Uttarakhand Sanskrit University, Haridwar

COMPUTER (SEC) SYLLABUS

FOR

Shastri (B.A. Honors)

Semester- I, II, III, IV, V and VI

SEC (Skill Enhancement Course)

Subject - Computer

(SEC-01, SEC-02, SEC-03, SEC-04, SEC-05, SEC-06)

(NEP-2020)

(Effective from Year 2026-27)

Uttarakhand Sanskrit University, Haridwar
Shastri (B.A. Honors) – I, II, III, IV, V and VI Semester
SEC (Skill Enhancement Course)
Subject - Computer (SEC-01, SEC-02, SEC-03, SEC-04, SEC-05, SEC-06)

Objectives of the Computer Skill Enhancement Course (SEC)	The Computer Skill Enhancement Course is designed to develop basic digital literacy and practical computer skills among Shastri (B.A.) students. The syllabus provides a gradual understanding of computer fundamentals, data handling, office applications, Internet and web technologies, cyber security, Artificial Intelligence, Natural Language Processing, and digital tools for Sanskrit learning, teaching, research and communication. **The syllabus aims to:** 1. Develop basic knowledge and confidence in using computers and digital technologies for academic, professional and day-to-day activities. 2. Familiarize students with computer hardware, software, operating systems, memory, storage devices and basic computer terminology. 3. Develop basic skills for collecting, organizing, analysing and presenting data using simple digital tools. 4. Enable students to use word-processing, spreadsheet and presentation applications for preparing academic and professional documents. 5. Develop awareness and practical skills related to Internet services, digital communication, ICT applications and basic web technologies. 6. Introduce students to Artificial Intelligence, Natural Language Processing and commonly used AI tools, with emphasis on their applications in education, research and daily life. 7. Develop awareness of cyber security, cyber-crimes, digital privacy and safe and responsible use of computers, Internet services and digital platforms. 8. Familiarize students with digital resources, applications and platforms useful for Sanskrit learning, teaching, research, preservation and communication. 9. Develop the ability to use digital learning platforms, online resources, MOOCs, LMS and other educational technologies for lifelong learning. 10. Encourage the responsible, ethical and effective use of emerging digital technologies in academic and social contexts.

Program Outcomes (POs)	After successful completion of the Shastri (B.A. Honors) programme with Computer as a Skill Enhancement Course, students will be able to: **PO1.** Demonstrate basic knowledge of computers, digital technologies and their applications in academic and everyday life. **PO2.** Develop basic digital, analytical and problem-solving skills for academic and practical purposes. **PO3.** Use computer applications and digital resources for learning, teaching, communication and research. **PO4.** Apply appropriate digital tools to collect, organize, analyse and present information in simple and meaningful forms. **PO5.** Use Internet and digital services responsibly, safely and ethically, with awareness of cyber security and digital privacy. **PO6.** Develop the ability to adapt to emerging digital technologies and use them for lifelong learning and professional development. **PO7.** Apply digital technologies for learning, preservation, communication and promotion of Sanskrit language, literature and cultural knowledge.
Medium of Instruction	**Hindi / English**
Program Passing Rules	As per norms of University.

Computer - SEC (Skill Enhancement Course)

Semester.	SEC	Paper Name	Credit	Total Marks
I	**SEC-01**	Computer Fundamentals	02	100
II	**SEC-02**	Data Science	02	100
III	**SEC-03**	Office Productivity and Digital Content Creation	02	100
IV	**SEC-04**	Internet and Web Technology	02	100
V	**SEC-05**	Artificial Intelligence & NLP	02	100
VI	**SEC-06**	Digital-Based Models for Sanskrit Learning and Communication	02	100

Uttarakhand Sanskrit University, Haridwar
Shastri – I Semester
SEC-01 (Computer)
Paper Name: Computer Fundamentals

SEC-01: COMPUTER FUNDAMENTALS

Objective:

The course aims to provide students with a basic understanding of computers and their essential components. It introduces computer hardware, memory, storage devices, software, computer languages, number systems and operating systems. The course is designed to develop basic practical knowledge required for the effective use of computers in academic and day-to-day activities.

The course aims to:

1. Introduce the basic concepts, characteristics and applications of computers.
2. Familiarize students with the major hardware components of a computer system.
3. Explain different types of input, output, memory and storage devices.
4. Introduce system software, application software and basic computer security concepts.
5. Develop an elementary understanding of computer languages, number systems, ASCII and Unicode.
6. Familiarize students with the basic functions and use of Windows and Linux operating systems.
7. Develop basic skills for managing files, folders and common system settings.

Course Outcomes (COs):

After successful completion of this course, the student will be able to:

- **CO1.** Explain the basic concepts, characteristics, types and applications of computers.
- **CO2.** Identify the major hardware components, input/output devices, memory and storage devices of a computer.
- **CO3.** Differentiate between system software and application software and explain the basic purpose of antivirus software.
- **CO4.** Explain the basic concepts of computer languages, binary number system, ASCII and Unicode, with awareness of the importance of Unicode for Indian-language and Sanskrit typing.
- **CO5.** Describe the basic functions and features of an operating system.
- **CO6.** Perform basic file, folder and system-management tasks using Windows operating system.
- **CO7.** Identify the basic features and uses of Linux operating system.

SEC-01: COMPUTER FUNDAMENTALS

Total Credit: 02

Total Marks: 100

Unit	Topic	Credit
1	**Introduction to Computers:** Introduction to computers; concept of a computer system; characteristics, advantages and limitations of computers; types of computers; basic components of a computer system. **Hardware Components:** Introduction to computer hardware; CPU, motherboard and UPS; input and output devices. **Memory and Storage:** Introduction to computer memory; RAM, ROM and cache memory; storage devices and hard disk. **Software:** Introduction to software; system software and application software; basic concept of computer virus and antivirus.	01
2	**Computer Languages and Data Representation:** Basic concept of machine language, assembly language and high-level language; basic concept of binary number system; introduction to Unicode and its importance in Indian-language and Sanskrit typing. **Operating System:** Meaning and basic functions of an operating system; types of operating systems; introduction to commonly used operating systems; basic features of Windows OS including desktop, taskbar, icons, menus and running applications. **File and Folder Management:** Creating, renaming, copying and deleting files and folders; basic file organization; simple system settings; introduction to Linux operating system.	01

Learning Resources & Reference Books:

1. Sinha, Pradeep K., and Priti Sinha. Computer Fundamentals: Concepts, Systems and Applications. 8th ed. BPB Publications.
2. Goel, Anita. Computer Fundamentals. Pearson Education India, 2010.
3. Jain, Satish, et al. IT Tools and Business Systems. BPB Publications.
4. Rajaraman, V., and Neeharika Adabala. Fundamentals of Computers. 7th ed. PHI Learning, 2025.
5. Microsoft. Windows Help & Learning. Microsoft.

Uttarakhand Sanskrit University, Haridwar
Shastri – II Semester
SEC-02 (Computer)
Paper Name: Data Science

SEC-02: DATA SCIENCE

Course Objective:

The course aims to introduce students to the basic concepts of Data Science and its practical applications. It focuses on basic data collection, organization, analysis and graphical presentation without requiring advanced mathematics or programming. Special emphasis is given to the use of data in education, research and Sanskrit studies.

The course aims to:

1. Introduce the meaning, basic concepts and importance of Data Science.
2. Familiarize students with different types and sources of data.
3. Develop basic skills in collecting, organizing and entering data in a structured format.
4. Introduce simple methods of data analysis using counting, total, percentage and average.
5. Develop the ability to present data using tables and basic charts.
6. Enable students to interpret simple data and identify basic trends.
7. Explain the applications of data and Data Science in education, society, research and Sanskrit studies.

Course Outcomes (COs):

After successful completion of this course, the student will be able to:

- **CO1.** Explain the basic concepts, importance and applications of Data Science.
- **CO2.** Identify different types and sources of data used in academic and practical situations.
- **CO3.** Collect, organize and enter simple data in a structured tabular format using Microsoft Excel.
- **CO4.** Perform basic data analysis using counting, total, percentage and average.
- **CO5.** Sort, filter and summarize simple datasets using Microsoft Excel.
- **CO6.** Create and interpret basic charts such as bar charts, pie charts and line charts.
- **CO7.** Explain simple applications of data and Data Science in education, society, research and Sanskrit studies.

SEC-02: DATA SCIENCE

Total Credit: 02
Total Marks: 100

Unit	Topic	Credit
1	**Introduction to Data Science:** Meaning and basic concept of data and Data Science; importance and applications of Data Science in daily life, education and research; basic steps of Data Science. **Types and Sources of Data:** Qualitative and quantitative data; numerical and categorical data; primary and secondary data; structured and unstructured data; basic methods and sources of data collection including surveys, questionnaires, educational and institutional records, books, documents and digital resources; precautions in data collection. **Data and Sanskrit Studies:** Basic concept of data related to Sanskrit students and learners; digital Sanskrit resources and Sanskrit books and manuscripts as sources of information; basic use of data in Sanskrit education and research.	01
2	**Spreadsheet-Based Data Management using Microsoft Excel:** Introduction to Microsoft Excel for data management; creating and managing worksheets and workbooks; entering, editing and formatting data; basic data validation; organizing data using rows, columns, records and variables; sorting and filtering data; use of basic Excel functions. **Basic Data Analysis:** Counting and frequency; total and percentage; average (mean); comparison of data; highest and lowest values. **Data Visualization and Interpretation:** Meaning and importance of data visualization; tables and graphical representation; bar chart, pie chart and line chart; selection of an appropriate chart; reading and comparing tables, charts and graphs; identifying simple trends and drawing basic conclusions.	01

Learning Resources & Reference Books:

1. Provost, Foster, and Tom Fawcett. Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking. O'Reilly Media, 2013.
2. Lalwani, Lokesh. Excel 2019 All-In-One: Master the New Features of Excel 2019 / Office 365. 1st ed. BPB Publications, 2019.
3. Sinha, Pradeep K., and Priti Sinha. Computer Fundamentals. 8th ed. BPB Publications.
4. Microsoft. Excel Help & Learning. Microsoft.

Uttarakhand Sanskrit University, Haridwar
Shastri – III Semester
SEC-03 (Computer)
Paper Name: Office Productivity and Digital Content Creation

SEC-03: OFFICE PRODUCTIVITY AND DIGITAL CONTENT CREATION

Course Objective:

The course aims to develop basic practical skills in using office productivity applications for academic, professional and educational purposes. It introduces word processing, digital presentations and the basic concepts of Database Management Systems (DBMS), with emphasis on preparing academic documents and digital educational content related to Sanskrit studies.

The course aims to:

1. Develop basic practical skills in using commonly used office productivity applications.
2. Enable students to create, edit and format academic and professional documents.
3. Develop basic skills for preparing effective digital presentations.
4. Introduce the basic concepts and applications of Database Management Systems (DBMS).
5. Familiarize students with Unicode and Devanagari/Sanskrit typing for academic work.
6. Enable students to prepare simple digital educational content related to Sanskrit studies.
7. Develop awareness of commonly used digital document formats such as DOCX, ODT and PDF.

Course Outcomes (COs):

After successful completion of this course, the student will be able to:

- **CO1.** Identify and explain the basic features and uses of commonly used office productivity applications.
- **CO2.** Create, edit and format academic documents using word-processing software.
- **CO3.** Prepare structured academic documents using tables, lists, page settings, headers, footers, page numbers, footnotes and basic graphics.
- **CO4.** Create and deliver a simple digital presentation using text, images, tables, charts and appropriate multimedia elements.
- **CO5.** Explain the basic concepts of databases and Database Management Systems (DBMS), including tables, fields, records and primary keys.
- **CO6.** Identify simple applications of DBMS in offices, libraries and educational institutions.
- **CO7.** Use Unicode/Devanagari input and digital tools to prepare simple academic or educational content related to Sanskrit studies.

SEC-03: OFFICE PRODUCTIVITY AND DIGITAL CONTENT CREATION

Total Credit: 02
Total Marks: 100

Unit	Topic	Credit
1	**Office Productivity** and Academic Document Preparation: Introduction to office productivity applications such as MS Office, LibreOffice and Google Docs; **Word processing**: creating, opening, saving and editing documents; text and paragraph formatting; lists; tables; page setup, margins and orientation; headers and footers; page numbering; find and replace; inserting images and basic graphics; basic footnotes and endnotes; Unicode and Devanagari/Sanskrit typing; basic mail merge; PDF creation and conversion; preparation of a simple academic document.	01
2	**Introduction to presentation software**; creation and formatting of slides; adding text, images, tables, charts and multimedia; transitions and animations; slide show; preparation of a simple presentation on a Sanskrit-related topic. **Introduction to DBMS**: meaning and basic concept of database and DBMS; tables, fields and records; basic concept of primary key; simple applications of databases in offices, libraries and educational institutions.	01

Recommended Learning Resources & Reference Books:

1. Sinha, Pradeep K., and Priti Sinha. Computer Fundamentals. 8th ed. New Delhi: BPB Publications.
2. Jain, Satish, Shalini Jain, and M. Geetha. Basic Computer Course Made Simple (BCC): MS Office 2010. BPB Publications.
3. Microsoft. Microsoft 365 Help & Learning. Microsoft.
4. The Document Foundation. LibreOffice Documentation: Writer, Impress and Getting Started Guides.
5. Elmasri, Ramez, and Shamkant B. Navathe. Fundamentals of Database Systems. 7th ed. Pearson.

Uttarakhand Sanskrit University, Haridwar
Shastri – IV Semester
SEC-04 (Computer)
Paper Name: Internet and Web Technology

SEC-04: INTERNET AND WEB TECHNOLOGY

Course Objective:

The course aims to provide students with basic knowledge and practical skills related to the Internet, digital communication, cyber safety and web technologies. It introduces commonly used Internet services, basic cyber-security practices and elementary HTML skills for creating simple web pages. The course is designed to support the academic and educational needs of Shastri students.

The course aims to:

1. Introduce the basic concepts of computer networks, Internet and World Wide Web.
2. Familiarize students with common Internet services and digital communication tools.
3. Develop basic skills for using web browsers and search engines for academic purposes.
4. Develop awareness of cyber security, common cyber crimes and safe digital practices.
5. Introduce the basic concepts of web pages, websites and client-server architecture.
6. Develop basic skills for creating simple web pages using HTML.
7. Encourage responsible and appropriate use of Internet and web technologies for academic and educational purposes.

Course Outcomes (COs):

After successful completion of this course, the student will be able to:

- **CO1.** Explain the basic concepts of computer networks, Internet and World Wide Web.
- **CO2.** Identify and differentiate basic types of computer networks such as LAN, MAN and WAN.
- **CO3.** Use web browsers, search engines, email and common digital communication services for academic purposes.
- **CO4.** Identify common cyber-security risks and apply basic safe practices while using the Internet and digital communication services.
- **CO5.** Explain the basic concepts of web pages, websites and client-server architecture.
- **CO6.** Describe the basic structure and elements of an HTML document.
- **CO7.** Create a simple web page using basic HTML elements such as headings, paragraphs, text formatting, images, hyperlinks, tables and lists.

SEC-04: INTERNET AND WEB TECHNOLOGY

Total Credit: 02

Total Marks: 100

SEC-04	Topic	Credit
1	**Computer Network:** Introduction to computer networks; LAN, MAN and WAN; **Internet:** Basic concept of Internet and World Wide Web; common Internet services; basic methods of Internet connectivity such as Wi-Fi, hotspot and broadband; web browsers and search engines; email; online messaging and communication; audio and video conferencing; Introduction to ICT and its applications in education and communication. **Cyber Security:** Introduction to Cyber Security and Cyber Crimes, Cyber Security Need, Goal of Cyber Security.	01
2	**Web Technologies:** Introduction to web technologies; basic applications of web technologies; web page and website; basic concept of client-server architecture. **HTML:** Introduction to HTML; structure of an HTML document; basic HTML tags; title, head and body sections; headings and paragraphs; basic text formatting; images; hyperlinks; designing a simple web page using HTML.	01

Learning Resources & Reference Books:

1. Sinha, Pradeep K., and Priti Sinha. Computer Fundamentals. 8th ed. BPB Publications, New Delhi, 2023.
2. Jain, Satish, and M. Geetha Iyer. O Level Made Simple: IT Tools & Network Basics (M1-R5). BPB Publications, 2020.
3. Jain, Satish, and M. Geetha Iyer. Web Designing and Publishing. BPB Publications, 2020.
4. Godbole, Nina, and Sunit Belapure. Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives. Wiley India, 2011.
5. Indian Computer Emergency Response Team (CERT-In), Ministry of Electronics and Information Technology, Government of India. Cyber Security Awareness Booklets, Safety Tips and Guidelines.

Uttarakhand Sanskrit University, Haridwar
Shastri – V Semester
SEC-05 (Computer)
Paper Name: Artificial Intelligence & NLP

SEC-05: ARTIFICIAL INTELLIGENCE & NLP

Course Objective:

The course aims to introduce students to the basic concepts and applications of Artificial Intelligence (AI), Generative AI and Natural Language Processing (NLP). It familiarizes students with commonly used AI tools and their applications in education, research and daily life. The course also introduces basic language-processing applications with emphasis on Indian languages and Sanskrit.

The course aims to:

1. Introduce the basic concepts, objectives and applications of Artificial Intelligence.
2. Familiarize students with Generative AI and commonly used AI tools.
3. Explain the benefits, limitations and responsible use of Artificial Intelligence.
4. Introduce the basic concepts and applications of Natural Language Processing.
5. Familiarize students with basic AI and NLP applications in language and education.
6. Introduce the applications of AI and NLP in Indian languages, with special reference to Sanskrit.
7. Develop awareness of ethical, responsible and academic use of AI-generated information and content.

Course Outcomes (COs):

After successful completion of this course, the student will be able to:

- **CO1.** Explain the basic concepts, objectives, applications, advantages and limitations of Artificial Intelligence.
- **CO2.** Identify commonly used AI and Generative AI tools and describe their basic applications in education, research and daily life.
- **CO3.** Explain the basic concept of Generative AI and its use for creating text and other digital content.
- **CO4.** Describe the basic concepts and applications of Natural Language Processing (NLP).
- **CO5.** Identify basic NLP applications such as text processing, machine translation, speech recognition and chatbots.
- **CO6.** Explain the relevance of AI and NLP for Indian languages and identify basic applications related to Sanskrit language and education.
- **CO7.** Apply basic principles of responsible and ethical use of AI, including verification of AI-generated information and appropriate academic use.

SEC-05: ARTIFICIAL INTELLIGENCE & NLP

Total Credit: 02

Total Marks: 100

Unit	Topic	Credit
1	**Artificial Intelligence and Generative AI:** Introduction to Artificial Intelligence (AI); meaning, objectives and basic concepts of AI; applications of AI in daily life, education and research; advantages and limitations of AI; introduction to Generative AI; commonly used Generative AI tools and their applications; basic concept of AI-generated text and digital content; responsible use of AI; limitations of AI-generated information; basic principles of AI ethics; verification of AI-generated content.	01
2	**Natural Language Processing and Language Applications:** Introduction to Natural Language Processing (NLP); basic idea of how computers process human language; applications of NLP; basic text processing; language translation; speech recognition; chatbots and virtual assistants; basic applications of NLP in Indian languages; introduction to language technology for Sanskrit; examples of AI and NLP applications in Sanskrit learning, teaching and research.	01

Learning Resources & Reference Books:

1. Bhattacharyya, Pushpak, and Aditya Joshi. Natural Language Processing. Wiley India, 2023. ISBN: 978-93-5746-238-9.
2. Kulkarni, Amba. Sanskrit Parsing: Based on the Theories of Śābdabodha. Indian Institute of Advanced Study and D.K. Printworld, 2019. ISBN: 978-81-246-0988-0.
3. Kulkarni, Amba (Ed.). Sanskrit and Computational Linguistics. D.K. Printworld Publishers, 2016.
4. Miao, Fengchun, and Wayne Holmes. Guidance for Generative AI in Education and Research. UNESCO, 2023.
5. Huet, Gérard, Amba Kulkarni, and Peter Scharf (Eds.). Sanskrit Computational Linguistics: First and Second International Symposia, Revised Selected Papers. Springer, 2009.

Uttarakhand Sanskrit University, Haridwar
Shastri – VI Semester
SEC-06 (Computer)
Paper Name: Digital-Based Models for Sanskrit Learning and Communication

SEC-06: DIGITAL-BASED MODELS FOR SANSKRIT LEARNING AND COMMUNICATION

Course Objective:

The course aims to familiarize students with essential digital tools and platforms that can support Sanskrit learning, teaching, research and communication. It introduces Sanskrit learning applications, OCR, digital libraries, transliteration tools, research portals, MOOCs and LMS platforms. The course also develops basic skills for creating educational vlogs and blogs for Sanskrit communication.

The course aims to:

1. Familiarize students with digital tools and resources useful for Sanskrit studies.
2. Introduce Sanskrit learning applications, OCR tools, research portals, digital libraries and transliteration tools.
3. Develop basic awareness of digital processing and digitization of Sanskrit texts.
4. Familiarize students with MOOCs and LMS platforms for Sanskrit learning.
5. Enable students to explore and use online Sanskrit learning resources.
6. Introduce blogs and vlogs as digital media for Sanskrit communication.
7. Develop basic skills for preparing and sharing simple Sanskrit-related digital content.
8. Encourage responsible and effective use of digital technologies for Sanskrit learning, teaching, research and communication.

Course Outcomes (COs):

After successful completion of this course, the student will be able to:

- **CO1.** Identify and describe commonly used digital tools and resources for Sanskrit learning and research.
- **CO2.** Use basic Sanskrit learning applications, OCR tools, research portals, digital libraries and transliteration tools for academic purposes.
- **CO3.** Explain the basic process of digitizing and processing Sanskrit texts using digital tools.
- **CO4.** Identify and use suitable digital resources for searching, reading and accessing Sanskrit texts.
- **CO5.** Explain the role of MOOCs and Learning Management Systems (LMS) in Sanskrit education.
- **CO6.** Explore and use selected online courses and digital learning resources for Sanskrit studies.

CO7. Explain the role of blogs and vlogs in promoting Sanskrit language, literature and culture.

CO8. Prepare simple Sanskrit-related digital content for educational or communication purposes using appropriate digital platforms.

SEC-06: DIGITAL -BASED MODELS FOR SANSKRIT LEARNING AND COMMUNICATION

Total Credit: 02

Total Marks: 100

Unit	Topic	Credit
1	**Introduction to Digital Tools for Sanskrit Studies:** Introduction to various digital learning tools for Sanskrit studies; Sanskrit grammar-learning tools; Sanskrit learning apps; Sanskrit OCR (Optical Character Recognition) tools; Sanskrit research portals; digital libraries and online repositories; transliteration tools and techniques for digitization of Sanskrit texts. **Digital Processing of Sanskrit Language:** Basic introduction to digital processing of Sanskrit text; use of digital tools for searching, reading, editing and analyzing Sanskrit text, with simple examples related to Sandhi, Samasa and Pratyahara.	01
2	**MOOCs, LMS and Digital Communication for Sanskrit:** Introduction to Massive Open Online Courses (MOOCs) and their role in promoting Sanskrit education; selected Sanskrit courses available through SWAYAM, NPTEL and other online platforms; introduction to Learning Management Systems (LMS) and their use in Sanskrit learning. **Blogs and vlogs for Sanskrit Communication:** Introduction to blogs and vlogs; their role in promoting Sanskrit language and culture; basic steps for creating a Sanskrit educational blog or vlog; simple scripting, recording and editing using commonly available digital tools.	01

Learning Resources & Reference Books:

1. Upadhyaya, B. K. Information Technology for Sanskrit. Rashtriya Sanskrit Sansthan, New Delhi, 2011.
2. Chaudhuri, Supriya, and Sukanta Chaudhuri. Digital Humanities and Indian Culture. Routledge India, 2019. ISBN: 978-0367179702.
3. Huet, Gérard, Amba Kulkarni, and Peter Scharf, eds. Sanskrit Computational Linguistics: First and Second International Symposia. Springer, 2009.
4. Selected Open Educational Resources and authenticated digital resources on Sanskrit digitization, OCR, transliteration, digital libraries, MOOCs and LMS.