Scintillation Counter, Film Badges
4. Types of radioactive decay: α -Decay, β -Decay and γ -Decay
5. The Group Displacement Law, Radioactive Disintegration Series
6. Kinetics of Radioactive Decay, Half-life, average life and units of radioactivity
7. Energy released in nuclear reaction: Einstein's equation, Mass Defect, Nuclear Binding Energy,
8. Application of radioisotopes as a tracer: Chemical investigation- Esterification, Friedel - Craft reaction and structure determination w.r.t PCl_5 , Age determination use of tritium and C^{14} dating.
9. Solve the problems based on this topic

Course 2: DSEC-IV: CH-602: Physical Chemistry-III [Credit -2, 36 L]

Chapter 1. Colligative properties of dilute solutions

After studying this topic students are expected to know

1. Meaning of the terms-Solution, electrolytes, nonelectrolytes and colligative properties,
2. Lowering of vapour pressure of solvent in solution,
3. Elevation of B.P. of solvent in solution, Landsberger's method,
4. freezing point depression, Beckmann's method Osmosis and Osmotic pressure, Berkeley and Hartley method,
5. Application of colligative properties to determine molecular weight of nonelectrolyte, abnormal molecular weight,
6. Relation between Vant Hoff's factor and degree of dissociation of electrolyte by colligative property,
7. Problems.

2) Kinetics of Reactions in the Solid State

After studying this topic students are expected to know

1. Factors affecting on solid state reactions,
2. Rate laws for reactions in solid state
3. Applying rate laws for solid state reactions
4. Results of kinetics studies

3) Electronic structure and macroscopic properties

After studying this topic students are expected to know

1. Cohesive Energy of ionic crystals based on coulomb's law and Born Haber Cycle
2. Correspondence between energy levels in the atom and energy bands in solid
3. Band structure in solids – Na , Ca and diamond
4. Conductors and insulators – Its correlation with Extent of energy in energy bands
5. phenomena of photoconductivity
6. Semiconductors – Role of impurity in transformation of insulator into semiconductor
7. Temperature dependant conductivity semiconductors
8. Cohesive Energy in metals
9. Numericals based on cohesive energy.

4) Polymers

After studying this topic students are expected to know

- 1) History of polymers.
- 2) Classification of polymers
- 3) Chemical bonding & Molecular forces in Polymer
- 4) Molecular weight of polymers
- 5) Practical significance of polymer molecular weights

6) Molecular weight determination.

Course3: DSEC-V: CH-604: Inorganic Chemistry -II [Credit -2, 36 L]

1. Organometallic Chemistry

Students should be able:

- 1.To understand M-C bond and to define organometallic compounds
- 2.To define organometallic chemistry
3. To understand the multiple bonding due to CO ligand.
- 4.To know methods of synthesis of binary metal carbonyls.
5. To understand the structure and bonding using valence electron count (18 ele. rule)
- 6.To understand the catalytic properties of binary metal carbonyls.
7. To understand the uses of organometallic compounds in the homogenous catalysis.
8. Chemistry of ferrocene.

2. Homogeneous and Heterogeneous catalysis

A student should be able to:

- 1.Understand the phenomenon of catalysis, its basic principles and terminologies.
2. Define and differentiate homogeneous and heterogeneous catalysis.
- 3.Give examples and brief account of homogeneous catalysts.
4. Understand the essential properties of homogeneous catalysts-Give the catalytic reactions for Wilkinson's Catalysis, hydroformylation reaction, Monsanto acetic acid synthesis, Heck reaction
- 5.Understand the principle of heterogeneous catalyst and development in it.
- 6.Give examples of heterogeneous catalysts.
7. Understand the classification and essential properties of heterogeneous catalysts.
8. Give the brief account of Hydrogenation of olefins , Zeolites in catalysis, biodiesel synthesis, Automotive Exhaust catalysts
9. Understand the catalytic reactions used in industries around.

3. Bioinorganic Chemistry

A student should:

1. Identify the biological role of inorganic ions & compounds.
2. Know the abundance of elements in living system and earth crust.
3. Give the classification of metals as enzymatic and non-enzymatic.
4. Understand the role of metals in non-enzymatic processes.
5. Know the metalloproteins of iron.
6. Explain the functions of hemoglobin and myoglobin in O₂ transport and storage.
7. Understand the toxicity of CN⁻ and CO binding to Hb.
8. Draw the structure of Vit.B12 and give its metabolism.

4. Inorganic Polymers

A student should be able to:

1. know thy types of Inorganic polymers
2. comparison with organic polymers
3. synthesis, structural aspects of Inorganic polymers
4. understand the polymers of Si, B, Si and P
5. Inorganic polymers and their use.

5. Inorganic solids/ionic liquids of technological importance

A student should know:

1. Understand Preparation of inorganic solids by various methods,
2. Inorganic liquid crystals
3. Ionic liquids, their preparations, and their significance w.r.t green chemistry.
4. Technological importance of ionic liquids.

Course:4 DSEC-V: CH-605: Inorganic Chemistry -III [Credit -2, 36 L]

1. Acid–Base and Donor–Acceptor Chemistry

A student should know:

1. The concept of acid base and their theories.
2. They will also come to know different properties of acids and bases.
3. Strength of various types acids. 4. How acid and base strengths get affected in non-aqueous solvents.

2. Ionic Solids

A student should know:

1. The nature of solids.
2. The crystal structures of solids.
3. Draw the simple cubic, BCC and FCC structures.
4. Identify the C.N. of an ion in ionic solid.
5. Identify the type of void.
6. Know the effect of radius ratio in determining the crystal structure.
7. Be able to define Pauling's univalent radius and crystal radius.
8. Be able to solve simple problems based on Pauling's univalent radii and crystal radii. 9. Know how to draw Born-Haber cycle.
10. Be able to solve simple problems based on Born- Haber cycle.
11. Know the defects in Ionic solids.
12. Be able to differentiate between the defects.

3. Chemistry of Zeolites

A student should know:

1. Different Zeolite Framework Types and their classification
2. Zeolite synthesis and their structure
3. Application of zeolites.

4. Introduction to Nanochemistry

A student should know:

1. Various methods of nanoparticle synthesis
2. Stabilization of Nanoparticles in solution
3. Properties and Application of Nanoparticles
4. Know about carbon nanotube and its application

5. Chemical Toxicology

A student should be able –

1. To know toxic chemical in the environment.
2. To know the impact of toxic chemicals on enzyme.
3. To know the biochemical effect of Arsenic, Cd, Pb, Hg.
4. To explain biological methylation.

Course 5: DSEC-VI: CH-607: Organic Chemistry-II [Credit -2, 36 L]

A student should know:

1. The principle of mass spectroscopy, its instrumentation and nature of mass spectrum.

2. Students will understand the principle of UV spectroscopy and the nature of UV spectrum. They will learn types of electronic excitations.
3. Students will be able to calculate maximum wavelength for any conjugated system. \ And from the value of λ -max they will be able to find out the extent of conjugation in the compound.
4. Students will understand the principle of IR spectroscopy, types of vibrations and the nature of IR spectrum.
5. From the IR spectrum, they will be able to find out IR frequencies of different functional groups. And thus, they will be able to find functional groups present in the compound.
6. Students will understand the principle of NMR spectroscopy and will understand various terms used in NMR spectroscopy. They will learn measurement of chemical shift and coupling constants.
7. Students will be able to interpret the NMR data and they will be able to use it for determination of structure of organic compounds.
8. Students will be able to determine the structure of simple organic compounds on the basis of spectral data such as λ max values, IR frequencies, chemical shift (δ values).

Course 6: DSEC-VI: CH-608: Organic Chemistry-III [Credit -2, 36 L]

A student should know:

1. Different terms used – Disconnection, Synthons, Synthetic equivalence, FGI, TM. One group disconnection, Retrosynthesis and Synthesis of target molecules: Acetophenone, Crotonaldehyde, Cyclohexene, Benzylbenzoate, and Benzyl diethyl malonate.
2. Chemistry of reactive intermediates (carbocations, carbanions, free radicals, carbenes, nitrenes, benzyne etc...); 2. Wolff rearrangement (Step up),
3. Hofmann rearrangement (Step down), Simmons-Smith reaction, Michael reaction Wittig reaction and McMurry reaction, Diels-Alder reaction, Functional group interconversions and structural problems using chemical reactions.
4. Isolation, Classification. Citral- structure determination using chemical and spectral methods, Synthesis of Citral by Barbier and Bouveault Synthesis. Alkaloids:

Introduction, extraction, Purification, Some examples of alkaloids and their natural resources. Ephedrine- structure determination using chemical methods. Synthesis of Ephedrine by Nagai.

SEC-III: CH-610: Skill Enhancing Course-III [Credit -2, 36 L]

Course 7: CH-610 (A): Chemistry of Soil and Agrochemicals

After studying this course, student is expected to

1. Understood various components of soil and soil properties and their impact on plant growth.
2. Understood the classification of the soil.
3. Explores the problems and potentials of soil and decide the most appropriate treatment for land use.
4. Understood the Reclamation and management of soil physical and chemical constraints.
5. Useful in making decisions on nutrient dose, choice of fertilizers and method of application etc. practiced in crop production.
6. Got experience on advanced analytical and instrumentation methods in the estimation of soil.
7. Understood various Nutrient management concepts and Nutrient use efficiencies of major and micronutrients and enhancement techniques.
8. Proper understanding of chemistry of pesticides will be inculcated among the students.
9. Imparts knowledge on different pesticides, their nature and, mode of action and their fate in soil so as to monitor their effect on the environment.

SEC-IV: CH-610: Skill Enhancing Course-IV [Credit -2, 36 L]

Course 8: CH-611(A): Analytical Chemistry-II

After completion of the course student should be able to

1. Define basic terms in solvent extraction, basics of chromatography, HPLC, GC, and

AAS and AES. Some important terms are: solvent extraction, aqueous and organic phase, distribution ratio and coefficient, solute remain unextracted, percent extraction, ion association complex, theoretical plate, HETP, retention time, selectivity, resolution, stationary phase, normal and reverse phase, ion exchange, column efficiency, carrier gas, split and splitless injection, packed column, tubular column, atomic absorption and emission spectroscopy, electronic excitation in atoms, nebulization, atomization, reduction of metal ions in flame, absorbance by atoms in flame, flame atomizers, furnace atomizers, interference in AES and FES, HCL, hydride generator, etc.

2. Identify important parameters in analytical processes or estimations. Example: minimum analyte concentration in particular method, reagent concentration for particular analysis, reagent for particular analysis, reaction condition to convert analyte into measurable form, wavelength selection in HPLC with spectrophotometric and fluorometric detector, solvent or carrier gas in HPLC and GC, choice method for the sample preparation in atomic spectroscopic methods, choice of filter and HCL in atomic spectroscopic methods, etc.

3. Explain different principles involved in the analyses using solvent extraction, basics of instrumental chromatography, HPLC, GC, and atomic spectroscopic techniques.

4. Perform quantitative calculations depending upon equations students has studied in the theory. Furthermore, student should able to solve problems on the basis of theory.

5. Discuss / Describe procedure for different types analyses included in the syllabus.

6. Select particular method of analysis if analyte sample is given to him.

7. Differentiate / distinguish / compare among the different analytical terms, process and analytical methods.

8. Demonstrate / explain theoretical principles with help of practical.

9. Design analytical procedure for given sample.

10. Apply whatever theoretical principles he has studied in theory during practical in laboratory.

Subject - Mathematics

F.Y.B.Sc. :-

Algebra –

Studying algebra helps our mind to think logically and break down and solve problems. Use algebraic methods to solve a variety of problems involving system of equations, inequalities, exponential, logarithmic, inverse, polynomial and rational functions.

Calculus –

Calculus is the foundation for most of the mathematics studied at the university level. Main concepts of calculus are derivatives (rate of change of a function) and integrals.

(a function of which a given function is the derivative i.e. which gives that function when differentiated)

Analytical Geometry –

The importance of analytical geometry is that it establishes a correspondence between geometric curves and algebraic equations. This is a subject of mathematics in which algebraic symbolism and methods are used to represent and solve problems in geometry.

S.Y.B.Sc :-

Calculus of Several variables –

This course is aimed of students majoring in mathematical and physical sciences, engineering and students minoring in mathematics or mathematical education. Calculus of Several variables extends the concepts of limit, Continuity, derivatives , integrals from one dimension to higher dimensional settings.

Numerical Methods and its applications –

It is widely used for forecasting and predicting in the field of machine learning. Most mathematical methods are based on the solutions obtained by partial differential equations, ordinary differential equations and integral equations. Numerical methods provide a way to solve problems quickly and easily compared to analytic solutions.

Linear Algebra –

Linear algebra helps us to understand geometric concepts such as planes in higher dimensions and perform mathematical operations on them. This is an extension of algebra into an arbitrary number of dimensions. Rather than working with scalars , it works with matrices and vectors.

Vector Calculus -

Vector Calculus plays an important role in differential geometry and the study of partial differential equations. It is used extensively in physics, engineering . Vectors have many real life applications, including situations involving force or velocity.

Subject – Zoology

Semester-III & Semester-IV

ZO - 231 Animal Diversity III and ZO - 241 Animal Diversity IV

1. The students will be able to understand, classify and identify the diversity of higher vertebrates.

2. The students will be able to understand the complexity of higher vertebrates
3. The students will be able to understand different life functions of higher vertebrates.
4. The students will be able to understand the linkage among different groups of higher vertebrates.
5. The student will become aware regarding his role and responsibility towards nature as a protector, to understand his role as a trustee and conservator of life which he has achieved by learning, observing and understanding life

ZO - 232 Applied Zoology I & ZO - 242 Applied Zoology II

1. The learner understands the basics about beekeeping tools, equipment, and managing beehives.
2. The learner understands the basic information about fishery, cultural and harvesting methods of fishes and fish preservation techniques.
3. The learner understands the biology, varieties of silkworms and the basic techniques of silk production.
4. The learner understands the types of agricultural pests, Major insect pests of agricultural importance and Pest control practices.

ZO - 233 Zoology Practical Paper and ZO - 243 Zoology Practical Paper

1. The learner understands the basics about beekeeping tools, equipment, and managing beehives
2. The student will become aware regarding his role and responsibility towards nature as a protector, to understand his role as a trustee and conservator of life which he has achieved by learning, observing and understanding life

Subject – Botany

COURSE OUTCOME [C.O]: F.Y.B.Sc. Semester Pattern:-

[SEMESTER-I]

BO-111 PLANT LIFE AND UTILIZATION –I

- Understand the diversity among Algae, Lichens, Fungi, and Bryophytes
- General Outline of plant kingdom
- Lower Cryptogam, Algae, Fungi, & Lichene.
- Higher Cryptogam, Bryophyte and Pteridophyte.
- Distinguishing character of these group

BO-112 PLANT MORPHOLOGY AND ANATOMY

- Understand the habit of the angiosperm plant body.
- Know the vegetative characteristics of the plant.
- Learn about the reproductive characteristics of the plant.
- Understand the scope & importance of Anatomy
- Know various tissue systems
- Perform the techniques in anatomy
- Understand the normal and anomalous secondary growth in plants and their causes

BOT. 113: PRACTICAL COURSE BASED ON BO111 & BO 112

- Study of diversity of Bryophytes and Pteridophytes w.r.t systematic position and morphology.
- Study of life cycle of *Riccia*, *Spirogyra*, *Agaricus*.
- Morphology of root and stem with its modification.
- Morphology of Leaf and its modification.
- Study of Flower morphology , Inflorescence and its types of Inflorescence.
- Study fruit Morphology and types.
- Study of internal primary structure of Dicot & Monocot.

[SEMESTER-II]

BO-121 PLANT LIFE AND UTILIZATION –II

- Understand the morphological diversity of Pteridophytes, Gymnosperm, and Angiosperm.
- Understand the economic importance.
- Know the vegetative characteristics of the plant
- Learn about the reproductive characteristics of the plant.
- Understand Gymnosperms, distinguishing characters, economic importance and classification.

BO-122 PRINCIPLE OF PLANT SCIENCE [Physiology & Cell Biology]

- Know importance and scope of plant physiology.
- To understand the plants and plant cells in relation to water.
- Understand the process of Diffusion, Osmosis, Plasmolysis, Plant growth& growth regulators.
- Understand the Structure, types of plant cell, cellwall, plasma membrane& cell cycle in plants.
- Understand the Molecular biology ,Structure& types of DNA, DNA replication.

BOT. 123: PRACTICAL COURSE BASED ON BO121 & BO 122

- Study of Life Cycle of *Nephrolepis*, *Cycas*
- Study of utilization and economic importance of Pteridophytes and Gymnosperms.

- Study of comparative account of Dicotyledonous and Monocotyledonous plants
- Study of utilization and economic importance of Angiosperms- food, fodder, fibers, horticulture and Medicines.
- Study of mitosis, Meiosis.
- Estimation of chlorophyll-a and chlorophyll-b
- Plasmolysis- endosmosis, exosmosis Demonstration of Osmosis

COURSE OUTCOME [C.O]: S.Y.B.Sc. Semester Pattern:-

[SEMESTER-III]

BO-211 TAXONOMY OF ANGIOSPERMS & PLANT COMMUNITY

- Understand the diversity of angiosperms.
- Understand the comparative account among the families of angiosperms.
- Know the economic importance of the angiosperm plants.
- Understand the distinguishing features of. Angiosperm families
- Understand the Ecology and ecological grouping of plant.

BO- 212: PLANT PHYSIOLOGY

- Know importance and scope of plant physiology.
- To understand the plants and plant cells in relation to water.
- Understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C3 and C4 pathways.
- Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration.
- Learn about the movement of sap and absorption of water in plant body.

-Understand the plant movements.

[SEMESTER-IV]

BO- 221: ANATOMY AND EMBRYOLOGY

-Understand the scope & importance of Anatomy and Embryology.

-Know various tissue systems.

-Understand the normal and anomalous secondary growth in plants and their causes.

- Perform the techniques in anatomy.

-Understand structure and development in microsporangium and mega sporangium.

-Understand Microsporogenesis and megasporogenesis.

-Understand male and female gametophytes.

-Know fertilization, endosperm and embryogeny

BO- 222: PLANT BIOTECHNOLOGY

- Understand the Biotechnology, Interdisciplinary nature of biotechnology, Nano-biotechnology

- Understand the Enzyme Technology, Fermentation Technology.

- Understand the Single cell protein, Environmental Biotechnology.

-Study of plant genetic engineering, Methods of gene transfer in plants.

- Application of plant genetic engineering in crop improvement.

PRACTICAL COURSE BASED ON BO211, BO212& BO221,BO222

Students should understand,

-Determine the DPD by using the potato tuber

-To determine the rate of photosynthesis

-Determination of RQ using Ganong's respirometer

-Osmosis by curling experiment, Imbibition

Pressure, Thistle funnel, ringing experiment,

Relative transpiration, CO₂ Necessary for

Photosynthesis, Kuhlen's Tube experiment,

Cyclosis in Hydrilla

-Study of Plant families w.r.t Systematic position, Morphological characters, floral formula
And floral diagram.

-Preparation of artificial key.

COURSE OUTCOME [C.O]: T.Y.B.Sc. Semester Pattern:-

[SEMESTER-V]

BOT. 351 ALGAE & FUNGI

- Understand Cryptogams & Lower Cryptogams

-General Algae: General characters, distribution, Thallus organization, habit and Habitat

reproduction and Classification

-life cycle of algae with reference to taxonomic position

-Economic importance of algae- Role in industry, agriculture, fodder and medicine.

-Understand Fungi: General characters, Habit and habitats, thallus organization, cell wall

composition, nutrition and Classification

-Understand life cycle of fungi

-Understand Symbiotic Associations - Lichens, Mycorrhiza and their significance

BOT. 352 ARCHEGONIATE

-Gain knowledge about "Archegoniate".

-Understand Introduction, general characters, distribution of Bryophytes to land habit, classification of Bryophytes

- Learn the Life Cycle of Bryophytes with respect to Taxonomic position .

-Understand Ecological and economic importance of Bryophyte .

-Understand the Introduction, Vascular Cryptogams, General characteristics, Classification

-Understand Life Cycle of Pteridophytes with respect to Taxonomic position

BOT. 353 – SPERMATOPYTA & PALEOBOTANY

-Understand the Origin of angiosperms

Pseudanthial , TransitionalCombinational

- Speciation &
Endemism,

-To understand Classification:

-To study the Herbaria and Botanical Gardens

BOT. 354 – PLANT ECOLOGY

-Understand Introduction, general characters, economic importance and classification according to Chamberlain .

- Fossil- Definition, process of fossil formation, types of fossils.-Impression,
Compression, Petrification, Pith cast and Coal ball

- Understand the Introduction, interrelationship between the living world and the environment,
levels of organization, components and dynamism of ecosystem, homeostasis, niche concept,
concept of limiting factors

-Realize the Biogeography: Floristic realms, speciation and its types, biogeographic regions of India,Plant indicators

-Learn about Population ecology:Definition, characteristics, population growth form, r and k selection .

-To understand Community ecology: Introduction and Definition, community structure, physiognomy, Raunkiaer's life form classification, keystone species, edge and ecotone.

-To understand Biogeochemical cycles: The carbon cycle, Nitrogen cycle, Phosphorus cycle, and Hydrologic cycle

-To understand Ecological Impact Assessment

-To understand Environmental Audit

Meaning and concept, need, objectives, benefits, types, audit protocol, process, certification, personnel environmental audit .

-To understand Remote Sensing

Definition, basic principles, process of ecological data acquisition and interpretation, global positioning system,application of remote sensing in ecology.

-To understand Ecological management: Concepts, sustainable development, sustainability indicators

BOT. 355 – CELL AND MOLECULAR BIOLOGY

-To understand scope of Introduction to Cell Biology : Definition, Brief history of Cell Biology, Units of measurement for cell, Interdisciplinary nature of Cell Biology

- To Cell organelles: Ultrastructure, components and functions of Cell wall and cell membranes, mitochondria and Chloroplast, endoplasmic Reticulum, Golgi apparatus, Lysosomes, Vacuoles, Peroxisomes & Glyoxysomes .

-To understand Nucleus: Morphology and ultrastructure of nucleus .

-To study Chromosomes: Euchromatin and heterochromatin Histones .

- To understand Cell signaling: Introduction and definition

-To understand Genetic material DNA: historical perspective from 1953 to 2020, Griffith's and Avery's transformation experiments, Hershey-Chase bacteriophage experiment.

-To understand DNA replication Gene expression:Transcription (Prokaryotes in details and passing remarks on Eukaryotes

-To understand Translation (Prokaryotes and Eukaryotes): Definition, concept and properties of

Regulation of gene expression

BOT. 356 – GENETICS

- To understand Introduction to Genetics.

History, Definition, Concept, branches and applications of Genetics. .

- To understand Mendelism

Genetical terminology, Monohybrid cross, Law of dominance, Incomplete dominance, Law of segregation, Dihybrid cross, Dihybrid ratio .

- To understand Neo Mendelism (Gene Interaction) .

- To understand Multiple alleles .

- To understand Linkage, Recombination and Crossing Over

-To understand Mutation: Concept, definition and types

-To understand Numerical alterations of chromosomes

-To understand Cytoplasmic & Quantitative Inheritance Sex Linked Inheritance

BOT. 3510 – MEDICINAL BOTANY

-To understand Medicinal Plants: History, Scope and Importance

-To understand Indigenous Medicinal Sciences; Definition and Scope

-To understand Ayurveda: History, origin, panchamahabhutas, saptadhatu and tridosha concepts, Rasayana, plants used in ayurvedic treatments

-To understand Siddha: Origin of Siddha medicinal systems, Basis of Siddha system, plants used in Siddha medicine

-To understand Unani: History, concept: Umoor-e- tabiya, tumors treatments/ therapy, polyherbal formulations.

-To understand Conservation of endangered and endemic medicinal plants

-To understand Propagation of Medicinal Plants

-To understand Ethnobotany and Folk medicines

Folk medicines

BOT. 3511– PLANT DIVERSITY AND HUMAN HEALTH

-To understand Plant diversity and its scope- Genetic diversity, Species diversity, Plant diversity at the ecosystem level

-To understand Agrobiodiversity 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

-To understand Loss of Biodiversity

-To understand Conservation of Biodiversity

[SEMESTER-VI]

BOT. 361 – PLANT PHYSIOLOGY AND METABOLISM

-To understand Mineral nutrition Classification of mineral elements, macro and micronutrients; Role of essential elements; Transport of ions across cell membrane, Ionophores , Carriers and Channels

-To understand Photosynthesis: Mechanism of photosynthesis- Electromagnetic spectrum Ultra-Structure of Chloroplast, Organization of Light-Absorbing Antenna Systems, Light Reaction: (Cyclic and Non-cyclic photophosphorylation), Dark Reaction: Calvin–Benson Cycle, Photorespiration

-To understand Respiration: Types of respiration (Aerobic and anaerobic), Mechanism of aerobic respiration (Glycolysis, TCA cycle, Terminal oxidation and phosphorylation in respiratory chain); Pentose Phosphate Pathway

-To understand Stomatal Biology

-To understand Translocation in phloem

-To understand Plant growth regulators: Discovery and physiological roles of auxins, gibberellins, cytokinins, ABA, ethylene

-To understand Photomorphogenesis: Red and far red light responses on photomorphogenesis; Phytochrome

BOT. 362 – BIOCHEMISTRY

-Foundation of Biochemistry : From molecules to the first cell (origin of a cell), Miller and Urey experiment.

-Water: The solvent of life: Physical properties of water, structure of water molecule, polarity of water molecule, weak interactions in aqueous solutions.

-Amino acids and proteins: Structure, classification, properties and functions of amino acids. Structure (primary, secondary, tertiary and quaternary), properties and functions of proteins. Biological disorders of amino acid metabolism. Commercial applications

-Enzymes: Definition, nature of enzymes

-Carbohydrates: Definition, classification of carbohydrates

-Lipids: Definition, classification of lipids: simple, conjugate and derived lipids, properties and functions of lipids

-Vitamins: Definition, classification of vitamins. source and functions of vitamins.

BOT. 363 – PLANT PATHOLOGY

-Know the Fundamentals of Plant Pathology: Introduction, Important terminology- Incitants, Host, Symptoms, Parasite, Pathogen, Inoculum, Penetration, Infection, Incubation, Disease. .

-Understand Disease Development: Concept of disease cycle, Inoculation, Prepenetration, Penetration, Infection, Dissemination. Epidemics-Forms

Defense Mechanisms: Concept and Definition, Types-Preexisting-Structural and chemical, Induced-Structural and Biochemical.

-Know the Methods of Studying Plant Diseases. Macroscopic study, Microscopic study, Koch's postulates. Types of culture Media, Pure culture methods- Streak plate, Pour plate, Spread plate.

-Know the Fungal Plant Diseases Introduction to fungi as plant pathogens. Study of Diseases- Downy mildew of Grapes, Head smut of Jowar, Tikka diseases of Groundnut with reference to causal organism, symptoms and disease management.

Bacterial Plant Diseases. Introduction to bacteria as plant pathogens, Study of Diseases

Mycoplasma Plant Diseases: Introduction to Mycoplasma as plant pathogens, Study of Diseases- Grassy shoot disease of sugarcane

Nematodal Plant Diseases: Introduction to Nematodes as plant pathogens. Study of Diseases- Root knot diseases of vegetables

Viral Plant Diseases: Introduction of Virus as plant pathogens. Study of Diseases- Papaya Mosaic Disease, Bunchy top of Banana with reference to causal organism, symptoms and causal organism

Non-Parasitic Diseases. The impact and abiotic causes- Temperature, Soil moisture and relative humidity, Poor oxygen, Poor light, Air pollutants, mineral deficiencies. Herbicidal injury, Study of Mango necrosis, Black Heart of Potato.

Principles of plant diseases control: General account, Quarantine Eradication, cultural control practices, Biological control. Curative measures, chemical control, Use of Effective Microorganism solution (EMS), Microbial Pesticides

BOT. 364 – EVOLUTION AND POPULATION GENETICS

-Student will understand the Organic Evolution: Distinction between Origin of life and Organic Evolution, Historical account of Origin of life, Origin of Earth Vs Origin of life

-Understand the Organic Evolution: The concept of organic evolution .

-Know the Evidences of Evolution .

-Understand the Evolution Through Ages: Fossils and Geological Time scale

-Know the Population Genetics and Evolution: Concept of Mendelian population, Gene Pool and its models .

Speciation and Isolating Mechanisms: Introduction, Morphological Criteria for Species and Races, Allopatric and Sympatric Populations, Isolating Mechanisms: Pre zygotic Isolation mechanisms: Concept, Spatial & Ecological;

BOT. 365 – ADVANCED PLANT BIOTECHNOLOGY

-Understand the Introduction, Traditional and modern Biotechnology. Impact of Biotechnology on Health care, Agriculture, and Environment .

-Know the Plant Tissue Culture: Concepts of Cell theory & Cellular totipotency, Landmarks in plant tissue culture

-Understand Techniques of Genetic Engineering and Methods of gene transfer in Plants- Introduction to Molecular tools

-Cryopreservation and Germplasm Conservation Definition and concept, techniques of cryopreservation, cold storage, long term and short term storage, applications. .

-Biotechnology and Society

-Microbial Biotechnology

-Transgenic Plants as Bioreactors

-Nano-biotechnology

Definition and concept, Applications of nanotechnology in agriculture (fertilizers and pesticides).

BOT. 366 – PLANT BREEDING AND SEED TECHNOLOGY

-Understand the Introduction: Definition, Scope and objectives and History of Plant breeding in India .

-Techniques and practices of plant breeding

-Advanced techniques in Plant breeding

-Introduction to Seed Technology

-Seed legislation

-Seed Production

-Seed Certification

-Seed Testing

-Seed Pathology and Entomology

-Seed Storage

BOT. 3610 – NURSERY AND GARDENING MANAGEMENT

-Nursery Management

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

-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.

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

-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.

-Sowing/raising of seeds and seedlings - Transplanting of seedlings - Study of cultivation of different vegetables: cabbage, brinjal, lady's finger, onion, garlic, tomatoes, and carrots - Storage and marketing procedures.

BOT. 3611- BIOFERTILIZER

-Introduction:

Introduction, Scope and importance of Biofertilizers

General account of the microbes used as Biofertilizers

-Bacterial Biofertilizers

Isolation of Rhizobium, Identification, Mass multiplication, Carrier based inoculants.

-Algal Biofertilizers

-Cyanobacteria (Blue Green Algae): Isolation of Anabaena from Azolla, Mass Multiplication of Anabaena

-Fungal Biofertilizers

-Introduction, Occurrence and Distribution of Mycorrhizal association

-Types of Mycorrhizal association, growth and yield - colonization

-Compost and Manure

-Organic Farming, green manuring, organic manures and their uses

-Recycling by composting method of biodegradable, municipal

Name of Faculty – Science & Technology

U.G. Program – B.Sc. Wine, Brewing & Alcohol Technology

COURSE OUTCOMES [C.O]: F.Y.B.SC.

[SEMESTER-I]

WBAT-101 BASIC MICROBIOLOGY PAPER-I

-To understand the History, Branches and Scope of Microbiology.

-To know Importance, occurrence and types of microorganisms.

-To learn Microbial Physiology, Cell Biology, bacterial cell organelles, cell wall, cell membrane, Capsule, endospore, flagella, types of flagella, mechanism of flagellar movement.

- To understand Cell inclusions (Gas vesicles, carboxysomes, PHB granules, metachromatic Granules, and glycogen bodies, starch granules, magnetosomes, sulfur granules, chlorosomes.

- To know Microbiology of yeast.

WBAT-102 INDUSTRIAL MICROBIOLOGY PAPER-I

- To understand Industrial Microbiology, Definition & Scope of Industrial Microbiology.

- To understand Historical development in fermentation industry, Microbiology in industry

- To learn Sterilization technique, Concept of asepsis, disinfection.

- To learn Sterilization, Sterilization by Heat, Sterilization by radiation, Filtration& its types

- To know Disinfectant types, action & applications, fumigation, pure culture techniques.

WBAT-103 INTRODUCTION TO BOTANY

- To understand Botany - Definition and Multidisciplinary nature of Botany.

- To know Plant as a living system, Unique features of plants, Plant diversity.
- To learn Morphology of vegetative plant organs, Structure of typical plant, parts of plant .
- To understand Reproductive development, Inflorescence, Types of inflorescence and Significance Of inflorescence, Fruit & its types
- To know the unique features of a plant cell, Cell cycle, cell division, mitosis and meiosis
- To understand Programmed Cell Death- ageing, senescence and necrosis

WBAT-104 PLANT DEVELOPMENT AND ANATOMY

- To know Unique features of plant, Shift from vegetative to reproductive phase & factors Affecting.
- To understand Microsporogenesis, Megasprogenesis, Double fertilization and triple fusion
- To learn Plant growth regulators and their role in growth and development.
- To understand Plant Anatomy Definition, concept, scope and objectives.
- To understand Meristem & Meristematic tissue system: Types of meristematic tissues based on Their position & function.
- To understand Structure & function of simple tissues, Complex tissue, Concept of Mechanical Tissue system Epidermal & Secretary tissue system,
- To know Anatomy of Monocot & Dicot (root, stem & leaf)

WBAT-105 BASIC BIOCHEMISTRY PAPER-I

- To understand Biochemistry, Concept & scope of Biochemistry.
- To know Application of biochemistry in wine science.
- To know water Types of bond, Covalent and non-covalent interactions in biomolecules. Properties of water, biological molecules in water
- To understand Buffers - Biological buffers-concept, types and their importance

- To learn Carbohydrates, Classification of carbohydrates, Functions of Carbohydrate .
- To understand Lipids, Classification of lipids, Structure, chemical and physical properties, Function of lipids.

WBAT-106 METABOLIC PATHWAYS PAPER-I

- To understand Bioenergetics, Concept of bioenergetics, Concept of free energy, Laws of thermodynamics and their relevance to metabolism.
- To know Metabolism: Definitions & Concepts: Catabolism, anabolism, anapleurotic reactions.
- To learn Carbohydrate metabolism, Glycolysis, T.C.A. cycle, Fermentation.
- To understand Electron transport System, Fatty acid degradation- β - oxidation in relation to energy Production.

WBAT-107 BASIC WINE TECHNOLOGY

- To understand Wine making, important terminologies of wine.
- To know Viticulture, Introduction to viticulture, important terminologies.
- To know Wine history.
- To learn Classification of wine: Generic classification, varietal classification, Vinification Classification and classification on the basis of chemical Constituents.
- To understand Flow chart of white wine, Red wine, Sparkling wine, Production of wine from fruits
- To know Grapevine, Classification, function of grapevine.
- To understand Introduction to barrel: Distribution, species and advantages of oak.

WBAT-108 SENSORY EVALUATION OF WINE PAPER-I

- To understand Sensory evaluation and terminologies

- To know the basic tastes of wine, Sensory perception, Factors influencing taste perception.

- To learn the art of tasting wine – color, aroma and taste of wine. Neurophysiological mechanism Of tasting, Sensory evaluation and scorecard, aroma wheel.

- To understand Design of tasting room, timing of tasting wine, Taste the wine on the basis of Vision, smell and palate structure.

- To know Selection & different types of glass, serving wine, Opening the bottle etc.

WBAT 109: PRACTICAL'S BASED ON MICROBIOLOGY

1. To know the Safety Measures and Good Laboratory Practices in Microbiology laboratory.

2. Understand the operation, precautions and use of common microbiology laboratory Instruments

3. To learn the use of common laboratory glass wares, learning basic techniques in Microbiology

4. To know Microscope-Compound Microscope & its parts. Use of oil immersion objective.

5. Basic staining techniques, Monochrome staining, Negative staining, Staining of Endospore Staining of Capsule

6. To Understand the Hanging drop preparation for observation of motility.

7. To know the Preparation of liquid medium -nutrients broth, Sabouraud broth and PDB, agar Medium, agar Slant and PDA

8. Wet Mount slide preparation and its observation – Fungi. Slide culture technique

WBAT 110: PRACTICAL'S BASED ON BOTANY

1. To Understand the Study of typical plant and plant parts

2. To learn Observation of different types of inflorescence in plants.

3. To learn Observation of parts of flower
4. To Understand Study of different types of fruits
5. To learn Study of plant cell types using squash techniques and Maceration
6. To know Study of Programmed Cell Death in plants
7. To Understand Study of meristematic tissue system
8. To know Study of complex and permanent tissue system.
9. To Understand Study of trichomes & secretory tissue system
10. To learn Observation of typical monocot & Dicot root and stem.

WBAT-111 PRACTICAL BASED ON BIOCHEMISTRY

1. To learn Safety Measures and practices in chemistry laboratory.
2. To Understand Molarity, molality, normality, ppm, ppb.
3. To learn Laboratory Equipments: Working Principle and Handling
4. To know Preparation of Buffers of desire pH and Molarity
5. To Understand Determination of alkalinity of water.
6. To learn Titration of Strong acid with the strong base.
7. To know Titration of Weak acid with strong base.
8. Determination of Ascorbic acid.
9. To learn Estimation of reducing sugar by DNSA method.
10. To Understand Paper chromatography& TLC of sugars & amino acids.

WBAT-112 PRACTICAL BASED ON WINE TECHNOLOGY

1. To learn Wine technology Laboratory and common Wine technology laboratory instruments.
2. To Understand Identification of grape and wine varieties.
3. To know small survey and Report writing.
4. To know study threshold detection of acid taste.
5. To Understand study threshold detection of sweet taste.
6. To learn study threshold detection of bitter taste.
7. To Understand study threshold detection of bitter taste.
8. To learn Study of aroma wheel.
9. To Understand types of wine glasses.

SEMESTER –II

WBAT-201 BASIC MICROBIOLOGY PAPER-II

- To understand Microscopy Principles and applications microscope.
- To know Microbial Growth, Reproduction in microorganisms, and Measurement of Bacterial Growth
- To understand staining techniques, properties and role of fixatives, types of stain

WBAT-202 Industrial Microbiology Paper-II

- To understand fermentation medium, Role of nutrients in microbial growth.
- To learn Antifoam agents, Stock cultures and its maintenance
- To know Industrial microbiological products as Primary and secondary metabolites.
- To understand Concept of fermentation and types of fermentation.
- To learn Primary and secondary screening, Strain improvement, Inoculum preparation.

WBAT-203 Plant Physiology

- To know Physiology –Definition, concept.
- To understand Permeability, Diffusion, Osmosis.
- To learn Absorption of water, Transpiration & Guttation, Overview of Photosynthesis & Respiration
- To understand Translocation –Definition, concept, pathway of translocation, Source sink Relationship.
- To understand Stress Physiology, Physiology of Flowering, Seed Germination, and Fruit Ripening.
- To know Response of plants to biotic stresses and abiotic stresses.
- To learn General classification, physiology of flowering, Metabolic changes during seed Germination & fruit ripening.

WBAT-204 Applied Botany

- To understand Methods of Plant Propagation, Sexual propagation and asexual plant propagation
- To learn Vegetative propagation, artificial propagation.
- To know Plant Tissue Culture, Organization of plant tissue culture laboratory,
- Media preparation & Aseptic techniques, its sterilization, Concept of differentiation, dedifferentiation and redifferentiation, Callus formation, organogenesis & embryogenesis.
- To understand Organ culture technique.

WBAT-205 Basic Biochemistry Paper-II

- To learn Proteins, Amino acids and their Classification, Protein structure, Protein denaturation And renaturation, Functions of proteins,
- To understand Enzymes, general properties, enzyme activation and inhibition, Enzyme Classification.

- To know Nucleic acids- Definition, general structure of DNA and RNA.

- Understand the Vitamins Classification, Biochemical functions .

WBAT-206 Metabolic Pathways Paper-II

- To know Protein metabolism, Transamination and oxidative deamination, Nucleic acid Metabolism.

- Understand the Nucleic acid Metabolism.

- To learn Biochemistry of ethanol Fermentation, Concept of Primary & secondary metabolites
Overview of anaerobic fermentations.

- To understand Metabolic Regulation, Concept of homeostasis, Regulation at Enzyme level .

WBAT-207 Basic of Beer, Wine and Alcohol Technology

- Understand the Traditional and Commercial winemaking practices.

- To know Raw materials and equipment use in wine production, Automation in wine industry
New concept in wine production.

- To learn Introduction and History of Brewing, Basic concept of alcoholic beverages
Alcoholic beverage and health, Status of Indian brewing, winemaking and alcohol.

-To understand constituents of oak and liberation of oak flavors from the barrel in beer and alcohol.

- To know Work with barrels, Oak chips versus oak barrels, Pre-fermentation actions.

WBAT-208 Sensory Evaluation of Wine paper-II

- To know Concept of wine clarity, Wine aroma, New trends In the world of wine.

- To learn tasting sheet, matching wine with food, Theory of food combination such as sweet, sour, salty and spicy food with wine.
- To understand pre- tasting organization, tasting situations, tasting exercises, Study of Effervescence, ISO standard glass, Tears.

WBAT 209 Practical's based on Microbiology

1. To know Isolation of bacteria and yeast from natural sources.
2. Observation of the growth of cultures, and reporting of colony and cultural characteristics.
3. To understand Isolation of microorganism by streak plate method, spread plate method
Pour plate method.
4. To learn Yeast for enumeration of yeast by Neubauer's chamber.
5. To know Effect of pH, salts, Temperature, on Microbial Growth.
6. To understand Aseptic Transfer Techniques, Microscopic observation of fungi.
Preservation of cultures on slants.

WBAT 210 Practical's based on Botany

1. To know osmosis and turgor pressure, Diffusion Pressure Deficit, translocation in plants.
2. To understand rate of respiration, Study of stomata and transpiration in plants
3. To learn Separation of leaf pigments by strip chromatography.
4. Preparation of nursery beds and rising of plants by different propagation methods.
5. Understand the Stock solutions & media preparation Effect of plant growth regulators on in vitro response of explants.
6. To know Initiation of shoot tip & axillary bud culture, anther culture

WBAT-211 Practical based on Biochemistry

1. To know Qualitative test for carbohydrate, Lipid/ Proteins.
2. To learn pH measurement Use of pH indicator, Use of pH meter
3. Understand the Carbohydrate estimation by phenol sulphuric acid method,
4. To know Paper chromatography of amino acids, TLC of lipids
5. To understand Protein estimation Folin Lowry method. Biuret method.
6. Extraction of lipids in organic solvents, Enzyme assay, Determination of chlorine content in water.

WBAT-212 Practical based on Wine Technology

1. To know scoring of wine using different tasting sheet.
2. Understand the Sensory evaluation, matching wine with food.
3. learn the Effect of age on the appearance, serving temperature, sensory evaluation of wine.
4. Understand the Interaction of sweet and acid taste, bitter taste.
5. The sense of feel, Identification of off odors in wine.

S. Y. B. SC WINE TECHNOLOGY

SEMESTER III

WBAT - 301: Yeast Technology – I

- Understand the Importance of yeast strains in wine making.
- Maintenance of yeast strains and preservation of it, Yeast culture techniques.
- Learn the Normal micro flora and pathogens of grapevine.
- To know Types of microbial spoilage of wine, Prevention of microbial spoilage curing and storage of wine.

WBAT-302-Fermentation-I

- To study about fermentation process and various types of ferment .

- The learner will acquire the knowledge of various parts of ferment.
- To study about the manufacturing process of fermentor.
- To learn about various utilities required for fermentation

WBAT-303 Brewing Technology-I

- To introduce students to the range, quality & selection of raw materials used in Brewing process.
- Introduction to the methods & equipments required to Beer making process.
- Learn about structure & composition about malted barley.
- Study the malting process.
- Demonstrate & understanding the science underlying the conversion of raw materials to wort.

WBAT-304- Alcohol Technology-II

- Study of alcohol technology facilitates & guiding for future use.
- Introduction & working of Enzymes.
- To learn the processes of molasses handling.
- Learn the techniques about Yeast handling ; its propagation under plant condition.
- Knowledge about various calculations i.e Stoichiometry ,efficiency & recovery etc.

WBAT-305 Biochemistry – III

- Study the general methods of extraction & purification of metabolites.
- Learn the different techniques of Centrifugation, Crystallization, ion exchange, Electro dialysis & Solvent extraction.
- Study the Phenolic compounds present in wine.
- Understand the process of Malolactic fermentation & its role in wine making process

WBAT – 306: Vineyard Technology – I

- To understand the study of soil and its function, Physical and Chemical properties of soil.
- Learn the Principles of weathering of rocks and materials.
- To know Study of vineyard establishment, Relationship of grapevine and climatic factors.
- To understand Selections of grape (wine grapes) varieties for plantation, Method of plantation.
- Learn the Care of young vine, Weed control.
- To understand Definition and concept of canopy, Canopy microclimate, Training and pruning Practices.

SEMESTER IV

WBAT –401: Yeast Technology – II

- To understand the Preparation of yeast starter cultures, contamination of yeast, growth of yeast.
- To know Role of yeast in grape flavor development, transformation of Aromatic substances.
- Learn the Significance of yeast and bacterial enzymes.
- Controlling degree of anaerobiosis, Killer factors in fermentation.

WBAT-402-Fermentation-II

- To study the process of optimization.
- To learn about the various process parameters and their importance.
- To know about the immobilization of whole cells and enzymes.
- To understand the computer applications in process controls.

WBAT – 403- Wine Technology – I

- Understand the Red wine – objectives, red wine varieties and styles, making of rose style wines.
- To know red wine making process, differentiate it from white wine making.
- To learn evaluation of a number of Australian red wine styles, Red wine making process.
- Learn the Bottling- maturation in bottle.
- To understand the Influence of climate, temperature, humidity& seasonal fluctuations.
- To know managing wine grape garden under aberrant climate conditions.

WBAT-404-Wine Technology-II

- To learn the Production of white wine, White Wine objective, Varieties and style.
- To understand the physiology of grape : Component, principal, location, fate.
- To know White wine making process, Harvesting, crushing, pressing, juice, addition of active yeast
- Control of fermentation parameter, Clarification and stabilization, Maturation and aging.
- Understand the Blending, bottle aging and post bulk operation.
- To know Cooperage for wine making, oak barrel making in world.
- To learn Racking: role and technique, Theory of protein fining, Fining teachings, and products used in Fining, Clarification treatment.

WBAT – 405- Vineyard Technology – II

- To learn the different propagation techniques, Collection and storage of cuttings.
- To know Propagation of own rooted vines, grafted vines, grafting technique, budding techniques.
- To understand the grape and its maturity, composition of mature grape.

-Development stages of grape, berry morphology, Changes in grape during maturation.

-Learn the Study of harvesting techniques and machinery, hand harvesting:, machine harvesting.

-To understand the Plant management program, Study of different disease and pest, different Disorders, different nutrient deficiency.

(WBAT-223) BIOCHEMISTRY – II

-To know Study of microbiological control of wine during storage.

-To learn Study of causes of food spoilage.

-Understand the characteristics and storage condition of Food.

- To know Concept of mechanical damage with Example.

-To learn Distinguish between French oak & American oak and its components

WBAT – 224: Waste Treatment – I

-To understand the Fermentation industry waste, Wastewater composition, characterization studies

- Learn the Physical Unit Operations, Flow measurement, Screening.

- To know Accelerated gravity separation, Flotation, Granular medium filtration.

- Understand the Chemical Unit Processes, Chemical precipitation, Disinfection, Dechlorination.

-To learn the Biological Unit Processes: Aerobic, Anaerobic, Denitrification, and Biosorption.

WBAT – 225: Waste Treatment – II

- To learn the Removal of phosphorus, toxic compounds and refractory organics.

- To understand the Sludge treatment and disposal.

- To know In-situ bioremediation, Design principles and designing of ETPs.

- Understand the Troubleshooting, Environmental Impact Assessment.

S.Y.B.Sc. WINE TECH.

SEMESTER III AND IV PRACTICALS

WBAT-309 + WBAT-409-COURSE – I

1. To know Isolation and purification of wine yeast from stock culture, flowers, fruits and berries.
2. Understand the Measurement of growth of wine yeast, bacterial count, direct cell count and total viable count, count of yeast from the wort and wine.
3. To learn Inoculum development of yeast and determination of exponential phase of growth.
4. To understand Determination of proteolytic activity of yeast strain during fermentation.
5. To know Strain development of yeast for tolerance to higher alcohol and SO₂ concentrations.
6. Homemade wine production: grape, jamoon, pomegranate or any other fruit.
7. To understand Microscopic observation of yeast during wine production.
8. To know Determination of the course of fermentation and the rate of alcohol production.
9. Whole cell immobilization of yeast. Determination of the sugar alcohol

Conversion coefficient in immobilized and free cell systems.

10. To understand Determination of the ability to produce acetic acid by yeast strain.

11. To learn Determination of the aptitude to form sulfite and sulfide (H₂S) by yeast strains

WBAT-310+WBAT-410-COURSE – II

1. To learn Collection of soil sample and determination of N,P,K.

2. To know Studies on fruit-bud differentiation by visual identifications.

3. To understand the Propagation techniques for grapes: budding and grafting

4. To know Pruning techniques for grape vine and harvesting technique for grapes

5. To learn Preparation of solutions and mixtures: Bordeaux mixture, antibiotic and plant growth Regulators.

6. To know Study of morphology, anatomy and microscopic features of grape(Microscopy)

7. To understand the Determination of pH, total and volatile acidity of grapes

8. Determination of total soluble solids of grape by hand refractometer

9. To learn Determination of reducing sugar of grape juice by Fehling method

10. To know Determination of total carbohydrates by Anthrone method.

11. To learn Estimation of proteins, tannins, ethanol, anthocyanins and metals from grapes and wine.

12. To understand the Analysis of wine components as per IS specifications by IS 7585:1995.

13. To know Determination of total and volatile acids of the grape / wort / wine IS7585:1995

14. To learn Determination of volatile acidity from wine by anion exchange column method.

WBAT-311+WBAT-411-COURSE – III

1. To know Analytical tests for identification of wine sediments: Potassium bitartrate, Calcium tartarate, copper case, yeast and bacteria cells

2. To learn Wine fermentation: standardization of yeast Inoculum and nutrient medium for wine Production.
3. To understand the Sensory assessment of berry Identification of pests and diseases of grapes.
4. To learn Selection of pesticides, timing, safe and efficient use.
5. To know Identification of wine grape variety and rootstock by visual observations.
6. To understand the Berry sampling, methods and prediction of harvest date.
7. To understand the Study of point quadrat method for canopy management.
8. To learn Study of fruitful bud for determination of pruning method.
9. Preparation of vineyard score card and evaluation of vineyard.
10. To understand the To know Comparison of total and volatile acidity of grape, wort, and wine
11. To learn Detection of phage contamination in wine

T. Y. B. Sc. WINE BREWING AND ALCOHOL TECHNOLOGY

SEMESTER-V

WBAT-351 Basic Chemical Engineering

- To understand Basic Fluid flow and fluid mechanics, Properties of liquids, Measurement of Viscosity, handling systems for Newtonian liquids.
- To know Mechanical Energy Balance, Pump Selection and Performance, Flow Measurement.
- To learn Liquid filtration, filter media, classification of liquid filtration, formation of filter cake.
- To understand Membrane filters, ultrafiltration microfiltration Sizing of filtration equipment.
- To learn Heat Transfer and Thermal Processing, heating and cooling of liquids, Plate heat.
- To learn Energy for Wine Processing, Steam generation, Electric Power utilization.

WBAT-352 Equipment & Utilities

- To understand Utilities, Electric supply, humidifiers, Air-conditioning, humidifiers, Dehumidifiers, Chilling system, Gas Supply, Lighting, Catwalks and man ways, Computers.
- To learn Equipments, Process equipments, Cleaning, Hygiene and Sanitation equipments.
- To know Material handling equipments, Functions, types, and uses of Pallet jacks, Forklifts, Man lifts, Barrel racks, Loading/Unloading bay/ platforms, Wine transfer pumps.
- To learn Packaging equipments Functions, types, and uses of bottling machines.
- To understand Special Lab equipments, sparkling wine making equipments.

WBAT-353- Health benefits of alcoholic beverages -I

- Study the major wine antioxidants.
- Learn the different functions of wine antioxidants in human beings.
- Study the anti-degenerative diseases.
- Understand the synergism of alcohol and antioxidant in wine.

WBAT-354- Microbial spoilage and other defects

- To understand Grapes sampling: Random berry sampling, whole cluster sampling.
- To learn Grapes handling: Receiving fruit at winery, use of dry ice.
- To know Pressing Destemming Sanitizing methods, cleaning the presses, hoses, tanks and all Equipment.
- To understand Selection of yeasts & consumables, Fermentation process Barrel Fermentation, aging.
- To know Malo-lactic fermentation, Post fermentation racking, Blending, Fining and filtration
- To learn Packaging, choice of bottles, shape and color, labels and capsules, screw cap.
- To know Temperatures of bulk wine storage, bottled wine storage.

WBAT355: Marketing of Alcoholic beverages

- To understand Fundamentals of Marketing & Basic Wine Marketing Principles , 4P`s of Marketing
- To understand Fundamentals of Marketing Management , Importance and functions of Marketing Management & Henri Fayol 14 principles

- To understand Buying Motives of Wine, Beer and Alcohol Consumers , Importance of Studying Buying Behavior & Factors influencing buying behavior , Buying Decision Process
- To understand Basics of Branding and Marketing Strategies & Difference between Brand and Branding , Basics of Brand Positioning , Wine, Beer and Alcohol Branding
- To understand Digital /Social Media Marketing of Wine, Brewing and Alcohol & Importance of Digital Marketing in Beverage Industry
- To understand International Marketing & Types of International Marketing (Export, Franchising, Licensing, Joint Venture) , International Marketing strategy
- To understand Business Environment in Alcohol Industry & Introduction to Business Environment , Important Environmental Factor of Brewery, Winery Distillery , Study of SWOT Analysis technique
- To understand Marketing Techniques used by Alcohol Industry (Advertisement Management) , Surrogate Marketing , Define Advertising & Importance of Advertising & Other marketing technique (Case study)

WBAT-356: Business Management

- To know ,meaning of management,management thoughts
- Learn the ,functions of the management,different management approaches,administrative approach
- To understand ,planning and organizing about management,staffing,recruitment directing and level of management
- To know principle of the entrepreneurship,type of entrepreneurship(small,large,startups)
- To learn,e-business,business communication,
- To develop skill, good speaking,listening, interview skills

WBAT - 357: Practical course – I

- Measurement of properties of liquids (must, wine, sugar syrups etc) using Specific gravity bottle and Hand held refractometer
- Calculation of heat load, chilling plant specifications etc, using a laboratory Plate heat exchanger/ shell & tube heat exchanger
- Measurement of viscosity of liquids using Capillary tube viscometer, Rotational viscometer
- Measurement of flow of liquids using Orifice meter and Venturi meter
- To study the characteristics of simple distillation and Calibration of pH meter.

-To study the filtration of liquids through cake filters and Practical calculation of refrigeration loads for wine storage

-Estimation of thermal death coefficient k for normal wine contaminants

-To study CIP process in winery /brewery /distillery

-Demonstration of principal and working process of filtration unit

-Demonstration of principal and working process of Crusher and destemmer

WBAT - 358: Practical course – II

-Effect of glucose and NaCl concentration on yeast growth.

-Effect of variable pH on yeast growth

-Determination of sensitivity of yeast to antibiotic streptomycin.

-Study of normal flora of grape berry and leaf.

-Identification of lactic acid bacteria by biochemical methods.

-Identification of acetic acid bacteria by biochemical method.

-Isolation of spoilage micro organism from wine sample.

-Experiment the practical techniques to solve harsh tannin defects and excessive acidity defect in given wine

-Case study on Microbial ecology during vinification: natural flora of grapes and other fruits, interactions of microorganisms, host-pathogen interaction

-Comparative Study on oxidized effect in white wine i.e oxidized wine vs. non oxidized wine and to verify the resistance of wine to air.

WBAT - 359: Practical course – III

-To Study the Profiles of Indian Alcohol Companies and compare Marketing Strategies of Various Alcoholic Brands (Any one Sector Wine/Beer/Alcohol)

-To Study the Digital Marketing / Social Media Marketing Campaign of Wine / Beer / Liquor Brand

-Case Study on Consumer Buying Behaviour Pattern (National/ International)

-To study and Compare Pricing strategies across various alcoholic brands in same sector and design your own Pricing strategy of either Wine/Beer/Alcohol

-To Study Bottle Labelling and Packaging

-Presentation (PPT) on Branding Strategies of Particular Wine, Beer, Alcohol Brand

-To develop SWOT Analysis of any Wine/Beer/ Liquor Brand

-To study the Organisation structure of any Winery/Brewery/Distillery

WBAT- 3510 Bio analytical Techniques

-To understand Labsafety,scientificnotationandunits,biochemicalcalculations,buffer solutions, measurement of pH.

-To understand Spectroscopy & The electromagnetic spectrum , Concept and measurement of transmittance and absorbance , Beers Lamberts law, molar extinction coefficient, limitations of Beers Lamberts law , Types of spectrometers–UV & visible; Principles, Instrumentation and Applications

-To understand Centrifuge: General principle- sedimentation velocity, sedimentation equilibrium , Types of centrifuges: preparative and analytical centrifugation, Differential centrifugation, density gradient, ultracentrifuge & Applications

-To understand Chromatographic Techniques:Planar Chromatography , Partition chromatography: Thin layer chromatography, paper chromatography , Column chromatography–columns, stationary phases. Packing of columns, application of sample, column development, fraction collection and analysis , Adsorption chromatography: Ion Exchange Chromatography, Size exclusion chromatography

-To understand Electrophoresis: General principle, factors affecting electrophoresis voltage, current, resistance, buffer, composition, concentration, pH, Agarose Gel electrophoresis , SDS-PAGE–Native and denaturing gels, Applications

WBAT- 3511 Computer aided applications

-To understand Computer Fundamentals ,Overview to computer system ,Types of computers, Introduction to hardware and software , Types of software , Application software , Representation of data , Components of computer – CPU, Memory , Input and Output devices- keyboard, mouse, monitors, printers, Storage devices- types of storage devices, magnetic storage devices, optical storage devices

- To understand Operating system & Type of operating system , Basic and advance operating system, Working of operating system , Environment for operating system ,Application of different operating system.

-To understand Internet and e-mail applications & History and uses of internet , Connecting to internet

SEMESTER-VI

WBAT-361: Sensory evaluation of wine, beer & alcohol

-To carry out the project in the format for dissertation.

-Visit the winery and understand the working.

-To collect the photograph of various operation.

-Prepare the project report under the suitable guide.

WBAT-362:Waste treatment paper II

-Understand the concept of Fruit wine.

-Study the method of preparation of fruit wine Ex. Banana wine, Orange wine, Guava wine & Strawberry Wine.

-Understand the concept of Fortification.

-Study the concept of carbonate & non carbonated beverages.

-Understand the concept of fortified wines with example.

WBAT -363: Health Benefits of Alcoholic Beverages -II

. -Study the nutritional aspects of Beer.

-Learn the different macronutrients contents of alcoholic beverages.

-Study the anti-degenerative diseases.

-Understand the synergism of alcohol and antioxidant in wine.

- To know the Nutritional value of Alcoholic beverages.

- Learn the metabolism of alcohol process by different enzymes.

- Study the harmful effects of excessive alcohol intake.

WBAT-364-Maturation and aging of alcoholic beverages

-To know about historical background of wine laws.

-To study about various wine laws.

-To study about the Patents and secret process.

- To Understand the purchase large amounts of wine & store it in their own warehouses.

- To know Laws governing Wine sales, taxation of wine, shipping.

WBAT-365: Alcohol marketing laws regulatory polices

- Understand the Marketing

- To know The Global Wine market – Leading producers and regions, Top markets.

- To learn Principles, logistics, and strategies of wine marketing and sales.

- Understanding the market and finding a niche, and developing a successful plan.

- To know Case studies of real world examples from both wine and business experts.

- To learn Indian wine market – Study of facts and figures.

WBAT-366: Wine Technology -III

- Conduct the seminar on related topic.
- Give idea about the presentation skill, posture and gesture.
- Test the knowledge of student in subject area.
- prepare the presentation and report regarding the seminar.

WBAT- 367: Practical's course –I

- Calculate BOD of given sample(waste water /winery effluent)
- Calculate COD of given sample(waste water /winery effluent)
- To determine the TSS and TDS from the given sewage sample
- Confirmed test of coliform bacteria and Completed test for coliform bacteria
- The organization of wine evaluation: the space, equipment, temperature, order of serving the wines
- Performing and methods of sensory assessment (pair, three-angel, duo-trio test, the differentiation test, ranking test hedonic rating test and description analysis).
- Perform sensory evaluation of beer
- Perform sensory evaluation of wine and scoring it

WBAT- 368 : Practical's course – II

- Identify the type of haze formed in wines: proteins, pectin and glucans
- To determine the moisture content and sterility of cork and Sterility checking of bottled wines
- Determination of total sugar as invert sugar in final molasses
- Lab trial of molasses /starch based fermentation in distillery
- Determine reducing sugar of wine by rebelein method
- Determination of Specific Gravity & Extract of wort.

-Determine the protein content of given wine /beer by lowry/ biuret method

-Estimation of alcohol content of beer by hydrometer and specific gravity method