Sagar Bahhuddeshiya Shikshan Sansthas

Sagar B.C.A.College

Principal | President | Secretary

Dr.V.V. Mahajan | Mr.S.B.Tanpure | Mrs.P.M.Tarakh

Devmurti Tq.Dist.Jalna | 9423748305, 9359532363

No: Date. 1 / 7 /2017

1.3 Curriculum Enrichment

1.3.1 Institution integrates crosscutting issues relevant to Professional Ethics ,Gender, Human Values ,Environment and Sustainability into the Curriculum

Our Institute is affiliated to Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. Here we follow the curriculum of University. In the curriculum of University all points like professional Ethics,Gender, Human Values, Environment and sustainability are already included. Subject wise cross-cutting Issues reflected in paper wise syllabus are collected from the staff. The institute focuses on effective implementation of these issues, in teaching. The complimentary programs are also organized simultaneously,university offered us three compulsory subjects like environment studies,constitution of india,compulsory computer course for students to embibe the above values,and learning.

1. Professional Ethics:-

In institute we observe professional Ethics through-out teaching learning, research, student
admissions, staff recruitment and implementation of government and University polices. A special code of conduct is prepared by institution for all stake holders.For learning we have communication skill (BCA)as well as English communication skill as a subject,we also have marathi/hindi subject for detail understanding of languages.Details of the term are reflected in curriculum of BCA ,BCS,MLIB

2. Gender:-

We strictly adhere to the government law 2013 of sexual harassment of women at work place and UGC guidelines for same 2016. Every year we organize genders sensitization programs like seminars, conferences and workshops in association with Maharashtra State Commission for Women Mumbai and National

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Commission for Women New Delhi. Every year we observe international women day on 8th march. They are given a special respect and a chance to express themselves on the stages. A special health checkup camp and H.B. detection camp is organized for girl students and lady staff members. We have ladies common room and day care centre for young babies. There is separate reading section for girls in Library. Anti-ragging cell, counseling committee and discipline committee looks after the safety and security of girls.

3. Human Values:-

Besides Human Rights, We observe human values in college administration and through-out working of the institute. International non- violence of is observed in college every year, on 2nd October, on occasion of Gandhi Jayanti. Department wise Add-on courses for human values organized in institute for students. Human values are reflected in the University curriculum of M.LIB (Master of library and information science) Special guest lecture are organized for presentation and promotion of human rights and justice.

4.Environment :-

Institute has its own green policy and environment policy. Botanical garden with all medicinal plants helps students to study new species. We observe vehicle free Saturday as pollution free activity. On 2nd October we organize cleanliness drive with the help of NSS volunteers. student's environment science is a compulsory subject offered by University.

5. Sustainability:-

The college has its own polices prepared as per the vision and mission statement of the college. We have separate waste management system for solid, liquid and e-west in the campus. We have ground harvesting system.In M.lib we offered rural and community information system,health information system. Sustainability related cross cutting issues are included in the University curriculum of BCA,BCS,M.lib.

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NAAC Re-accredited A Grade

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डॉ. बाबासाहेब आंबेडकर
मराठवाडा विद्यापीठ
औरंगाबाद-४३१००४. महाराष्ट्र (भारत)
नॅक समितीतर्फे अ दर्जा प्राप्त

Office : Director, Board of Examination & Evaluation
कार्यालय : संचालक, परीक्षा व मुल्यमापन मंडळ

SAGAR BCA COLLEGE ★ DEVMURTI, TQ.DIST. JALNA ★

संदर्भ क्र. परीक्षा/समन्वय/२०२३/ 3743

दिनांक २८.०३.२०२३

Compulsory Six Month Course in Environmental Studies

Dr. Babasaheb Ambedkar Marathwada University ★ Examinations ★ Aurangabad

प्रति,
प्राचार्य/संचालक,
सर्व संलग्नित महाविद्यालये/परिसंस्था,
डॉ. बाबासाहेब आंबेडकर मराठवाडा विद्यापीठ,
औरंगाबाद.

विषय : पर्यावरण (अनिवार्य) ची परीक्षा दिनांक ०२.०४.२०२३ रोजी घेणेबाबत. (सत्र-मार्च/एप्रिल, २०२३)

महोदय/महोदया,

उपरोक्त संदर्भांकित विषयास अनुसरुन आपणांस कळविण्यात येते की, विद्यापीठाच्या विद्यापरिषद व परीक्षा मंडळाच्या निर्णयानुसार Compulsory Six Months Course in Environmental Studies या विषयाची परीक्षा विद्यापीठातर्फे पदवीच्या द्वितीय वर्ष (चौथे सत्र) घेण्याचे ठरलेले आहे. याबाबत आपणास परीक्षा आयोजनासंबंधी खालील प्रमाणे सूचना करण्यात येत आहे :-

१) द्वितीय वर्षाच्या "**Environmental Studies**" हा अभ्यासक्रम मार्च/एप्रिल २०१० च्या परीक्षेपासून सर्व पदवी स्तरावरील वर्गांसाठी अनिवार्य करण्यात आलेला असून काही अभ्यासक्रम/विद्यार्थी यांना वगळण्यात आलेले आहेत. खालील प्रमाणे आहेत.

क) जे विद्यार्थी बी.एफ.ए. किंवा बी.एड. अभ्यासक्रमास प्रवेशित असतील असे.

तसेच

ख) ज्या विद्यार्थ्यांना पदवी अभ्यासक्रमामध्ये "Environmental Science" हा ऐच्छिक विषय घेतलेला असेल.

तसेच

ग) बी.एस्सी. बायोटेक पदवी अभ्यासक्रमामध्ये हा विषय घेतलेला असेल असे.

२) या विषयाची लेखी परीक्षा ७५ गुणांची असून सदरची लेखी परीक्षा विद्यापीठातर्फे घेण्यात येईल.

३) **Environment Studies या विषयाची परीक्षा रविवार दिनांक ०२.०४.२०२३ रोजी दुपारी १२.०० ते २.०० वाजे पर्यंत विद्यार्थी शिक्षण घेत असलेल्या महाविद्यालयातच (Home Centre) प्राचार्यांच्या नियंत्रण व मार्गदर्शनाखाली घेण्यात येणार आहे.**

४) सदर परीक्षेसाठी Multiple Choice Question Paper Cum- Answer Sheet च्या आवश्यक प्रती सर्व संबंधित महाविद्यालयांना विद्यापीठामार्फत पुरविण्यात येतील.

५) सदरील पेपरच्या प्रश्नपत्रिकेची (Multiple Choice Question Paper) उत्तरे (Answer Key) विद्यापीठाच्या www.bamu.ac.in/ किंवा bamua.digitaluniversity.ac/compulsory / Environment Studies या वेबसाईटवर दिनांक ०७.०४.२०२३ रोजी उपलब्ध करण्यात येईल व ती पुढील आठ दिवसाकरिता वेबसाईटवर उपलब्ध असेल.

कृ.मा.पहा

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पर्यावरणशास्त्र परीक्षा उत्तीर्ण होणेसाठी ३५% गुण आवश्यक आहे. (लेखी परीक्षेसाठी २६ गुण आणि [illegible] गुण अनिवार्य आहेत) अंतर्गत व लेखी परीक्षांच्या संपादित गुणाबाबत व इतर माहितीबाबत विद्यापीठाच्या शैक्षणिक विभागाने परिपत्रक क्र ACAD/NP/COMP.SCI./ENV.SCI. /2008 / 6587-6786 दिनांक २०.०६.२००८ चे अवलोकन करावे.

संबंधित महाविद्यालयामध्ये उत्तरपत्रिका तपासून झाल्यानंतर अंतर्गत आणि सदर लेखी परीक्षेचे गुण व त्यांची एकूण बेरीज गुणांच्या यादीमध्ये दर्शविण्यात यावी.

उत्तीर्ण झालेल्या विद्यार्थ्यांच्या संख्येइतक्या प्रमाणपत्राच्या प्रती विद्यापीठाच्या परीक्षा विभागातील भांडार कक्षाकडून प्रत्यक्ष प्राप्त करुन घ्याव्यात. महाविद्यालयांनी सदर प्रमाणपत्रामध्ये संबंधित विद्यार्थ्याचे नांव, एकूण प्राप्त गुण इत्यादी बाबींची नोंद करावी व त्यावर प्राचार्यांच्या स्वाक्षरी (स्वाक्षरीचा शिक्का नव्हे) व महाविद्यालयाच्या शिक्क्यासह अशी प्रमाणपत्रे व मुळ गुणयाद्या परीक्षा विभागातील संबंधित कक्षामध्ये जमा कराव्यात. त्यानंतर परीक्षा नियंत्रकांच्या सही शिक्क्यासह सदरील प्रमाणपत्रे विद्यार्थ्यांना वाटप करण्यासाठी संबंधित महाविद्यालयांना परत करण्यात येतील.

महाविद्यालयास पुरविण्यात आलेल्या प्रश्नपत्रिका-नि-उत्तरपत्रिका तसेच Field Note Books / Practical Books etc. पुढील आदेशापर्यंत महाविद्यालयामध्ये सुस्थितीत ठेवाव्यात. यथावकाश त्या विद्यापीठातर्फे जमा करण्यात येतील.

सदर परीक्षेचे प्रमाणपत्रे संबंधित महाविद्यालयांनी विद्यार्थ्यांना वितरीत करावयाची असून आवश्यक तितकी कोरी प्रमाणपत्रे विद्यापीठातर्फे पुरविण्यात येतील. सदर प्रमाणपत्रे ही प्राचार्यांच्या सही व महाविद्यालयाच्या शिक्क्यासह संबंधित महाविद्यालयाने वितरीत करावयाचे आहेत.

विद्यार्थ्यांनी सदरील प्रमाणपत्राची साक्षांकित प्रत तृतीय वर्षाच्या अंतिम वर्षाच्या परीक्षेसाठी दाखल करावयाच्या परीक्षा आवेदनपत्रासोबत सादर करावयाची असून विद्यार्थ्यांच्या अंतिम वर्ष परीक्षेचा निकाल त्याखेरीज घोषीत करण्यात येणार नाही.

सदरील परीक्षा ही ज्या त्या महाविद्यालयात (Home Center) होणार असल्यामुळे सर्व संबंधीत महाविद्यालयांनी QPDS चे माहिती भरावी त्या शिवाय प्रश्न पत्रिका डाऊनलोड करता येणार नाही व विद्यार्थी परीक्षेपासून वंचित राहू शकतात म्हणून कृपया QPDS चे माहिती सर्व संबंधीत महाविद्यालयांनी भरुन घ्यावी.

कृपया सदर परिपत्रक सर्व विद्यार्थी व संबंधित शिक्षक व प्रशासकिय कर्मचाऱ्यांच्या निदर्शनास आणावे व वरील निर्णयाची लवजावणी काटेकोरपणे करुन विद्यापीठास सहकार्य करावे, ही विनंती.

Dr. Babasaheb Ambedkar Marathwada University ★ Examinations ★ Aurangabad ★

प्रा. डॉ. भारती गवळी
संचालक
परीक्षा व मूल्यमापन मंडळ

याची एक प्रत उपकुलसचिव, गोपनिय कक्ष यांचे सह सर्व विभागप्रमुख व कक्ष प्रमुख, परीक्षा विभाग डॉ. बाबासाहेब आंबेडकर उवाडा विद्यापीठ, औरंगाबाद यांना माहिती व योग्य त्या कार्यवाहीस्तव.

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नॅक समितीतर्फे अ दर्जा प्राप्त

Office : Director, Board of Examination & Evaluation
कार्यालय : संचालक, परीक्षा व मुल्यमापन मंडळ

संदर्भ क्र.: परीक्षा/ २०२३/3747 दिनांक : ३१.०३.२०२३

परिपत्रक

प्रति,
प्राचार्य/संचालक
सर्व संलग्नित महाविद्यालय/परिसंस्था,
डॉ. बाबासाहेब आंबेडकर मराठवाडा विद्यापीठ,
औरंगाबाद.

विषय: भारतीय राज्यघटना (Constitution of India) या विषयाच्या परीक्षेबाबत.
संदर्भ: शैक्षणिक विभागाचे पत्र क्र.SU/Con./I Yr/Cur/2022/7416-25 दिनांक २८.०१.२०२०.

महोदय/महोदया,

उपरोक्त विषयी संदर्भिय पत्राच्या अनुषंगाने आपणास कळविण्यात येते की, संदर्भिय पत्रान्वये शैक्षणिक वर्ष २०२०-२१ पासून पदवी अभ्यासक्रमाच्या प्रथम वर्षासाठी Constitution of India हा विषय अनिवार्य करण्यात आला आहे. त्यानुसार प्रस्तुत विद्यापीठाच्या **मार्च/एप्रिल २०२३ च्या सुरु असलेल्या पदवी अभ्यासक्राच्या प्रथम वर्षासाठी भारतीय राज्यघटना (Constitution of India) या विषयाची परीक्षा दि. ०२.०४.२०२३ रोजी दुपारी ३.०० ते ४.३० या वेळेत घेण्यात येणार आहे.**

सदरील परीक्षा ही ज्या त्या महाविद्यालयात (Home Center) होणार असल्यामुळे सर्व संबंधीत महाविद्यालयांनी QPDS ची माहिती भरावी त्या शिवाय प्रश्न पत्रिका डाऊनलोड करता येणार नाही व विद्यार्थी परीक्षेपासून वंचित राहू शकतात म्हणून कृपया QPDS ची माहिती सर्व संबंधीत महाविद्यलयांनी भरुन घ्यावी. तसेच सदर परीक्षेसाठी आवश्यक असणाऱ्या उत्तरपत्रिका ह्या आपल्या महाविद्यालयाच्या जवळ विद्यापीठाच्या परीक्षेसाठी जे परीक्षा केंद्र सुरु आहे, त्या महाविद्यालयातून प्राप्त करुन घ्यावयाच्या आहेत. संबंधीत जवळच्या परीक्षा केंद्रावर उत्तरपत्रिका उपलब्ध नसल्यास तसे या विभागास दुरध्वनी क्र.०२४०-२४०३१९६ व मोबाईल क्र. ७९७२२१७९५४ या क्रमांकवार श्री. पंडीत साळुंके यांचेशी त्वरीत संपर्क साधावा व उत्तरपत्रिका प्राप्त करुन घ्याव्यात.

सदर परीक्षा संपल्यानंतर सर्व उत्तरपत्रिका जमा करुन त्या आपल्या महाविद्यालयातील राज्यशास्त्र व लोकप्रशासन या विषयाच्या अद्यापकाकडून तपासून घ्याव्यात व **त्यांच्या प्राप्त गुणांची यादी (बैठक क्रमांक प्राप्त गुण) या कार्यालयास १० दिवसात सादर करावी. संबंधीत विषयाची उत्तरपत्रिका Answer Key सदर विषयाची परीक्षा संपल्यानंतर त्याच किंवा दुसऱ्या दिवशी विद्यापीठामार्फत online पध्दतीने आपणांस विद्यापीठाच्या https://bamua.digitaluniveristy.ac वर उपलब्ध करुन देण्यात येईल.**

तरी सर्व संबंधितांनी याची नोंद घेवून सदर परीक्षेसाठी आपल्या महाविद्यालयातील प्रवेशित विद्यार्थ्यांच्या संख्येनुसार आवश्यक असणारी आसन/बैठक व्यवस्था तयार ठेवावी व सदरबाब सर्व विद्यार्थी, अद्यापक व पालक यांचे निदर्शनास आणून द्यावी तसेच सदर परीक्षेपासून एकही विद्यार्थी वंचित राहणार नाही, याही कृपया नोंद घ्यावी.

संचालक
परीक्षा व मूल्यमापन मंडळ

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NAAC Re-accredited A Grade

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SAGAR BCA COLLEGE ★ DEVMURTI, TQ.DIST. JALNA ★

डॉ. बाबासाहेब आंबेडकर
मराठवाडा विद्यापीठ
औरंगाबाद-४३१००४, महाराष्ट्र (भारत)
नॅक समितीतर्फे 'अ' दर्जा प्राप्त

Office : Director, Board of Examination & Evaluation
कार्यालय : संचालक, परीक्षा व मूल्यमापन मंडळ

संदर्भ क्र. परीक्षा/समन्वय/२०२३/ ३७५५ दिनांक २८.०३.२०२३

Compulsory Computer Science for First Year

Dr Babasaheb Ambedkar Marathwada University ★ Examinations ★ Aurangabad

प्रति,
प्राचार्य/संचालक,
सर्व संलग्नित महाविद्यालये/परिसंस्था,
डॉ. बाबासाहेब आंबेडकर मराठवाडा विद्यापीठ,
औरंगाबाद.

विषय: संगणकशास्त्र (अनिवार्य) ची परीक्षा दिनांक ०२.०४.२०२३ रोजी घेणेबाबत. (सत्र-मार्च/एप्रिल, २०२३)

महोदय/महोदया,

उपरोक्त संदर्भांकित विषयास अनुसरुन आपणांस कळविण्यात येते की, विद्यापीठाच्या विद्यापरिषद व परीक्षा मंडळाच्या निर्णयानुसार **Compulsory Computer Course** (अनिवार्य) च्या विषयाची परीक्षा विद्यापीठातर्फे पदवीच्या प्रथम वर्षाच्या द्वितीय सत्रासाठी घेण्याचे ठरलेले आहे. यावाबत आपणास परीक्षा आयोजनासंबंधी सविस्तर माहितीसाठी खालील प्रमाणे सूचना करण्यात येत आहे :-

१) पदवी अभ्यासक्रमांच्या प्रथम वर्षासाठी **Compulsory Computer Course** (अनिवार्य) मार्च/एप्रिल २००९ या परीक्षेपासून हा विषय अनिवार्य करण्यात आला आहे. त्याच बरोबर काही अभ्यासक्रम त्यामधून वगळण्यात आलेले आहेत ते खालील अभ्यासक्रमविद्यार्थ्यांना वगळण्यात आलेले आहे.

क) ज्या विद्यार्थ्यांचे एच.एस.सी. अभ्यासक्रमाचे कॉम्प्युटर किंवा आय.टी. हे विषय ऐच्छिक असतील असे.

तसेच

ख) जे विद्यार्थी **MS-CIT**, सर्टिफिकेट कोर्स इन कॉम्प्युटर, आय.टी. किंवा डिप्लोमा इन कॉम्प्युटर सायन्स परीक्षेचे प्रमाणपत्र धारक असतील असे.

तसेच

ग) ज्या विद्यार्थ्यांना पदवी अभ्यासक्रमामध्ये "कॉम्प्युटर सायन्स" किंवा "आय.टी." हे ऐच्छिक विषय असतील असे.

तसेच

घ) बी.एस्सी. बायोटेक पदवी अभ्यासक्रमामध्ये हा विषय घेतलेला असेल असे.

२) या विषयाचा लेखी पेपर हा ५० गुणांचा असून विद्यापीठाच्या वतीने प्रश्नपत्रिका पुरवठा केल्या जातील व या विषयाची लेखी परीक्षा विद्यापीठातर्फे घेण्यात येईल.

३) **संगणकशास्त्र या विषयाची परीक्षा रविवार दिनांक ०२.०४.२०२३ रोजी सकाळी ९.०० ते १०.३० वाजेपर्यंत विद्यार्थी शिक्षण घेत असलेल्या महाविद्यालयातच (Home Centre) प्राचार्यांच्या नियंत्रण व मार्गदर्शनाखाली घेण्यात येणार आहे.**

४) सदर परीक्षेसाठी Multiple Choice Question Paper Cum- Answer Sheet च्या आवश्यक प्रती सर्व संबंधित महाविद्यालयांना विद्यापीठामार्फत पुरविण्यात येतील.

कृ.मा.पहा

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सदरील पेपरच्या प्रश्नपत्रिकेची (Multiple Choice Question Paper) उत्तरे (Answer Key) विद्यापीठाच्या www.bamu.ac.in/ किंवा bamua.digitaluniversity.ac/compulsory/Compulsory.aspx या वेबसाईटवर दिनांक ०७.०४.२०२३ रोजी उपलब्ध करण्यात येईल व ती पुढील आठ दिवसांपर्यंत वेबसाईटवर उपलब्ध असेल.

संगणकशास्त्र विषयाचा अभ्यासक्रम १०० गुणांचा असून परीक्षेमध्ये उत्तीर्ण होण्यासाठी लेखी व अंतर्गत परीक्षेच्या संपादित गुणांची बेरीज एकुण गुणांच्या कमीतकमी ५०% असणे आवश्यक आहे. परिपत्रक क्र ACAD/NP/COMP SCI/ENV SCI /2008 / 6587-6786 दिनांक 20.06.2008 चे अवलोकन करावे.

संबंधित महाविद्यालयामध्ये उत्तरपत्रिका तपासून झाल्यानंतर अंतर्गत आणि सदर लेखी परीक्षेचे गुण व त्यांची एकुण बेरीज गुणांच्या यादीमध्ये दर्शविण्यात यावी.

उत्तीर्ण झालेल्या विद्यार्थ्यांच्या संक्षेपितक्या प्रमाणपत्राच्या प्रती विद्यापीठाच्या परीक्षा विभागातील भांडार कक्षाकडून प्रत्यक्ष प्राप्त करुन घ्याव्यात. महाविद्यालयांनी सदर प्रमाणपत्रामध्ये संबंधित विद्यार्थ्यांचे नांव, एकुण प्राप्त गुण इत्यादी बाबींची नोंद करावी व त्याखर प्राचार्यांच्या स्वाक्षरी (स्वाक्षरीचा शिक्का नको) व महाविद्यालयाच्या शिक्क्यासह अशी प्रमाणपत्रे व मुळ गुणपत्रीका परीक्षा विभागातील संबंधित कक्षामध्ये जमा कराव्यात. त्यानंतर परीक्षा नियंत्रकांच्या सही शिक्क्यासह सदरील प्रमाणपत्रे विद्यार्थ्यांना वाटप करण्यासाठी संबंधित महाविद्यालयांना परत करण्यात येतील.

महाविद्यालयास पुरविण्यात आलेल्या प्रश्नपत्रिका-नि-उत्तरपत्रिका तसेच Field Note Books / Practical Books etc. पुढील आदेशापर्यंत महाविद्यालयामध्ये सुस्थितीत ठेवाव्यात. यथावकाश त्या विद्यापीठातर्फे जमा करण्यात येतील.

सदर परीक्षेची प्रमाणपत्रे संबंधित महाविद्यालयांनी विद्यार्थ्यांना वितरीत करावयाची असून आवश्यक तितकी प्रमाणपत्रे विद्यापीठातर्फे पुरविण्यात येतील. सदर प्रमाणपत्रे ही प्राचार्यांच्या सही व महाविद्यालयाच्या शिक्क्यासह संबंधित महाविद्यालयाने वितरीत करावयाची आहेत.

विद्यार्थ्यांनी सदरील प्रमाणपत्राची साक्षांकित प्रत तृतीय वर्षाच्या अंतिम वर्षाच्या परीक्षेसाठी दाखल करावयाच्या परीक्षा आवेदनपत्रासोबत सादर करावयाची असून विद्यार्थ्यांच्या अंतिम वर्ष परीक्षेचा निकाल त्याखेरीज घोषीत करण्यात येणार नाही.

सदरील परीक्षा ही ज्या त्या महाविद्यालयात (Home Center) होणार असल्यामुळे सर्व संबंधीत महाविद्यालयांनी QPDS ची माहिती भरावी त्या शिवाय प्रश्न पत्रिका डाऊनलोड करता येणार नाही व विद्यार्थी परीक्षेपासून वंचित राहू शकतात म्हणून कृपया QPDS ची माहिती सर्व संबंधीत महाविद्यलयांनी भरुन घ्यावी.

कृपया सदर परिपत्रक सर्व विद्यार्थी व संबंधित शिक्षक व प्रशासकिय कर्मचाऱ्यांच्या निदर्शनास आणावे व वरील निर्णयाची अंमलबजावणी काटेकोरपणे करुन विद्यापीठास सहकार्य करावे, ही विनंती.

Dr. Babasaheb Ambedkar Marathwada University Examinations Aurangabad

प्रा. डॉ. भारती गवळी
संचालक
परीक्षा व मूल्यमापन मंडळ

याची एक प्रत उपकुलसचिव, गोपनिय कक्ष यांचे सह सर्व विभागप्रमुख व कक्ष प्रमुख, परीक्षा विभाग डॉ. बाबासाहेब आंबेडकर मराठवाडा विद्यापीठ, औरंगाबाद यांना माहिती व योग्य त्या कार्यवाहीस्तव.

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Dr.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

CIRCULAR NO.SU/B.Sc./CBC&GS /69/2023

It is hereby inform to all concerned that, the syllabi prepared by the Board of Studies, Ad-hoc Boards and recommended by the Dean, Faculty of Science & Technology, the Hon'ble Vice-Chancellor has accepted the **following syllabi of Bachelor of Science with Practical Pattern of Question Paper under the scheme of Choice Based Credit & Grading System** in his emergency powers under section 12(7) of the Maharashtra Public Universities Act, 2016 on behalf of the Academic Council as appended herewith.

Sr.No.	Courses	Semester
1.	B.Sc. Biotechnology (Optional)	IIIrd & IVth semester
2.	B.Sc. Microbiology (Optional)	IIIrd & IVth semester
3.	B.Sc. Information Technology (Optional)	IIIrd & IVth semester
4.	Bachelor of Computer Application (Optional)	IIIrd & IVth semester
5.	B.Sc.Polymer Chemistry (Optional)	IIIrd & IVth semester
6.	B.Sc.Computer Science (Degree)	IIIrd & IVth semester
7.	Honors Degree of Computer Science	IIIrd & IVth semester
8.	Honors Degree of Biotechnology	IIIrd & IVth semester

This is effective from the Academic Year 2023-24 and onwards.

All concerned are requested to note the contents of this circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF.NO.SU/2023/ 1241-49
Date:- 12.06.2023.

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Deputy Registrar,
Academic Section

Copy forwarded with compliments to :-

1] **The Principal of all concerned Colleges,**
Dr. Babasaheb Ambedkar Marathwada University,

2] **The Director, University Network & Information Centre, UNIC, with a request to upload this Circular on University Website.**

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2] The Section Officer,[B.Sc.Unit] Examination Branch,Dr.BAMU,A'bad.
3] The Programmer [Computer Unit-1] Examinations, Dr.BAMU,A'bad.
4] The Programmer [Computer Unit-2] Examinations, Dr.BAMU,A'bad.
5] The In-charge,[E-Suvidha Kendra], Rajarshi Shahu Maharaj Pariksha Bhavan, Dr.BAMU,A'bad.
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Three Year Undergraduate Bachelor Degree Progr
In Science and Technology

B. Sc. (Computer Science)

Curriculum Structure and Scheme of Examination

Choice Based Credit System

(Effective from Academic Year 2022-23)

Dr. Babasaheb Ambedkar Marathwada Universit
Aurangabad – 431004 (MS) India

Dean
Faculty of Science & Technology
Dr. Babasaheb Ambedkar Marathwada
University, Aurangabad

B. Sc. Comp. Sci.

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SAGAR BCA COLLEGE
DEVMURTI, TQ. DIST. JALNA

Important Note Regarding Skill Enhancement Courses

1. Skill Enhancement Courses have a significant theoretical component therefore theory workload is assigned to the course but the teaching of these courses should focus on practical application, with the goal of developing practical skills and knowledge as the final outcome.
2. There shall be no theory examination for Skill Enhancement Courses (SEC-1, SEC-2).
3. The evaluation of Skill Enhancement Courses should be entirely based on college internal assessment, meaning that the assessment will be carried out by the college's respective course incharge, rather than by an external entity.
4. To assess the students' understanding and skills in Skill Enhancement Courses, they should demonstrate their acquired skill through hands-on experience, practical work, projects, and case studies. There should be one assessment for each unit and an additional assessment at the end of the semester.
5. Records of each assessment should be maintained by the college's respective course incharge and should be readily made available upon request.
6. At the end of the semester, the consolidated marks should be submitted to the University for Inclusion in the student's mark sheet, which will contribute towards their final grade.
7. The university should generate the mark list for Skill Enhancement Courses, similar to the internal assessment mark list. The mark list should be downloaded, filled with the consolidated marks of all assessments, and submit along with the internal marks list.

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Pattern of Question Paper (Theory)

B. Sc. (Computer Science) Semester - III and IV
Course Code ----------
Paper Number ----------
Title of Paper ----------

Time : 1.30 Hrs. Max Marks:

N.B.
1. Attempt All Questions.
2. All questions carry equal marks.
3. Illustrate your answer with suitable labelled diagram.

Q.1. Multiple choice questions / Fill In the Blanks / Terms / Definition / One Line Answer questions. (10 Ma

1)
2)
3)
4)
5)
6)
7)
8)
9)
10)

Q.2. Long answer question. (10 Marks
OR
Long Answer question

Q.3. Long answer question (10 Marks
OR
Short answer questions
a)
b)

Q.4. Short Notes on any TWO of the following:- (10 Marks)
a)
b)
c)
d)

Pattern of Question Paper(Practical)

B. Sc. (Computer Science) Semester - III and IV
Course Code ----------
Paper Number ----------
Title Of Paper ----------

Time: 3:00 Hrs. Max Marks : 100 (UA:80+IA:20)

N.B.
1. Attempt All Questions.
2. All questions carry equal marks.
3. Illustrate your answer with suitable labelled diagram

Section A

Q1 Experiment based on CS-313 P (25 Marks)

a) Question / Experiment– 35 Marks
b) Viva / Oral – 05 Marks
c) Internal Evaluation : 07 Marks
d) Record book : 03 Marks

Section B

Q2 Experiment based on CS-413 P (50 Marks)

e) Question / Experiment– 35 Marks
f) Viva / Oral – 05 Marks
g) Internal Evaluation : 07 Marks
h) Record book : 03 Marks

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Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

Choice Based Credit System (CBCS) Curriculum

For

Faculty of Science and Technology

Course Structure (Second Year)

B. Sc. (Computer Science) Three Year Under Graduate Degree Program

Second Year

Semester – III			Semester - IV		
Course Type	Name of Paper	Credit	Course Type	Name of Paper	Credit
Core Course VII (DSC-I C) Core Course (CC) 7 Credits	Object Oriented Programming Using C++	2	Core Course X (DSC-I D) Core Course (CC) 7 Credits	Core Java	2
	Relational Database Management System	2		Computer Graphics	2
	Lab Course	1.5		Lab Course	1.5
	Lab Course	1.5		Lab Course	1.5
Core Course VIII (DSC-II C) Core Course (CC) 7 Credits	Linux Operating System	2	Core Course XI (DSC-II D) Core Course (CC) 7 Credits	Basics of Android OS	2
	Advanced Data Structure	2		Computer Networks	2
	Lab Course	1.5		Lab Course	1.5
	Lab Course	1.5		Lab Course	1.5
Core Course IX (DSC-III C) Core Course (CC) 7 Credits	Computational Statistics Using R	2	Core Course XII (DSC-III D) Core Course (CC) 7 Credits	Data Analytics	2
	Web Fundamental	2		Open Source Web Application Development	2
	Lab Course	1.5		Lab Course	1.5
	Lab Course	1.5		Lab Course	1.5
Skill Enhancement Course (SEC-1) 01 Course, 2 credit each	SEC-1 (Any one of the skill to be chosen out of two) (A) - Office Automation (B) - Critical Thinking	2	Skill Enhancement Course (SEC-2) 01 Course, 2 credit each	SEC-2 (Any one of the skill to be chosen out of two) (C)- Basic Python Programming (D)- Emotional Intelligence	2
Ability Enhancement Compulsory Courses (AECC), 02 Course, 3 credit each)	Communication Skill in English-III	3	Ability Enhancement Compulsory Courses (AECC), 02 Course 3, credit each)	Communication Skill in English-IV	3
	Marathi/Hindi/Sanskrit/Urdu/Arabic - (SL-III) A student can opt for one of these languages	3		Marathi/Hindi/Urdu/Arabic (SL-IV) A Student can opt for of these languages	3
Non-Credit Course	-----	----	Non-Credit Course	Environment Studies	--
Total Credit		29			29

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Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

Choice Based Credit System (CBCS) Curriculum
For
Faculty of Science and Technology
Course Structure and Scheme of Examination (Second Year)
B. Sc. (Computer Science) Three Year Under Graduate Degree Program

Semester-III

Course Type	Course Code	Course Title	Total Periods (Teaching Periods / Week)	Credits	Scheme of Examination			
					UA	IA	Max Marks	Min Marks
Core Course VII (DSC-I C) Core Course (CC)	CS-311T	Object Oriented Programming Using C++	45 (3/per week)	2	40	10	50	20
	CS-312T	Relational Database Management System	45 (3/per week)	2	40	10	50	20
	CS-313P	Lab Course (based on CS-311T)	45 (3/per week)	1.5	40	10	50	20
	CS-314P	Lab Course (based on CS-312T)	45 (3/per week)	1.5	40	10	50	20
Core Course VIII (DSC-II C) Core Course (CC)	CS-321T	Linux Operating System	45 (3/per week)	2	40	10	50	20
	CS-322T	Advanced Data Structure	45 (3/per week)	2	40	10	50	20
	CS-323P	Lab Course (based on CS-321T)	45 (3/per week)	1.5	40	10	50	20
	CS-324P	Lab Course (CS-322T)	45 (3/per week)	1.5	40	10	50	20
Core Course IX (DSC-III C) Core Course (CC)	CS-331T	Computational Statistics Using R	45 (3/per week)	2	40	10	50	20
	CS-332T	Web Fundamental	45 (3/per week)	2	40	10	50	20
	CS-333P	Lab Course (based on CS-331T)	45 (3/per week)	1.5	40	10	50	20
	CS-334P	Lab Course (based on CS-332T)	45 (3/per week)	1.5	40	10	50	20
Skill Enhancement Course (SEC-1)**	CS-341	SEC-I (Any one of the skill to be chosen out of two) (A) - Office Automation (B) – Critical Thinking	45 (3/per week)	2	-	50	50	20
Ability Enhancement Compulsory Courses (AECC-3)	CS-351T	Communication Skill in English-III	45 (3/per week)	3	40	10	50	20
	CS-361T	Marathi/Hindi/Sanskrit/Urdu/Arabic - (SL-III) A student can opt for one of these languages	45 (3/per week)	3	40	10	50	20
Non Credit Course								
		45 Period Per week		**29**	**560**	**190**	**750**	**300**

*DCS – discipline Specific core courses

Total Credit for Semester III : 29 (Theory : 20 : Laboratory : 9)

****Refer Important note on Page 2 Related to Skill Enhancement Course Assessment**

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Choice Based Credit System (CBCS) Curriculum

For

Faculty of Science and Technology

Course Structure and Scheme of Examination (Second Year)

B. Sc. (Computer Science) Three Year Under Graduate Degree Program

Semester-IV

Course Type	Course Code	Course Title	Total Periods (Teaching Periods / Week)	Credits	Scheme of Examination			
					UA	IA	Max Marks	Min Marks
Core Course X (DSC-I D) Core Course (CC)	CS-411T	Core Java	45 (3/per week)	2	40	10	50	20
	CS-412T	Computer Graphics	45 (3/per week)	2	40	10	50	20
	CS-413P	Lab Course (based on CS-411T)	45 (3/per week)	1.5	40	10	50	20
	CS-414P	Lab Course (based on CS-412T)	45 (3/per week)	1.5	40	10	50	20
Core Course XI (DSC-II D) Core Course (CC)	CS-421T	Basics of Android OS	45 (3/per week)	2	40	10	50	20
	CS-422T	Computer Networks	45 (3/per week)	2	40	10	50	20
	CS-423P	Lab Course (based on CS-421T)	45 (3/per week)	1.5	40	10	50	20
	CS-424P	Lab Course (CS-422T)	45 (3/per week)	1.5	40	10	50	20
Core Course XII (DSC-III D) Core Course (CC)	CS-431T	Data Analytics	45 (3/per week)	2	40	10	50	20
	CS-432T	Open Source Web Application Development	45 (3/per week)	2	40	10	50	20
	CS-433P	Lab Course (based on CS-431T)	45 (3/per week)	1.5	40	10	50	20
	CS-434P	Lab Course (based on CS-432T)	45 (3/per week)	1.5	40	10	50	20
Skill Enhancement Course (SEC-2)**	CS-441	SEC-2 (Any one of the skill to be chosen out of two) (C) - Basic Python Programming (D) – Emotional Intelligence	45 (3/per week)	2	-	50	50	20
Ability Enhancement Compulsory Courses (AECC-4)	CS-451T	Communication Skill in English-IV	45 (3/per week)	3	40	10	50	20
	CS-461T	Marathi/Hindi/Sanskrit/Urdu/Arabic - (SL-IV) A student can opt for one of these languages	45 (3/per week)	3	40	10	50	20
Non Credit Course	CS-471T	Environment Studies	45 (3/per week)					
		48 Period Per week		29	560	190	750	300

Total Credit for Semester IV : 29 (Theory : 20 : Laboratory : 9)

*DCS – discipline Specific core courses

**Refer Important Web Link Page 2 Related to Skill Enhancement Course Assessment

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B. Sc. Comp Sci.

B. Sc. (Computer Science)

Semester - III

Curriculum for semester III

Course Code: CS-311T	Course Title:- Object Oriented Programming Using C++
Total Credit: 2	Marks: 50 (UA: 40 + IA: 10)

Periods: 3 per week (50 Minutes each)

Prerequisites:
1. Basic Programming Language Construct (Like looping and decision making) using C
2. Functions and Structures in C

Learning Objectives
1. Understand principles of OOP Using C++.
2. Design and implement OOP programs using C++.
3. Understand classes, objects, inheritance, and polymorphism using C++.
4. Develop Object Oriented Programming skills and gain practical experience.

Learning Outcomes
After Completion of the Course students will be able to
1. Apply OOP principles to design efficient and scalable programs..
2. Use C++ features to create complex and extensible programs.
3. Develop generic and reusable code using Polymorphism.

Unit -I: Introduction to C++ (10 Periods)
Input- output in C++, Data Types C++, and drive data types. The void data type, Type Modifiers, Typecasting, and Constant in C++, Operators in C++, Precedence of Operators, and Strings.

Unit -II: Structures and Functions in C++ (10 Periods)
Parts of Function, User- defined Functions, Value- Returning Functions, void Functions, Value Parameters, Function overloading, Virtual Functions. Structure in C++.

Unit -III: Introduction to Oops using C++ (10 Periods)
Object Oriented Technology, Advantages of OOP. Class, Build- in Operations on Classes, Assignment Operator and Classes, Class Scope, Reference parameters and Class Objects (Variables), Member functions, Accessor and Mutator Functions, Constructors, default Constructor, Destructors.

Unit -IV: Overloading, Templates and Inheritance (10 Periods)
Operator Overloading, Function Overloading, Function Templates, Class Templates. Single and Multiple Inheritance, virtual Base class, Abstract Class, Pointer and Inheritance, Overloading Member Function. Friend Function.

Unit-V: Test and Tutorials (05 Periods)
In addition to CIA, Tutorial, Seminars, Assignments & case studies are to be given for building proficiency in the course. (Respective course in-charge should maintain the records for the same).

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Textbook

1. Object Oriented Programming with C++, 3/e by E. Balaguruswamy, Tata McGraw Hill.
2. Starting Out with Object Oriented Programming in C++, by Tony Gaddis, Wiley India.

References:

1. Mastering C++, 1/e by Venugopal, Tata McGraw Hill.
2. The C++ Programming language 3/e by Bjarne Stroustrup, Pearson Education.
3. C++, How to Programme, 4e, by Deitel, Pearson Education.
4. Big C++ by Cay Horstmann, Wiley India.

E-Resources

1. Cplusplus.com: A comprehensive online resource for learning C++ programming, including tutorials, code examples, and a reference guide.
   https://cplusplus.com/
2. Codecademy: An online learning platform that offers an interactive C++ course that covers OOP concepts.
   https://www.codecademy.com/resources/docs/cpp

Course Code: CS-312T	**Course Title:- Relational Database Management System**
Total Credit: 2	Marks: 50 (UA: 40 + IA: 10)
Periods: 3 per week (50 Minutes each)	

Prerequisites:
Database Management System Concepts from Course CS-216T

Learning Objectives

1. Understand the basic concepts of Relational Database Management System (RDBMS).
2. Learn to design and create a relational database schema using SQL.
3. Explore the functionalities of RDBMS and learn to implement them for data manipulation and retrieval.
4. Understand the concepts of normalization and apply them to eliminate data redundancy and improve data integrity.

Learning Outcomes
After Completion of the Course students will be able to

1. Design and create a relational database schema using SQL.
2. Implement various RDBMS functionalities such as data insertion, deletion, modification, and retrieval.
3. Demonstrate the ability to use SQL to write complex queries for data analysis and reporting.
4. Understand the principles of database normalization and apply them to ensure data integrity and optimize database performance.

Unit -I: (10 Periods)
Relational Model: CODD's Rule- Relational Data Model - Key - Integrity – Relational Algebra Operations

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Advantages and limitations – Relational Calculus – Domain Relational Calculus -QBE.
Unit -II: (10 Periods) Structure of Relational Database. Introduction to Relational Database Design - Objectives – Tools - Redundancy and Data Anomaly – Functional Dependency - Normalization – 1NF – 2NF – 3NF –BCNF. Transaction Processing – Database Security.
Unit -III: (10 Periods) SQL: Commands – Data types – DDL - Selection, Projection, Join and Set Operations – Aggregate Functions – DML – Modification - Truncation - Constraints – Subquery.
Unit -IV: (10 Periods) PL/SQL: Structure - Elements – Operators Precedence – Control Structure – Iterative Control -Cursors - Procedure - Function - Packages – Exceptional Handling - Triggers.
Unit-V: Test and Tutorials (05 Periods) In addition to CIA, Tutorial, Seminars, Assignments & case studies are to be given for building proficiency in the course. (Respective course in-charge should maintain the records for the same).

Textbook

1. S. Sumathi, S. Esakkirajan, "Fundamentals of Relational Database Management System", Springer International Edition 2007.

References:

1. Abraham Silberchatz, Henry F. Korth, S. Sudarshan, "Database System Concepts", McGrawHill 2019, 7th Edition.
2. Alexis Leon & Mathews Leon, "Fundamentals of DBMS", Vijay Nicole Publications 2014, 2nd Edition.

E-Resources

1. SQLBolt (https://sqlbolt.com/): This is a free interactive tutorial that teaches SQL commands using simple exercises and examples.
2. W3Schools SQL (https://www.w3schools.com/sql/): This is a comprehensive and free online resource for learning SQL and database management.

Course Code: CS-313P	**Course Title: Lab Course (based on CS-311T)**
Total Credit: 1.5	Marks: 50 (UA: 40 + IA: 10)
Periods: 3 per week (50 Minutes each)	

Sample List of experiments to be carried out based on the course **CS-311T**

(The teacher can add three practical examples based on each unit as per their choice and feasibility)

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1. Write a C++ program to implement basic data types and operators.
2. Write a C++ program to implement control structures like loops and conditional statements.
3. Write a C++ program to implement a calculator using basic arithmetic operators and control structures.
4. Write a C++ program to implement functions and function overloading.
5. Write a C++ program to demonstrate implementation of structures in C++.
6. Write a C++ program to implement a function that converts a string to uppercase using string functions.
7. Write a C++ program to implement a function that converts a string to uppercase using pointers and arrays.
8. Write a C++ program to implement a class that represents a number with functions for addition, subtraction, multiplication, and division. (Operator overloading)
9. Write a C++ program to implement a class that represents a book with functions for adding, deleting books in a library system. (Introduction to classes and objects)
10. Write a C++ program to implement a class that represents a bank account with functions for deposit, withdraw, and balance check. (Basics of class and object creation)
11. Write a C++ program to implement a class that represents a date with functions for setting and getting the date and calculating the difference between two dates. (Function overloading)
12. Write a C++ program to implement a class hierarchy that includes a base class called "Vehicle" and two derived classes called "Car" and "Motorcycle" with functions for displaying their respective features. (Inheritance and polymorphism)
13. Write a C++ program to implement a class hierarchy that includes a base class called "Shape" and two derived classes called "Circle" and "Rectangle" with functions for calculating their respective areas and perimeters. (Inheritance and polymorphism)
14. Write a C++ program to implement a class that represents a date with functions for setting and getting the date and calculating the difference between two dates. (Function overloading)
15. Write a C++ program to implement the concept of friend function.

Course Code: CS-314P	**Course Title: Lab Course (based on CS-312T)**
Total Credit: 1.5	Marks: 50 (UA: 40 + IA: 10)
Periods: 3 per week (50 Minutes each)	

Sample List of experiments to be carried out based on the course **CS-312T**

(The teacher can make use of MySQL or Oracle for laboratory practice and add three practical examples based on each unit as per their choice and feasibility)

1. Create a database and tables using SQL commands
2. Insert data into tables using SQL queries
3. Update existing data in tables using SQL queries
4. Delete data from tables using SQL queries
5. Use SELECT statement to retrieve data from tables
6. Use WHERE clause to filter data in SELECT statements
7. Use GROUP BY and HAVING clauses to aggregate data in SELECT statements
8. Join multiple tables using INNER JOIN and OUTER JOIN
9. Use subqueries to retrieve data from multiple tables
10. Create views to simplify complex SQL queries
11. Create indexes to improve query performance
12. Use data normalization techniques to design and create efficient database schemas
13. Implement foreign keys and referential integrity constraints in database schemas

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Use transactions to ensure data consistency and atomicity in database operations
Backup and restore databases using SQL commands and tools

Course Code: CS-321T	Course Title:- Linux Operating Systems
Total Credit: 2	Marks: 50 (UA: 40 + IA: 10)

Periods: 3 per week (50 Minutes each)

Prerequisites:
Operating System I & II Courses (CS-113T & CS-213T)

Learning Objectives

1. To learn basics of Linux Operating System, its components, features and flavors
2. To learn basic and common Linux commands
3. To learn to set ownership and permissions of the files and directories
4. To learn to manipulate files/directories.
5. To learn working in Vi Editor

Learning Outcomes
After Completion of the Course students will be able to

1. Understand the various features and distributions of Linux OS.
2. Ability to execute basic Linux commands.
3. Ability to set ownership and permissions for files/directories.
4. Ability to use the Vi Editor.

Unit -I: History and Development of Linux (10 Periods)
A Brief History of Linux, Basic features of Linux OS, components of Linux System, Benefits of Linux, Acquiring and Using Linux, Examining Linux Distributions, Installation notes, Linux Loader, Linux kernel, Linux file system.

Unit -II: System Access & User Accounts (10 Periods)
System Access and User Accounts -Logging In and out Using the Linux System, Creating Additional User Accounts, Creating & Managing Groups, and Managing Users Linux Commands.

Unit -III: File System & File Permissions (10 Periods)
Introduction to The File System and Working with Linux Permissions , File System Navigation, Managing The File System Understanding Permissions, Changing File And Directory Permissions, Changing Default Permissions And Ownership

Unit -IV: Using Editors (10 Periods)
Using The Vi Editor, Studying Other Editors, Redirection, and Introduction to Programming In C Using Linux (gcc).

Unit-V: Test and Tutorials (05 Periods)
In addition to CIA, Tutorial, Seminars, Assignments & case studies are to be given for building proficiency in the course. (Respective course in-charge should maintain the records for the same).

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Textbook

1. Linux for Beginners: The Ultimate Guide To The Linux Operating System & Linux Commands 1st Edition By Adam Vardy.
2. LINUX: The Ultimate Step by Step Guide to Quickly and Easily Learning Linux by TED DAWSON

References:

1. McAllister, S, Use Linus-10, Pearson Education, 2006 ISBN-81-7808-488-0 PHI.
2. Ball, Using Linux, PHI, 1998. ISBN-10: 0789716232
3. Das, UNIX: Concepts and Applications (4th Ed), TMH, 2006 ISBN 13: 9780070635463,
4. Foster Johnson, Welch, Anderson, Beginning Shell Scripting, Wiley India (Wrox), 2006 ISBN- 10: 0764583204
5. Neil Mathew, Richard Stones, Beginning Linux Programming (3rd Ed), Wiley India (Wrox), 2006 ISBN: 978-0-470-14762-7
6. Peterson, Linux: Complete Reference (5th Ed), Peterson, TMH. ISBN 10: 0070222940

E-Resources

1. Linux Journey - https://linuxjourney.com/ - It is a free interactive online tutorial that covers all the basics of Linux with a series of short lessons.
2. edX Linux Course - https://www.edx.org/learn/linux - edX offers a free online course on Linux that covers the fundamentals of Linux, the command-line interface, and basic scripting.
3. Linux Tutorial - https://www.tutorialspoint.com/unix_commands/index.htm - This is a comprehensive tutorial that covers all the basic concepts of Linux, including command-line interface, file management, and shell scripting.

Course Code: CS-322T	Course Title:- Advance Data Structure
Total Credit: 2	Marks: 50 (UA: 40 + IA: 10)
Periods: 3 per week (50 Minutes each)	

Prerequisites:

Data Structure Courses (CS-211T)

Learning Objectives

1. To provide knowledge linked list, its types and its in computer memory.
2. To familiarize with non-linear data structures.
3. To provide knowledge on how advance data structures are implemented and processed.
4. To equip with the implementation techniques of complex algorithms of insertion, deletion and modification of data stored in advance data structures.
5. To provide knowledge of the functioning of dynamic data structures like heaps binary search trees.

Learning Outcomes

After Completion of the Course students will be able to

1. Understand linked-lists and non-linear data structures like trees and graphs.

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2. Program Linked list and non-linear data structure's implementation in memory.
3. Select appropriate data structures and algorithms for problems and to justify their choice.
4. Understand advance algorithms like heaps, Kruskal's Algorithm, and Prim's Algorithm.

Unit -I: Linked List (10 Periods)
Drawbacks of Arrays, Introduction to Linked lists, Types of Linked Lists, Representation of Linked List in Memory, Operations on Singly Linked Lists (Traversing, Insertion, Deletion and modification), Doubly Linked List, Representation of Doubly Linked List in Memory, Operations on doubly Linked Lists (Traversing, Insertion, Deletion and modification).

Unit -II: Trees (10 Periods)
Introduction and key terminology, Binary Trees Binary Tree Creation and Traversal Using Arrays, Binary Tree Creation and Traversal Using Pointers, Expression Trees, traversing binary tree recursively and non-recursively (pre-order, in order, post order traversal), Application of trees (binary search tree).

Unit -III: Graphs(10 Periods)
Introduction and key terminology, graph representation in memory (static and dynamic), traversing a graph (breath first search, depth first search), spanning tree, Kruskal's Algorithm, Prim's Algorithm

Unit -IV: Advance Trees (10 Periods)
Heaps, Min/ Max Heap, Binomial Heap, Fibonacci Heap, Heap Sort, B Tree, B+ Tree.

Unit-V: Test and Tutorials (05Periods)
In addition to CIA, Tutorial, Seminars, Assignments & case studies are to be given for building proficiency in the course. (Respective course in-charge should maintain the records for the same).

Textbook

1. Data Structures using C, by Seema Threja, 2nd Edition, Oxford Press.
2. Lipschutz: Schaum's outline series Data structures Tata McGraw-Hill

References:

1. Fundamentals of Data Structures in C, by Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed
2. Design & Analysis of computer Algorithms by Alfred Aho, John Hopcroft and Jeffery Ullman
3. Introduction to Algorithms by Thomas Corman et.al

E-Resources

1. Coursera: Data Structures and Algorithms Specialization Link: https://www.coursera.org/specializations/data-structures-algorithms This is a series of courses offered by the University of California San Diego on Coursera. It covers topics like algorithmic analysis, graph algorithms, data structures and dynamic programming.
2. Data Structures and Algorithms in C++ by Adam Drozdek Link: https://www.pdfdrive.com/data-structures-and-algorithms-in-c-e16544168.html This is a free ebook that covers data structures and algorithms using C++. It includes topics like arrays, linked lists, stacks, queues, trees, sorting and searching algorithms, and graph algorithms.

Course Code: CS-323P	Course Title: Lab Course (based on CS-321T)

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Total Credit: 1.5	Marks: 50 (UA: 40 + IA: 10)
Periods: 3 per week (50 Minutes each)	

Sample List of experiments to be carried out based on the course **CS-321T**

(The teacher can make use of any flavour of Linux distribution and add few more practical based on each unit)

1. Access: Logging In, Linux Commands, Getting Help, Obtaining Information about Your System.
2. Starting and Stopping Linux: Shutting Down a Linux System, Booting a Linux System.
3. Demonstration of Linux commands with attributes: - pwd, cd, ls, more, less, echo, clear, kill, ps, man, cal, date, who, who am I, WC, mkdir, rmdir, rm, sort.
4. File and File Permission: Creation of Files, and changing their permission (Cat,vi, Chmod)
5. Archiving Files: Archiving Files with tar
6. Write a shell script to display first 20 terms of Fibonacci series.
7. Write a shell script to display current time of system and display the message according to the time.
8. Write a shell script to check the user is login or not and say hello.
9. Write a shell script to calculate factorial of a number
10. Using filters & redirections: create new processed files (Using Head, tail, cut, paste etc. create resultsheet/salarysheet)
11. Develop a C Program In Linux to find out 20 terms of Fibonacci series.
12. Develop a C Program In Linux to calculate factorial of a number

Course Code: CS-324P	**Course Title: Lab Course (based on CS-322T)**
Total Credit: 1.5	Marks: 50 (UA: 40 + IA: 10)
Periods: 3 per week (50 Minutes each)	

Sample List of experiments to be carried out based on the course **CS-322T**

(The teacher can make use of any language to implement these programs but are suggested to use either C or C++. Also teacher can add few more practical based on each unit)

Practical No	Details
	Implement Singly Linked List
1	Write a program to create a singly linked, add few nodes, and display the same.
2	Write a program to create a singly linked, add new node at the beginning of the linked list, and display list before and after adding new node.
3	Write a program to create a singly linked, add new node at the end of the linked list, and display list before and after adding new node.
4	Write a program to create a singly linked, delete node at the beginning of the linked list, and display list before and after deletion.
5	Write a program to create a singly linked, delete the last node of the linked list, and display list before and after deletion.

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6	Write a program to create a singly linked, add few nodes, modify node at a specific location, and display the list before and after modification.
	Implement Doubly Linked List
7	Write a program to create a doubly linked, add few nodes, and display the same.
8	Write a program to create a doubly linked, add new node at the beginning of the linked list, and display list before and after adding new node.
9	Write a program to create a doubly linked, add new node at the end of the linked list, and display list before and after adding new node.
10	Write a program to create a doubly linked, delete node at the beginning of the linked list, and display list before and after deletion.
11	Write a program to create a doubly linked, delete the last node of the linked list, and display list before and after deletion.
12	Write a program to create a doubly linked, add few nodes, modify node at a specific location, and display the list before and after modification.
	Implement Trees
13	Write a program to create a binary tree of degree 3, display each node.
14	Write a program to create a binary tree of degree 3, and search an element in the tree.
	Implement Graphs:
15	Write a program to implement the concept of breath first search.
16	Write a program to implement the concept of depth first search.
	Implement Advance Trees:
17	Write a program to create a heap tree
18	Write a program to demonstrate the Prim's algorithm

Course Code: CS-331T	**Course Title:- Computational Statistics Using R**
Total Credit: 2	Marks: 50 (UA: 40 + IA: 10)
Periods: 3 per week (50 Minutes each)	

Prerequisites:

Programming language basics.

Learning Objectives

1. To introduce students to the fundamentals of statistics and their applications in various fields.
2. To develop proficiency in using the R programming language for data analysis and visualization.
3. To teach students essential statistical techniques, including descriptive statistics, inferential statistics, and regression analysis.
4. To enable students to apply statistical methods to real-world datasets and interpret the results.

Learning Outcomes

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

1. Understand the core concepts and methods in statistics, and recognize their importance in various

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disciplines.
2. Effectively use the R programming language to manage, analyze, and visualize data.
3. Apply appropriate statistical techniques, such as hypothesis testing and regression analysis, to answer research questions and make data-driven decisions.
4. Analyze real-world datasets using statistical methods and R, interpret the results, and communicate their findings to both technical and non-technical audiences.

Unit -I: Introduction to Statistics and R Language (10 Period)

1. **Importance of Statistics in Various Fields** (01 Period)**:** Definition and purpose of statistics, Applications of statistics in different fields, such as: Business and economics (e.g., market research, financial analysis), Healthcare (e.g., clinical trials, epidemiology), Social sciences (e.g., psychology, sociology, political science), Natural sciences (e.g., physics, chemistry, biology), Engineering (e.g., quality control, reliability engineering).

2. **Introduction to R Programming Language and R-Studio** (05 Period)**: Overview of R and its advantages:** Installing R and R-Studio, Navigating the R-Studio interface (console, script editor, environment, plots, and help), R packages and CRAN repository, Basic R Syntax, Data Types, and Operations, R syntax and expressions, Data types: numeric, character, logical, factor, and date/time, **Data structures**: vector, matrix, list, and data frame, Basic R operations: arithmetic, relational, and logical, **Control structures**: if-else, for loops, and while loops, Functions: built-in and user-defined.

3. **Measures of Central Tendency (Mean, Median, Mode)** (02 Period)**:** Definition and properties of mean, median, and mode. Calculation of mean, median, and mode using R functions: mean, median, and mode, **Measures of Dispersion (Range, Variance, Standard Deviation)**: Definition and properties of range, variance, and standard deviation, Calculation of range, variance, and standard deviation using R functions: range, var, and sd.

4. **Introduction to Data Visualization** (02 Period)**:** Importance of data visualization, Types of data visualizations (e.g., bar chart, pie chart, line chart, scatter plot, histogram, box plot), Basic principles of good data visualization.

Unit -II: Probability and Data Distributions (10 Periods)

1. **Basics of Probability Theory**: Definition of probability and its properties, Sample space, events, and outcomes, Basic rules of probability: addition rule, multiplication rule, and conditional probability, Independent and dependent events, Bayes' theorem

2. **Discrete Probability Distributions**: Introduction to discrete probability distributions, Probability mass function (PMF), Expected value and variance of discrete random variables, Binomial distribution: definition, properties, and applications, R functions: dbinom, pbinom, qbinom, rbinom, Poisson distribution: definition, properties, and applications, R functions: dpois, ppois, qpois, rpois.

3. **Continuous Probability Distributions**: Introduction to continuous probability distributions, Probability density function (PDF) and cumulative distribution function (CDF), Expected value and variance of continuous random variables, Normal distribution: definition, properties, and applications, R functions: dnorm, pnorm, qnorm, rnorm, Exponential distribution: definition, properties, and applications, R functions: dexp, pexp, qexp, rexp

4. **Working with Probability Distributions in R**: Generating random samples from discrete and continuous distributions, Estimating distribution parameters from data, Computing probabilities and percentiles using R functions, Visualizing probability distributions: histograms, density plots, and empirical CDFs, Fitting probability distributions to data using R packages like fitdistrplus

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Unit -III: Basic Inferential Statistics: (10 Periods)

1. **Sampling and Sampling Distributions**: Definition and importance of sampling, Types of sampling methods (e.g., simple random sampling, stratified sampling, cluster sampling), Sampling distribution and its properties, Central Limit Theorem and its implications, Standard error of the mean and its calculation using R: sd and length functions.
2. **Confidence Intervals**: Definition and purpose of confidence intervals, Interpretation of confidence intervals, Calculation of confidence intervals for population mean (using t-distribution): t functions: t.test, qt, and manual calculation, Calculation of confidence intervals for population proportion, R functions: prop.test and manual calculation
3. **Hypothesis Testing**: t-test and chi-square test: Definition and purpose of hypothesis testing, Null hypothesis and alternative hypothesis, Type I and Type II errors, significance level, and power, One-sample t-test, two-sample t-test, and paired t-test, R functions: t.test, Chi-square test for goodness-of-fit and independence, R functions: chisq.test
4. **Introduction to Linear Regression**: Definition and purpose of linear regression, Simple linear regression model: assumptions and parameters, Estimation of parameters using the least-squares method, Interpretation of the regression coefficients and the coefficient of determination (R-squared), R functions for linear regression: lm, summary, confint, predict, and plot

Unit -IV: Data Analysis and Visualization using R (10 Periods)

1. **Data Visualization Techniques in R: Histograms:** visualizing the distribution of a continuous variable, R functions: hist, **Box plots:** displaying the five-number summary of a continuous variable, R functions: boxplot, **Scatter plots:** visualizing the relationship between two continuous variables, R functions: plot, **Bar charts:** representing the frequency or proportion of categorical variables, R functions: barplot, table
2. **Analysing Real-World Datasets and Case Studies**
   - Choosing appropriate datasets for practice and analysis (e.g., from sources like Kaggle, UCI Machine Learning Repository, or government websites)
   - Steps for analysing real-world datasets:
     1. **Data exploration and pre-processing:** handling missing values, outliers, and data transformations
     2. **Descriptive statistics:** calculating measures of central tendency, dispersion, and visualizing the data
     3. **Inferential statistics:** applying hypothesis testing and regression analysis to answer research questions
     4. **Interpretation and communication of results**

Encourage students to work on real-world case studies related to their interests or field of study

Unit-V: Test and Tutorials (05 Periods)

In addition to CIA, Tutorial, Seminars, Assignments & case studies are to be given for building proficiency in the course. (Respective course in-charge should maintain the records for the same).

Textbook

1. "Introductory Statistics with R" by Peter Dalgaard (Springer, 2nd Edition, 2008)
2. "Discovering Statistics Using R" by Andy Field, Jeremy Miles, and Zoë Field (SAGE Publications, 2012)

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References:

1. "Statistics for Business and Economics" by Paul Newbold, William Carlson, and Betty Thorne.
2. "Probability and Statistics for Engineers and Scientists" by Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, and Keying Ye.
3. "Introduction to Probability and Statistics" by William Mendenhall, Robert J. Beaver, and Barbara M. Beaver.

E-Resources

1. "R Programming for Data Science" by Roger D. Peng
   - Download: https://bookdown.org/rdpeng/rprogdatascience/
   - This book focuses on R programming, providing a solid foundation for students interested in learning R for data science and statistical analysis.
2. "An Introduction to Statistical Learning with Applications in R" by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani
   - Download: https://www.statlearning.com/
   - This book covers various statistical learning methods, including linear regression, classification, and clustering, with a focus on applications in R.
3. "The Art of R Programming" by Norman Matloff
   - Download: https://www.nostarch.com/artofr.htm (Sample PDF available)
   - This book covers the fundamentals of R programming, data structures, and functions. While not strictly focused on statistics, it provides a strong foundation in R programming for statistical analysis.
4. "R for Data Science" by Hadley Wickham and Garrett Grolemund
   - Download: https://r4ds.had.co.nz/ (PDF available via the link "Get the book" on the top-right corner)

Course Code: CS-332T	Course Title:- Web Fundamentals
Total Credit: 2	Marks: 50 (UA: 40 + IA: 10)
Periods: 3 per week (50 Minutes each)	

Prerequisites:

There are no prerequisites for this course

Learning Objectives

1. Understand the basic concepts and principles of web technologies, including HTML, CSS, and JavaScript.
2. Gain practical skills in creating responsive and accessible web designs.
3. Learn how to validate web pages and follow web standards set by the W3C.
4. Develop proficiency in manipulating the Document Object Model (DOM) using JavaScript.

Learning Outcomes

After Completion of the Course students will be able to

1. Develop functional and visually appealing web pages using HTML and CSS.
2. Design responsive web layouts that adapt to different devices and screen sizes.

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4. Implement client-side scripts using JavaScript to add interactivity and dynamic behavior to web pages.
5. Validate and optimize web pages for accessibility, performance, and compliance with web standards.

Unit -I: Introduction (10 Periods)

1. **Web Browsers:** Introduction to web browsers, types of web browsers, how they work.
2. **Web Servers:** Introduction to web servers, types of web servers, how they work.
3. **Client-side vs. Server-side:** Understanding the difference between client-side and server-side processing.
4. **Web Standards:** Introduction to web standards, W3C, HTML validation, CSS validation.
5. **HTML Syntax and Basic Tags:** study the basic syntax of an HTML document, including the doctype declaration, opening and closing tags, and nesting of elements. We will also explore fundamental HTML tags like <head>, <body>, <h1>-<h6>, <p>, <a>, and <img>.
6. **Structure of an HTML Document:** delve into the standard structure of an HTML document, including the <!DOCTYPE> declaration, the <html> element, and the <head> and <body> sections. We will also learn how to use comments and the proper organization of elements within the document.
7. **HTML Elements and Attributes:** learn about the different types of HTML elements, including block-level and inline elements. We will cover how to use attributes to provide additional information about an element, such as the 'src' attribute for images or the 'href' attribute for links.
8. **Semantic HTML:** explore the importance of using semantic elements in HTML5, such as <article>, <section>, <header>, <nav>, and <footer>, and how these elements can enhance the accessibility and search engine optimization of web pages.
9. **HTML5:** study the new features and improvements introduced in HTML5, including multimedia elements like <video> and <audio>, new form input types and attributes, and JavaScript APIs for advanced functionality.
10. **Lists:** learn how to create ordered and unordered lists using the <ol> and <ul> elements.
11. **Links and Navigation:** study how to create different types of links using the <a> element, including internal, external, and anchor links, as well as email and telephone links.

Unit -II: CSS Fundamentals (10 Periods)

1. **Introduction to CSS**
   - Understanding the purpose of CSS
   - Syntax and structure of CSS rules
   - Applying CSS: inline, internal, and external stylesheets
   - Linking a CSS file to an HTML document using the **<link>** element
2. **Basic Selectors**
   - Element, class, and ID selectors
   - Universal and attribute selectors
   - Grouping and chaining selectors
   - Understanding selector specificity
3. **Advanced Selectors and Combinators**
   - Descendant, child, and sibling combinators
   - Pseudo-classes: **:hover**, **:active**, **:visited**, **:first-child**, **:last-child**, and **:nth-child**
   - Pseudo-elements: **::before**, **::after**, and **::first-letter**
   - Attribute selectors with various matching patterns
4. **Box Model: Basics**
   - Understanding the CSS box model (content, padding, border, margin)
   - Setting width and height of elements
   - Managing overflow and scrollbars
5. **Box Model: Padding, Margin, and Border**
   - Setting padding, margin, and border properties
   - Using shorthand notation for padding, margin, and border

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box-sizing property and its values (content-box, border-box)

6. **Layout and Positioning: Display Property**
   Understanding the **display** property (block, inline, inline-block)
   Using the **display** property to create layouts
   Controlling element visibility with **display: none** and **visibility: hidden**
7. **Layout and Positioning: Floats and Positioning**
   Creating multi-column layouts with **float**
   Clearing floats with the **clear** property
   Static, relative, absolute, and fixed positioning
8. **Layout and Positioning: Flexbox**
   Introduction to the CSS Flexbox layout system
   Defining a flex container and flex items
   Controlling the direction, alignment, and order of flex items
   Handling flexible sizes and growing/shrinking of items
9. **Layout and Positioning: CSS Grid**
   Introduction to the CSS Grid layout system
   Defining a grid container and grid items
   Setting up grid columns, rows, and gaps
   Positioning grid items and controlling their size
10. **Review and Best Practices**
    Review of key concepts covered in the course
    Organizing and structuring CSS code
    CSS naming conventions and methodologies (e.g., BEM)
    Tips for writing maintainable and efficient CSS

Unit -III: Advanced HTML and CSS Techniques (10 Periods)

1. Advanced HTML: Tables, forms, multimedia, accessibility, SEO.
2. Responsive Web Design: Understanding responsive design principles, media queries, fluid grids, responsive images.
3. CSS3: Advanced CSS3 techniques, transitions, animations, transforms, and gradients.

Unit -IV: JavaScript Fundamentals (10 Periods)

1. Introduction to JavaScript: Basic concepts, syntax, and usage.
2. Control Structures and Functions: Variables, data types, operators, control structures, functions, and arrays.
3. DOM Manipulation: Accessing and manipulating the Document Object Model (DOM) using JavaScript.
4. Events and Event Handling: Handling user events, event propagation, and delegation.

Unit-V: Test and Tutorials (05 Periods)

In addition to CIA, Tutorial, Seminars, Assignments & case studies are to be given for building proficiency in the course. (Respective course in-charge should maintain the records for the same).

Textbook

1. WEB TECHNOLOGIES 2010 by Uttam K.
2. Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics" 5th Edition by Jennifer Niederst Robbins
3. "Responsive Web Design with HTML5 and CSS" by Ben Frain
   https://vdoc.pub/download/responsive-web-design-with-html5-and-css3-5vk0jcsnmdv0

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8. Data Visualization: Bar Charts

How do you create bar charts to visualize the frequency or proportion of categorical variables in a dataset using R?

9. Probability Distributions

How do you generate random samples from binomial, Poisson, normal, and exponential distributions in R? How can you visualize the results using histograms?

10. Confidence Intervals

How do you calculate confidence intervals for population means and proportions using the t-distribution in R? How do you interpret the results?

11. Hypothesis Testing: t-test

How do you conduct one-sample, two-sample, and paired t-tests in R? How do you interpret the results and draw conclusions?

12. Hypothesis Testing: Chi-square Test

How do you conduct chi-square tests for goodness-of-fit and independence in R? How do you interpret the results and draw conclusions?

13. Simple Linear Regression

How do you fit a simple linear regression model to a dataset in R? How do you interpret the coefficients and assess the model's performance using R-squared?

14. Model Diagnostics and Assumptions

How do you check the assumptions of a linear regression model (normality of residuals, heteroskedasticity, multicollinearity) in R? What transformations or modifications can you perform if necessary?

15. Multiple Linear Regression

How do you fit a multiple linear regression model to a dataset in R? How do you interpret the coefficients and assess the model's performance using R-squared and adjusted R-squared?

Course Code: CS-334P	Course Title: Lab Course (based on CS-332T)
Total Credit: 1.5	Marks: 50 (UA: 40 + IA: 10)
Periods: 3 per week (50 Minutes each)	

Sample List of experiments to be carried out based on the course **CS-332T**

Unit I: Introduction

1. Setting up a local web server and creating a simple HTML webpage using a text editor.
2. Examining the HTTP request and response headers in the developer tools of a web browser.
3. Writing and testing a simple client-side JavaScript program using a web browser console.

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Learning Outcomes

After Completion of the Course students will be able to

1. Define and explain the scope and benefits of office automation.
2. Create and format documents using word processing tools.
3. Manage data using spreadsheet and database management tools.
4. Use communication and collaboration tools securely and maintain data privacy.

Unit -I: Introduction to Office Automation (10 Periods)

1. Definition and scope of office automation
2. Benefits of office automation
3. Overview of office automation tools and applications
4. History of office automation
5. Trends in office automation

Unit -II: Word Processing and Document Management (10 Periods)

1. Creating and formatting basic documents
2. Advanced formatting techniques (e.g. styles, templates, themes)
3. Working with tables and columns
4. Managing document content and structure
5. Reviewing and revising documents
6. Document sharing and collaboration
7. Automating document creation (e.g. mail merge, macros)

Unit -III: Spread sheet and Database Management (10 Periods)

1. Creating and managing basic spreadsheets
2. Advanced formatting techniques (e.g. conditional formatting, data validation)
3. Data analysis and visualization (e.g. charts, pivot tables)
4. Database management and design (e.g. creating tables, relationships, queries)
5. Importing and exporting data
6. Automating tasks (e.g. macros, scripts)

Unit -IV: Communication and Collaboration Tools; Security and Privacy in Office Automation (10 Periods)

1. Email and instant messaging basics
2. Advanced email features (e.g. filters, rules, signatures)
3. Online meetings and web conferencing basics
4. Advanced collaboration tools (e.g. shared calendars, task lists, project management)
5. Security threats and risks in office automation
6. Data protection and encryption basics
7. Best practices for secure communication and collaboration

Unit-V: Test and Tutorials (05 Periods)

In addition to CIA, Tutorial, Seminars, Assignments & case studies are to be given for building proficiency in the course. (Respective course in-charge should maintain the records for the same).

Textbook

1. "Office Automation: Principles and Practice" by Dr. R. K. Singla and Dr. N. P. Singh.
2. "Office Automation and Collaboration" by Prakash Rao

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10. Create a template for a recurring document like a meeting agenda or report.

Unit -III: Spreadsheet and Database Management

1. Create a basic spreadsheet and input some sample data.
2. Apply conditional formatting and data validation to a spreadsheet.
3. Create a chart and a pivot table to analyze the data in your spreadsheet.
4. Use a database tool to create tables, relationships, and queries.
5. Import data from an external source into your database.
6. Export data from your database to a spreadsheet.
7. Automate a simple task in your spreadsheet or database using macros or scripts.
8. Practice analyzing large sets of data in your spreadsheet.
9. Create a database query that requires multiple conditions.
10. Create a form for data entry in your database.

Unit -IV: Communication and Collaboration Tools; Security and Privacy in Office Automation

1. Create an email account and send a message.
2. Set up an email filter, rule, and signature.
3. Participate in an online meeting or web conference.
4. Use a collaboration tool to create shared calendars, task lists, or manage a project.
5. Research common security threats in office automation and summarize your findings.
6. Use a tool to encrypt a message or a file.
7. Create a guide for best practices in secure communication and collaboration.
8. Demonstrate how to securely share a file or document with others.
9. Create a mock phishing email and discuss how to identify and handle such threats.
10. Investigate a recent data breach related to office automation and present a case study.

Course Assessment (Full 50 Marks Internal Assessment)

Here are some potential assessments that could be used to evaluate understanding and practical skills for this course:

Unit -I: Introduction to Office Automation

1. **Paper/Report:** Submit a report on the history and evolution of office automation.
2. **Presentation:** Give a presentation on current trends in office automation.
3. **Case Study Evaluation:** Evaluate a case study on a company that has successfully implemented office automation.

Unit -II: Word Processing and Document Management

1. **Document Creation:** Create a document using advanced formatting techniques such as styles, templates, and themes.
2. **Mail Merge Assignment:** Perform a mail merge operation and submit the resulting documents.
3. **Collaborative Document Editing:** Participate in a collaborative document editing exercise and demonstrate the ability to review and revise the document.

Unit -III: Spreadsheet and Database Management

1. **Spreadsheet Assignment:** Create a complex spreadsheet that includes conditional formatting, data validation, charts, and pivot tables.

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The process of critical thinking, Inductive and deductive reasoning, Difference between reading and thinking, Reason to Adopt Critical Thinking, How critical thinking solves problems

Unit -III: Improving Decision Making (10 Periods)

Getting logical thinking, Strategies to improve decision-making skills, Making better decisions

Unit -IV: Applying Critical Thinking (10 Periods)

Strategies to help improve critical thinking, Group decision-making skills, Applying questions in critical thinking, Exercising the brain

Unit-V: Test and Tutorials (05 Periods)

In addition to CIA, Tutorial, Seminars, Assignments & case studies are to be given for building proficiency in the course. (Respective course in-charge should maintain the records for the same).

Textbook

1. "Critical Thinking: Proven Strategies To Improve Decision Making Skills, Increase Intuition And Think Smarter" by Simon Bradley.

References:

1. Thinking Critically" by John Chaffee (Oxford University Press India)
2. "Critical Thinking: An Introduction" by Alec Fisher (Cambridge University Press India)
3. "The Miniature Guide to Critical Thinking" by Richard Paul and Linda Elder (Foundation for Critical Thinking India)
4. "Asking the Right Questions: A Guide to Critical Thinking" by M. Neil Browne and Stuart M. Keeley (Pearson India)"Critical Thinking: Tools for Taking Charge of Your Learning and Your Life" by Richard Paul and Linda Elder (Pearson India)

E-Resources

1. https://argumentful.com/16-best-free-online-critical-thinking-courses/

Course Assessment (Full 50 Marks Internal Assessment)

To assess the skills acquired in a critical thinking course, you can use a combination of formative and summative assessment methods, including written assignments, discussions, group activities, quizzes, tests, and self-assessment. Here are some suggestions:

1. **Written Assignments**: Assign tasks that require students to analyze, evaluate, and synthesize information, such as essays, case studies, and reflections. These assignments can be graded based on predefined rubrics that outline expectations for clarity, depth, and logical reasoning.
2. **Discussions:** Organize in-class or online discussions in which students are required to critically analyze and evaluate different viewpoints, arguments, or evidence. Encourage students to ask probing questions and provide reasoned responses. Assess students' participation and the quality of their contributions.
3. **Group Activities**: Assign group projects or activities that require students to collaborate, analyze problems, and develop solutions using critical thinking skills. Evaluate the projects based on the quality of the work produced, as well as each student's participation and contribution to the group.
4. **Quizzes and Tests**: Create quizzes and tests that evaluate students' understanding of critical thinking concepts and their ability to apply these skills. Assessments can include multiple-choice questions, true/false questions, and short-answer questions. Quizzes can be administered throughout the course to gauge understanding, while tests can be used at

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B. Sc. (Computer Science)

Semester - IV

Curriculum for semester IV

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Course: B.Sc. (I.T.), BCA (Science) & B.Sc. (Computer Science)

Semester: IV

Communication Skill in English - IV

Course Code: CA-451T BCA (Science),
CS-451T B. Sc. (Computer Science),
IT-451T B.Sc. (IT)

Course Title: Advanced Corporate Communication in IT

Total Credit: 3 Marks: 50 (UA: 40 + IA: 10)
Periods: 3 per week (50 Minutes each)

Prerequisites:
There are no prerequisites for attending this course.

Learning Objectives

- Understand the principles and techniques of effective digital communication.
- Develop skills for effective intercultural communication within an IT context.
- Learn strategies for effective public speaking and presentation within an IT context.
- Understand the principles of leadership communication in the IT industry.

Learning Outcomes

Upon successful completion of the course, the students will develop:

- Ability to write effective emails and use collaboration tools.
- Ability to understand cultural differences in communication and effectively communicate with international colleagues and clients.
- Ability to present technical information to a non-technical audience and manage stage fright.
- Ability to communicate effectively as a team leader or manager, including motivating team members and handling difficult conversations.

Course Outline

Unit I: Intercultural Communication

The Importance of Intercultural Communication in a Global IT Industry, Understanding Cultural Differences and Similarities, Techniques for Communicating Effectively Across Cultures, Strategies for Managing Intercultural Conflicts and Misunderstandings, Techniques for Building and Maintaining Intercultural Relationships, Workshop: Practice in Intercultural Communication and Relationship Building.

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Reference Books:

1. "Technical Communication" by Mike Markel and Stuart A. Selber
2. "A Guide to the Project Management Body of Knowledge (PMBOK® Guide)" by Project Management Institute
3. "Influence: Science and Practice" by Robert B. Cialdini
4. "The Art of Explanation: Making your Ideas, Products, and Services Easier to Understand" by Lee LeFever
5. "The Culture Map: Breaking Through the Invisible Boundaries of Global Business" by Erin Meyer
6. "Talk Like TED: The 9 Public-Speaking Secrets of the World's Top Minds" by Carmine Gallo
7. "Leadership Communication" by Deborah J. Barrett

Online Resources

https://www.thebalancecareers.com/communication-skills-list-2063779

https://study.com/academy/lesson/technical-communication-definition-purpose.html

https://www.skillsyouneed.com/ips/intercultural-communication.html

https://www.mindtools.com/CommSkll/PublicSpeaking.htm

https://www.forbes.com/sites/mikemyatt/2012/04/04/10-communication-secrets-of-great-leaders/

https://www.ready.gov/business/implementation/crisis

https://www.helpguide.org/articles/relationships-communication/conflict-resolution-skills.htm

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3. Building and maintaining positive relationships

Unit -IV: Applying EI in Personal and Professional Settings (10 Periods)

1. Applying EI in personal relationships, including family and friendships
2. Using EI in the workplace, including teamwork, leadership, and career development
3. Developing an action plan for improving EI skills and setting goals for personal and professional growth.

Unit-V: Test and Tutorials (05 Periods)

In addition to CIA, Tutorial, Seminars, Assignments & case studies are to be given for building proficiency in the course. (Respective course in-charge should maintain the records for the same).

Textbook

1. The Emotional Intelligence Handbook: A Complete Guide to Developing and Improving Your Emotional Intelligence by Anthony C. Mersino (2021)

References:

1. Emotional Intelligence: Why it can matter more than IQ by Daniel Goleman
2. Emotional Intelligence 2.0 by Travis Bradberry and Jean Greaves
3. The Emotional Life of Your Brain: How Its Unique Patterns Affect the Way You Think, Feel, and Live--and How You Can Change Them by Richard J. Davidson and Sharon Begley
4. Emotional Intelligence for Managers: Rise above the chaos of the workplace by R. Sridhar
5. The Power of Emotional Intelligence by Sanjay Singh
6. Emotional Intelligence at Work by Geetu Bharwaney
7. Mind Over Mood: Change How You Feel by Changing the Way You Think by Dennis Greenberger and Christine A. Padesky

E-Resources

2. Emotional Intelligence 2.0 website: https://www.emotionalintelligence2-0.com/
3. Greater Good Science Center at UC Berkeley: https://ggsc.berkeley.edu/topic/emotional_intelligence
4. MindTools Emotional Intelligence Toolkit: https://www.mindtools.com/pages/article/newCDV_59.htm
5. Harvard Business Review Emotional Intelligence articles: https://hbr.org/topic/emotional-intelligence
6. Psychology Today Emotional Intelligence articles: https://www.psychologytoday.com/us/basics/emotional-intelligence

Course Assessment (Full 50 Marks Internal Assessment)

Assessing the effectiveness of an emotional intelligence course can be challenging, but there are several practical assessments that can be used to demonstrate the skills acquired through the course. Here are some before and after tests that could be used to assess the effectiveness of an emotional intelligence course:

1. **Self-Assessment**: Before and after the course, students could be asked to complete a self-assessment of their emotional intelligence using a standardized tool such as the Emotional Intelligence Appraisal or the Mayer-Salovey-Caruso Emotional Intelligence Test. The results of these assessments could be compared to show any changes in their emotional intelligence.
2. **Role-Play Exercises**: Before and after the course, students could be asked to participate in a

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