COURSES OF STUDY OFFERED AT RLA COLLEGE

SCIENCE

- B.Sc. (Honours) Computer Science
- B.Sc. (Honours) Geology
- B.Sc. (Honours) Microbiology
- B.Sc. (Honours) Statistics
- B.Sc. (Honours) Mathematics
- Bachelor of Management Studies

COMMERCE

- B.Com Programme
- B.Com (Honours)

HUMANITIES

- B.A (Honours) English
- B.A (Honours) Hindi
- B.A (Honours) Hindi PatrakaritaEvamJansanchar
- B.A (Honours) History
- B.A (Honours) Political Science
- B.A Programme
- M.A Hindi (Registration to be done by UDSC)

DEPARTMENT OF COMPUTER SCIENCE

Course offered: BSc (Honours) Computer Science

Link to syllabus:
http://www.du.ac.in/du/uploads/Syllabus_2015/B.Sc.%20Hon.%20Computer%20Science.pdf

Course Outcome:

This course is designed for students to get exposure on all aspects of computers right from the basic fundamentals of computers to the recent and advanced courses based on programming languages. Degree in Computer Science combines theoretical study and practical projects, teaching of subject-specific skills including programming languages, hardware architecture, network programming, software engineering, web application tools and packages and database concepts.

After this course students can pursue post graduate courses example M.C.A., M.Sc. Computer Science, M.Sc. (Information Technology), M.I.T., M.B.A., M.Sc. (OR) and M.Sc. (AOR) etc. This course is useful to develop a personal portfolio of your own projects, such as those involving programming, building a website or carrying out tasks online for example, your initiative and ability in fixing bugs, improving functionality or building an app will help show your skills and interest in the subject.

Various job opportunities include: Information Systems Manager, IT Consultant, Multimedia Programmer, Systems Developer, Web Designer and Web Developer.

Given below is a brief description of expected learning outcomes of the various papers taught as part of this three year under-graduate program. The course structure is the same as for all Honours Courses in Science.

Semester -I

1) **Programming Fundamentals using C++**

This Paper will help students to perform object oriented programming to develop solutions to problems demonstrating usage of control structures, modularity, inheritance, I/O and other

standard language constructs. This paper also includes a practical component which is designed to give the student hands on experience with the programming concepts.

2) **Computer System Architecture**

This paper imparts the knowledge on the Computer System Architecture i.e. the structure and behavior of the various functional modules of the computer and how their interaction amongst themselves to meet various processing needs of the user. It also provides the basic knowledge on how the hardware is connected to make a computer system and how hardware modules are developed.

Semester -II

1) **Programming in JAVA**

This Paper will impart students with the knowledge of the structure and model of the Java programming language. It will also enable them to demonstrate programs on advance concepts like inheritance, packages, exceptions, multithreading and applets and will help them to understand how to model real world scenario.

2) **Discrete Structures**

This Paper helps the students to be familiar with constructing proofs, elementary formal logic, set algebra, recurrence relations, graphs and trees, relations and functions. It also helps in learning fundamental mathematical concepts and terminology.

Semester -III

1) **Data Structures**

To teach about efficient data storage mechanisms for easy access;design and implementation of various basic and advanced data structures. It helps students to know about various techniques for representation of the data in the real world as well as improves the logical ability. Students will be able to choose appropriate data structure as applied to specified problem definition and will be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.

2) **Operating Systems**

This course covers the functions, structures and history of operating systems and gives the understanding of design issues associated with operating systems. The objective of the course is to understand scheduling, synchronization, deadlocks, multithreading, system resources sharing

among the users, file system interface and implementation, disk management, protection and security mechanisms.

3) **Computer Networks**

This course covers the terminology and concepts of the OSI reference model and the TCP-IP reference model, concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks. The objective of the course is to make students familiar with wireless networking concepts, contemporary issues in networking technologies, tools and network programming.

4) **Android Applications Development Programming**

This Paper will help students in learning, letting students develop competence and confidence in android programming and in understanding the entire Android Application Development Cycle, as well as it would also enable the students to independently create new Android Applications.

Semester -IV

1) **Design and Analysis of Algorithms**

This Paper will help them to learn good principles of algorithm design along with the knowledge of how to analyze algorithms and estimate their worst-case and average-case behavior (in easy cases)become familiar with fundamental data structures and with the manner in which these data structures can best be implemented

2) **Software Engineering**

This paper includes the knowledge of basic Software engineering methods and practices, and their appropriate application with a general understanding of software process models such as the waterfall and evolutionary models and understanding of the role of project management including planning, scheduling, risk management, etc.

3) **Database Management Systems**

This Paper helps the student to understand, appreciate and effectively explain the underlying concepts of database technologies, to design and implement a database schema for a given

problem-domain. The practical sessions impart them with the knowledge of normalization nd query a database using SQL DML/DDL commands.

4) **PHP Programming**

This Paper helps the students to get the basic knowledge of how server-side programming works on the web, its basic syntax for variable types and calculations along with the knowledge of using PHP built-in functions, custom functions and reading and writing cookies. Students will also learn the PHP programming skills needed to successfully build interactive, data-driven sites.

Semester -V

1) **Internet Technologies:**

This course covers the JAVA, JDBC, JAVA BEANS, JSP, and Java Script for developing programming applications and major Internet and web developments. The objective of this course to understand the concept of Object Oriented Programming through Java programming language and JavaScript and JSP scripting language have been used for the development of web application.

2) **Theory of Computation:**

This paper is introduced at the undergraduate level because of the deeper insights it yields on specific topics in computer science and serves to establish essential mathematical paradigms that permeate computer science.

3) **System Programming**

To make the student to understand the process involved in a compiler, create an overall view of various types of translators, linkers, loaders, and phases of a compiler, understand what is syntax analysis, various types of parsers especially the top down approach, awareness among students the various types of bottom up parsers, understand the syntax analysis and, intermediate code generation, type checking, the role of symbol table and its organization, Code generation, machine independent code optimization and instruction scheduling.

4) **Microprocessor**

By studying this paper students acquire thorough knowledge of Assembly Language Programming and interfacing of the Intel family of Microprocessors. This knowledge enables students to develop control software to control an application interface microprocessor.

Semester -VI

1) **Artificial Intelligence**

This Paper helps the students to understand:-

- The different types of AI agents
- How various AI search algorithms (uninformed, informed, heuristic, constraint satisfaction, genetic algorithms) work
- Understand the fundamentals of knowledge representation (logic-based, frame-based, semantic nets), inference and theorem proving

2) **Computer Graphics**

This course will introduce students to all aspects of computer graphics including hardware, software and applications. Students will gain experience using a graphics application programming interface by completing several programming projects.

On successful completion of this course students will be able to:

1. Understand the structure of modern computer graphics systems
2. Understand the basic principles of implementing computer graphics primitives
3. Familiarity with key algorithms for modelling and rendering graphical data
4. Develop design and problem solving skills with application to computer graphics
5. Gain experience in constructing interactive computer graphics programs.

3) **Machine Learning:**

This course introduces several fundamental concepts and methods for machine learning. The objective is to familiarize the students with some basic learning algorithms and techniques and their applications, as well as general questions related to analyzing and handling large data sets.

4) **Project:**

GENERIC ELECTIVES OFFERED BY DEPARTMENT OF COMPUTER SCIENCE TO STUDENTS OF OTHER COURSES

Semester 1

Introduction to Programming

The Paper covers Introduction of Object Oriented Programming concepts: classes, member functions, stream I/O and inheritance. It also provides an exposure to problem-solving through programming and aims to train the student to the basic concepts of the C++ programming language.

Semester 2

Introduction to Database System

This Paper helps the student to understand, appreciate and effectively explain the underlying concepts of database technologies, to design and implement a database schema for a given problem-domain. The practical sessions impart them with the knowledge of normalization and query a database using SQL DML/DDL commands.

Semester 3

Computer Networks and Internet Technologies

This paper introduces the basic knowledge on Computer Networks i.e. how the computers are connected in a network, what are the different layers, how data is travelled and exchanged between two computer systems. The second part deals with introduction of creating web pages, forms using HTML, and usage of little bit of JavaScript.

Semester 4

Information Security and Cyber Laws

Students will learn the basics of Information Security, Anatomy of information Security Attacks their countermeasures and Fundamentals of Cyber Law through Virtual Training Environment.

Semester 5: BA (Program) Generic Elective

IT Fundamentals

This course will provide the fundamental skills and concepts required to maintain, support, and work efficiently with personal computers. This course is designed to teach the students basic concepts of computer system, Networks and Internet. It includes computer hardware, computer software, networking, security, and basic IT literacy.

DEPARTMENT OF GEOLOGY

Geology – the science of earth and environment concerns with the processes and products of earth and atmosphere. This branch of natural science has interdisciplinary character and sister disciplines such as Chemistry, Physics, Biology and Engineering are used for evolving and innovating scientific models. Geology finds its potential application in various fundamental spheres of life including exploration and management of mineral and energy resources, ground water and surface water, land use and environment hazards viz. floods, landslides and seismicity, volcanoes and tsunamis, environmental protection by monitoring waste disposal sites including those for nuclear waste etc. through various techniques including geological mapping; detailed identification of structures like mountains, rivers, rocks; studying satellite data, in civil engineering projects like irrigation , bridges, tunnels, roads etc.

Being a fast economically developing country and increasing population, the nation is faced with innumerable problems related to depleting natural resources, acute shortage of energy, natural disasters and many types of environmental hazards. Two-third of Indian subcontinent lies in the seismic zones of moderate to severe intensity. Needless to say that solution to all these problems can be met by understanding the earth more intensively and extensively, which could be achieved only by providing opportunity to more number of young minds to pursue the course in Geology and consequently, will help the nation to overcome these problems.

Course Offered: B. Sc. (Honours) Geology

Link to syllabus:
http://www.du.ac.in/du/uploads/Syllabus_2015/B.Sc.%20Hons.%20Geology.pdf

Course outcome:

The course B.Sc. (Honours) Geology, aims to enable the students to be able to understand the processes and products of earth using Chemistry, Physics, Biology and Engineering. They are expected to have concepts on Mineral Science along with various branches of Petrology namely Igneous, Sedimentary and Metamorphic; identify different types of minerals, rocks and fossils through microscopy, hand specimens; understand the nature of various types of structures in rocks and the processes that produce them; learn about various stratigraphic sequences in different parts of the country and relate them with the mineral endowments in them and fossils of different geological age; basic concepts of ground water occurrence, chemistry, flow,

exploration, management; processes by which economic mineral deposits form, their occurrence in the country, basic of gemstones; basic concepts of geomorphology, various types of landforms and the processes that give rise to them, geomorphic features in the country; application of geology in planning, design and construction of major man-made structures, concepts about various properties of rocks affecting site selection, design and construction of these structures, improvement of site; concepts of Photogeology and Remote Sensing, different tools to study and interpret remotely sensed imageries, Geographic information System and its use in real life, basics of Digital Elevation Model and Global Positioning System; using different tools, both direct and indirect and surface and subsurface, to estimate mineral reserves; components of climate system, causes of its change, mechanism and variation in Monsoon; Processes of formation of coal and its presence in India, formation and accumulation of petroleum, its physical and chemical properties, its relation with plate tectonics, nuclear fuel; uses of geology in urban conditions like construction of surface and subsurface structures, waste management, planning precautions from seismic hazards. The student should be able to understand information from toposheets and relate it with real life conditions in the field, take measurements there and plot it, make maps using it and interpret structures from the bits and pieces of information available on ground and generate maps. He or she should learn to work individually and in groups both in the class room as well as in field. In the field should learn to face and overcome various kinds of difficulties, should help each other. At the time of graduation they should be equipped with basic knowledge in various branches of geology so that they can pursue higher studies in it or use it as a base for other preparing for other national level exams, most of all they should have good ethical values in the field of science and making of good citizens. In case they want to go abroad they should have a strong base.

After the successful completion of B.Sc. (Honours) course pupil are eligible for admission to courses M. Sc. / M. tech / M. Sc. Tech. In Geology / Applied geology / Remote sensing / Geo-informatics / Environmental science / Petroleum geology / Mining engineering at various universities of India and abroad. They are also eligible for admission to B. Ed. at various universities. Geology is one of the optional subjects for civil services, Forest Services and similar examinations.

After post-graduation in Geology, through UPSC placements can take place in Central Government Agencies like the Geological Survey of India (GSI) and the Central Ground water Board (CGWB). Para-military forces are also in constant need of Geologists. Experienced and well educated Geologists can also apply for top positions in the government, industry and education sector.

Government organizations like Directorate of Geology and Mining (DGM), Indian Bureau of Mines (IBM), Defence Research and Development Organisation (DRDO), Indian Space Research Organisation (ISRO), National Geophysical Institute (NGRI), Wadia Institute of Himalayan Geology, Dehradun, Bhabha Atomic Research Centre (BARC), Bharat Petroleum Corporation Limited, Mineral Exploration Authority, Indian Space Research Organisation recruit geologists.

PSUs like ONGC, Hindustan Zinc Ltd., National Hydro Power Corporation (NHPC), National Thermal Power Corporation (NTPC), Minerals and Metals Trading Corporation (MMTC), National Remote Sensing Agency (NRSA), State Mining Corporation (SMC), National Mineral Development Corporation (NMDC), NALCO Bharat Petroleum Corporation Limited (BPCL), Tehri Hydro Development Corporation (THDC), Mineral Exploration Authority hire Geologists.

Private sector companies like Broken Hill, Rio Tinto, De Beers, Cairn Energy, Reliance Energy, Shell, ERDAS, AFCONS, related to mines and minerals, petroleum, ground water, soil survey, Gem stone, ornamental and decorative stone industries, etc. and service providers like Schlumberger hire geologists.

Given below is a brief description of expected learning outcomes of the various papers taught as part of this three year under-graduate program. The course structure is the same as for all Honours Courses in Science

CORE COURSES

Paper -I
EARTH SYSTEM SCIENCE
A holistic understanding of the 'Earth' andit's magnetic field. Plate Tectonics, Hydrosphere and Atmosphere, Soil, Cosmic abundance of elements

Paper -II
MINERAL SCIENCE
Crystallography, Crystal symmetry and projections, Rock forming minerals, principles of optical mineralogy, petrological microscope and identification of common rock-forming minerals.

Paper -III
ELEMENTS OF GEOCHEMISTRY
Concepts of geochemistry, Layered structure of Earth and geochemistry, Element transport, Geochemistry of solid Earth, Geochemical behavior of selected elements

Paper -IV
STRUCTURAL GEOLOGY
Structure and Topography, Stress and strain in rocks, Folds, Foliation and lineation, Fractures and faults

Paper -V
IGNEOUS PETROLOGY
Concepts of Igneous petrology, Classification, Textures and Structures, Mode of occurrence of igneous rocks, Phase diagrams and petrogenesis of Felsic and Mafic igneous rocks, Magmatism in different tectonic settings

Paper -VI

SEDIMENTARY PETROLOGY
Origin of sediments, Sediment granulometry, Sedimentary textures, structures and environment, Varieties of sedimentary rocks, Diagenesis

Paper -VII
PALEONTOLOGY
Fossilization and fossil record, taxonomy and species concept, invertebrates, vertebrates, Introduction to paleobotany, Gondwana flora, Application of fossils in stratigraphy

Paper -VIII
METAMORPHIC PETROLOGY
Metamorphism: controls and types, Metamorphic facies and grades, zones, isograde, Chemographic projections, Metamorphism and Tectonism, Migmatites and their origin, Metamorphic rock associations

Paper -IX
STRATIGRAPHIC PRINCIPLES AND INDIAN STRATIGRAPHY
Principles of stratigraphy, International Stratigraphic Code, concepts of lithostratigraphy, biostratigraphy, chronostratigraphy, seismic stratigraphy, chemostratigraphy, Magnetostratigraphy, Sequence stratigraphy and their subdivisions with Indian examples, Principles of stratigraphic analysis Facies concept in stratigraphy, Physiographic and tectonic subdivisions of India, Phanerozoic Stratigraphy, Volcanic provinces of India, Stratigraphic boundaries

Paper -X
HYDROGEOLOGY
Introduction and basic concepts, Groundwater flow, Well hydraulics and Groundwater exploration, Groundwater chemistry, Groundwater management

Paper -XI
ECONOMIC GEOLOGY
Ores and gangues, Mineral deposits and Classical concepts of Ore formation, Mineral exploration and exploitation techniques
Structure and texture of ore deposits, assessment of grade, reserve estimation, Metallic and Nonmetallic ores, Introduction to gemstones

Paper -XII
GEOMORPHOLOGY
Endogenic and Exogenic processes and their interaction, Geoid, Topography, Global Hypsometry, Major Morphological features, Ocean basins, Plate tectonics overview, Landforms associated with Weathering, Hill slopes Glacial, Periglacial processes, Fluvial processes, Aeolian Processes, Coastal Processes and Igneous activities, Overview of Indian Geomorphology, Extraterrestrial landforms.

Paper -XIII
ENGINEERING GEOLOGY
Role of Engineering geologists in planning, design and construction of major man-made structural features, Site investigation and characterization, Foundation treatment, Intact Rock and Rock Mass properties, Concept, Mechanism and Significance of Rock Quality Designation (RQD,

Rock Structure Rating (RSR), rock Mass Rating (RMR), Tunneling Quality Index (Q), Tunnels and Tunneling Methods,; Causes, Factors and corrective/Preventive measures of Landslides, Earthquakes; Case histories related to Indian Civil Engineering Projects

Paper -XIV

REMOTE SENSING AND GIS

Photogeology, Concepts in Remote Sensing, Sensors, scanners, Satellites, Raster and Vector Data formats. Digital Image Processing, Errors,, Rectification, Restoration, FCC, Image Enhancement, Filtering, Rationing, classification and accuracy assessment, GIS integration and Indian Examples' Case studies, GIS, Introduction to DEM analysis, GPS.

DISCIPLINE SPECIFIC ELECTIVE

Paper - I

EXPLORATION GEOLOGY

Mineral Resources in industries, Principles of mineral exploration, Sampling, Geochemical exploration, Evaluation of sampling data, Core and non-core drilling, Core-logging Principles of reserve estimation, Factors affecting its reliability, Reserve estimation based on Regular and irregular grid patterns, statistics and error estimation.

Paper -II

EARTH AND CLIMATE

Components of the climate system: forcing, controlling factors, response, and interactions within it, Feedbacks ; Heat budget of Earth, Interactions amongst various sources of earth's heat, Atmosphere – Hydrosphere interaction, its effect on climate,

Heat transfer in ocean, Sea ice and glacial ice; Climate Change: natural vs. anthropogenic effects, Future perspectives, archives, Orbital cyclicity and climate, Monsoon: Mechanism, variation through time, its effects.

Paper -III

FUEL GEOLOGY

Definition, Origin, Basic classification of Coal, Coal Bed Methane (CBM): global and Indian scenario, Underground coal gasification, liquefaction; Chemical composition and physical properties of crude petroleum, its origin, Maturation of kerogen; Petroleum Reservoirs and Traps; Definition and general properties of Cap rocks, Plate tectonics and global distribution of hydrocarbon reserves; Gas Hydrate Nuclear Fuel.

Paper -VI

URBAN GEOLOGY

Geology in Urban Life, Constructions; Geotechnical feature and mapping for subsurface in Metropolitan areas, Building materials, Excavation and cutting in urban areas; Geology and Urban Agriculture; Geotechnical site characterization, land use mapping; Geological problems in construction of underground structures in urban areas like Tunnels, road and rail. Water lagging, Standards for various uses, Sources of contamination, disinfection and treatment of waste water, Ground water surveys and resource development; Urban wastes and Treatment, site selection for waste disposal; GIS in Urban Geology; Precaution from seismic hazard in Urban planning.

SKILL ENHANCEMENT COURSE

FIELD GEOLOGY -I
(Basic field training)
Orientation, marking location on toposheet in field; Front and Back Bearing, Concepts of map reading, Distance, height and pace approximation; Identification of rock types, structures and texture in field; Use of hand lenses, Bedding dip and strike, Litholog measurement, Reading contours and topography

FIELD GEOLOGY -II
(Geological Mapping)
Geological mapping, stratigraphic correlation, Primary and secondary structures,
Trend, plunge, Rake/Pitch, Stereoplots of linear and planar structures, Orientation analyses.

OTHERSKILL ENHANCEMENT COURSES
FIELD GEOLOGY -III
(Economic Geology field)
(CREDITS: 2)
Module I
Unit 1: Visit to any mineral deposit
Unit 2: Mode occurrence of ore, Ore mineralogy
Unit 3: Ore-Host rock interrelation
Unit 4: Ore formation process
Unit 5: Basic techniques of surveying, concept of outcrop mapping
Module 2
Unit 1: Visit to underground or open cast mine
Unit 2: Practical experience of mining methods
Unit 3: Underground mapping/ Bench mapping
Unit 4: Isopach and Isochore maps

SKILL ENHANCEMENT COURSE
FIELD GEOLOGY -IV
(Himalayan Geology field)
(CREDITS: 2)
Identification and characterization of major structural boundaries in Himalaya viz. MBT, MFT etc.
or
Field along any suitable transect of Himalayan foreland
or
Field transect in Siwalik
or
Identification of Himalayan and pre-Himalayan elements - 31 -

SKILL ENHANCEMENT COURSE
FIELD GEOLOGY -V
(Precambrian Geology field)
(CREDITS: 2)

Field transect in any Precambrian terrain
Study of craton ensemble including basic intrusive suites
Precambrian sedimentary basin
Basement-Cover relation in: a. fold belts, b. sedimentary successions

SKILL ENHANCEMENT COURSE
FIELD GEOLOGY - VI
(Visit to Engineering Project sites)
(CREDITS: 2)
Unit 1: Geological mapping of a project site (Dam sites, Tunnel alignments etc)
Unit 2: On site visit & to study various geotechnical aspects related to the project site.
Unit 3: Identification of geotechnical problems of a project site and remedial measures to be taken.
Unit 4: Identification of environmental problems of a project site and remedial measures to be taken.
Unit 5: Computation of rock mass Properties (RQD, RSR, RMR & Q) in the field.
Unit 6: Identification of potential suspected/probable sites of Natural Disaster and suggestions about corrective/preventive measures.

SKILL ENHANCEMENT COURSE
FIELD GEOLOGY -VII
(Stratigraphy and paleontology-related field)
(CREDITS: 2)
Field training along Phanerozoic basin of India
Documentation of stratigraphic details in the field
Collection of sedimentological, stratigraphic and paleontological details and their representation
Facies concept and its spatio-temporal relation (Walther's Law) and concept of facies distribution at basinal-scale
Fossils sampling techniques and their descriptions

GENERIC ELECTIVES OFFERED BY DEPARTMENT OF GEOLOGY TO STUDENTS OF OTHER COURSES

To be filledin…

DEPARTMENT OF MICROBIOLOGY

Microbiology started in 1989 in Ram LalAnand College and has vast prospects due to advancement in the fields of science and technology. It is a broad discipline course due to the

involvement of microbiology in many fields like medicine, pharmacy, dairy industry, clinical research, water industry, chemical technology and nanotechnology.

Microbiology has tremendous scope and a very bright future. Microbiology overlaps with other areas of biology, Genetics, Immunology, Virology, Cell Biology, Bacteriology, Biotechnology, and Bioinformatics.

Course Offered: B. Sc. (Honours) Microbiology

Link to Syllabus:

http://www.du.ac.in/du/uploads/Syllabus_2015/B.Sc.%20Hons.%20Microbiology.pdf

Course Outcome:

Students can pursue M Sc., or integrated M Sc. and PhD in Microbiology, Biotechnology, Biochemistry, Genetics, Plant Molecular Biology, Life Sciences from various universities.

These students can make a career in research and non-research fields.

- Microbiology related careers are found in a diverse range of employment sectors such as; healthcare organizations, environmental organizations, industry – food and drink, pharmaceuticals, toiletries, water and biotechnology companies, forensic science laboratories, publicly funded research organizations, higher education institutions etc.
- Microbiologists work in many different job areas and perform a variety of different job roles. As Bacteriologists, Industrial Microbiologists, Medical Microbiologists, Biotechnologist, Biomedical Scientist, Cell Biologists, Geneticists, Mycologists, Protozoologists, Biochemist, Immunologists, Parasitologists, Virologists, Environmental Microbiologists, Food Microbiologists

Given below is a brief description of expected learning outcomes of the various papers taught as part of this three year under-graduate program. The course structure is the same as for all Honours Courses in Science.

S No.	Name of Paper	Type of Paper	Learning Outcomes
1	Introduction to Microbiology and Microbial diversity	C-1	Introduces history and scope of microbiology. learning classification general characteristics of microbes like Algae, Fungi Protozoa and introduction about Acellular microorganisms (Virus, Viroid, Prions)
2	Bacteriology	C-2	Bacteriology- the subject offers basic knowledge of bacterial cell organization, aseptic culturing methods, growth conditions, modes of reproduction, different classification approaches in bacterial systematic and details of important taxonomic groups. By studying this paper, students become well equipped with the basic microbiological techniques of growing pure culture of bacterial cells, different staining procedures used to differentiate between the

			major groups of bacteria, along with good theoretical knowledge about bacterial systems.
3	Biochemistry	C-3	Understanding how biological molecules give rise to the processes that occur within living cells, which in turn relates greatly to the study and understanding of tissues, organs, and whole organisms. The findings of biochemistry are applied primarily in medicine, nutrition, and agriculture.
4	Virology	C-4	Learning virus structure, classification and evolution, their ways to infect and exploit host cells for reproduction, their interaction with host organism physiology and immunity, the diseases they cause, the techniques to isolate and culture them, and their use in research and therapy. This Subject considered being a subfield of microbiology or of medicine.
5	Microbial physiology and metabolism	C-5	An understanding of cell structure, growth factors, metabolism and genetic composition of microorganisms. Introduces the interrelatedness of microbiology, Biochemistry, and genetics in the context of a functioning bacteria cell.
6	Cell biology	C-6	In this subject, the students get a basic knowledge (both theoretical and practical) of the eukaryotic systems with detailed organelle structure and function – Cell wall, Cell membrane, Nucleus, Mitochondria, Chloroplast, Endoplasmic Reticulum and Golgi apparatus, process of cell signaling, cell cycle regulation, cell death by Apoptosis, development and progression of cancers along with types and uses of stem cells
7	Molecular biology	C-7	Understanding of chemical and genetic principles that determine the function of macromolecules, regulation of expression of genes within the genome, understanding of the link between basic molecular biology and a variety of human disease
8	Microbial genetics and genomics	C-8	Organization of genome and their manipulation *in vitro* as well as *in vivo*
9	Environmental Microbiology	C-9	The roles and interactions of microorganisms in the environment are discussed in this paper with applications of microbiology in environmental issues such as sustainable development, bioremediation etc. In this paper, students analyze the diversity and the various functions performed by the microflora present in soil and natural environment
10	Food and Dairy Microbiology	C-10	Understanding foods as a substrate for microorganisms; microbial spoilage of foods and their preservation; fermented foods; food borne

			diseases and methods to ensure food safety during manufacture
11	Industrial Microbiology	C-11	Studying construction and operation of different types of fermenters; types of fermentations; isolation, improvement, preservation and maintenance of industrially important strains; Microbial production of metabolites and downstream processing
12	Immunology	C-12	Immune response and its mechanism, defense systems in the body and current therapies
13	Medical Microbiology	C-13	Understanding host-pathogen interactions; Studying the Etiology, Epidemiology, Pathogenesis, Prophylaxis and Control of some human diseases caused by bacteria, viruses, protozoa and fungi; Modes of action of commonly used antimicrobial agents
14	Recombinant DNA technology	C-14	Gene organization and manipulation for therapeutic approaches
15	Bioinformatics	Discipline Specific Elective-1(DSE-1)	Organization of biological information in database and analysis tools for better understanding of DNA, RNA and Protein structures. Tools for modelling and New drug design
16	Inheritance biology	DSE-3	Understanding pedigrees and role of genetic inheritance in human disorders and syndromes
17	Microbial Biotechnology	DSE-5	Studying Applications of Biotechnology in Human Therapeutics, Agriculture, Environment, Biofuels, and Food Technology; Understanding RNAi and Intellectual Property Rights
18	Advances in Microbiology	DSE-6	Recent approaches and techniques using basic microbiology in combination with biotechnology and bioinformatics
19	Biosafety and intellectual property rights	DSE-8	Understanding patenting rights and importance of Bio -resources and IPR
20	Microbial Quality Control in food and pharmaceutical industries	Skill Based Ability Enhancement Elective-1(SE-1)	Good laboratory practices, important pathogens, food and pharma quality control methods, hazard analysis and hazardous waste management. 1. Microbiological laboratory and safe practices 2. Determining microbes in food/pharmaceutical samples 3. Pathogenic microorganisms of importance in food and water 4. HACCP for food safety and microbial standards
21	Microbial diagnostics in Health Clinics	SE-2	Learning how to collect various clinical samples; Performing Microscopy, Culturing, Serological and Molecular detection of pathogens; Studying

			Antibiotic Sensitivity patterns of Bacteria
22	Food fermentation techniques	SE-4	Food quality, preservation and large scale production techniques
23	Management of Human microbial diseases	SE-5	Understanding the underlying principles of Diagnosis and Detection of diseases
24	Microbiological analysis of Air and Water	SE-6	bioaerosols, hazard analysis and air quality monitoring in hospitals and general surroundings
25	Fundamentals of Bioinformatics	SE-7	Organization of biological information in database and analysis tools for better understanding of DNA, RNA and Protein structures. Tools for modeling and New drug design

GENERIC ELECTIVES OFFERED BY DEPARTMENT OF MICROBIOLOGY TO STUDENTS OF OTHER COURSES

Semester	Title of GE offered	Scope and syllabus Web link
Semester I	**Introduction and Scope of Microbiology**	http://www.du.ac.in/du/uploads/Syllabus_2015/B.Sc.%20Hons.%20Microbiology.pdf
Semester II	**Bacteriology and Virology**	http://www.du.ac.in/du/uploads/Syllabus_2015/B.Sc.%20Hons.%20Microbiology.pdf

DEPARTMENT OF STATISTICS

Statistics may be defined as the collection, presentation, analysis and interpretation of data. Statistics plays a vital role in almost all spheres of knowledge like Industry, Commerce, Trade, Physics, Chemistry, Economics, Mathematics, Biology, Psychology, Astronomy etc., so application of statistics is very wide. The curriculum here offers a broad treatment of statistics, focussing on specific statistical methods used in science, research and industry. The core papers include Probability theory, sample survey theory, linear model, statistical inference, algebra, Calculus, Design of Experiments, and SQC etc. It also has Operations research, Econometrics, Time Series, and Demography as optional papers.In addition to this students are given exposure to the software packages like SPSS and programming in R.The course also gives an opportunity to choose papers from other disciplines as general electives.

Course offered: B. Sc. (Honours) Statistics

Link to Syllabus:

http://www.du.ac.in/du/uploads/Syllabus_2015/18082015_B.%20Sc.%20(Hons.)%20-Statistics.pdf

Course Outcome:

With a bachelor's degree in Statistics one can go either for higher studies from DU, IASRI, ISI, IIT; PG in Operation Research and Applied Operation Research, MCA and MBA.

If one wishes to work and take up some job there are ample opportunities. Some of the important job roles are

- Data Scientist
- Academician
- Biostatistician
- Content Analyst
- Actuary in the government sector students can join Indian Statistical/ Economic Services
- Statistical investigators under Subordinate Statistical Services across the country

Given below is a brief description of expected learning outcomes of the various papers taught as part of this three year under-graduate program. The course structure is the same as for all Honours Courses in Science.

The following section needs reorganization into 14 Core papers, DSE, SEC and General Electives…

Design of Experiments (DOE): DOE is a tool to develop an experimentation strategy that maximizes learning using a minimum of resources. Extensively used by engineers and scientists involved in the improvement of manufacturing processes to maximize yield and decrease variability. It is widely used in many fields with broad application across all the natural and social sciences, to name a few: Biostatistics, Agriculture, Marketing, Software engineering. Industry etc. Course in DOE covers designs like CRD, RBD, LSD and BIBD, 2^n and 3^n Factorial designs, confounding and Fractional factorial designs.

Econometrics: Econometrics deals with the measurement of economic relationships. It is an integration of economics, mathematical economics and statistics with an objective to provide numerical values to the parameters of economic relationships. It may be pointed out that the econometric methods can be used in other areas like engineering sciences, biological sciences, medical sciences, geosciences, agricultural sciences etc. In simple words, whenever there is a need of finding the stochastic relationship in mathematical format, the econometric methods and tools help. The course covers multiple regression, multicollinearity, hetroscedasticity, autocorrelation, lag models, specification errors and use of dummy variable.

Statistical Methods: (GE): Two goals of statistical methods: a) Description of statistical facts. Such facts concern frequency distributions defined for a sample or population (or quantities derived from such distributions), b) Finding rules for relationships between variables which can be used for explanations and predictions. This paper equips students coming from diverse streams to handle data meaningfully and to ensure that data is interpreted correctly. Course covers measures of central tendency and dispersion, correlation, regression, curve fitting and theory of attributes.

Stat SEE 1: Statistical Data analysis using Software Package (SPSS) : SPSS is a comprehensive and flexible statistical analysis and data management solution. SPSS can take data from any type of file and use them to generate tabulated reports, charts, and plots of

distributions and trends, descriptive statistics, and conduct complex statistical analyses, thus most popular and widely used statistical software. This paper not only equips them with a data analysis tool but it also helps students learn and understand their statistical fundamentals better and with ease.

Survey Sampling & Indian Official Statistics

1. Survey Sampling provides the process of selecting a sample of elements from a target population to conduct survey. Most of the research work is done through Sample Survey. The students are able to know about Indian Statistical System.

2. At the completion of graduation, students are able to create powerful, cost effective sampling plans

(i) to find the optimum design,

(ii) how sample size affects cost & precision,

(iii) compare different survey sampling methods,

(iv) assess statistical power& type II errors.

Algebra

1. Algebra is one of the most important course in the field of statistical computing.

The course teaches solving of linear system of equation, relevant properties of matrix, matrix inverses & vectors.

2. The students will be conversant for their potential studies of Markov chain & stochastic process, multivariate analysis, regression analysis, Design of Experiments.

Linear Models

1. The course develop the basic theory of linear models for regression, analysis of variance & analysis of co-variance .The linear models are useful both in the planning stages of research & in the analysis of resulting data.

2. The combination of theory & applications will prepare students to explore the course & to more correctly interprete the output from linear model computer package. The matrix of the linear model is a prerequisite to work with advanced statistical tools, because most advanced tools are generalization of the linear model.

Sampling Distribution

In depth knowledge to handle large and small sample using testing of significance, Standard Error and been able to draw conclusion using p-value.

Bio Statistics

Students learn to handle clinical data, techniques and tools to obtain survival probability and knowledge of clinical drug trials. After completion they can work in health industry.

Discipline Specific Elective Papers -1(A)

Time Series Analysis

As the basis of Time series Analysis students able to predict about the changes in economy. There are following points which clear about its importance:

1. Profit of experience. 2. Safety from future

3. Utility Studies 4. Sales Forecasting

5. Budgetary Analysis 6. Stock Market Analysis

7. Yield Projections 8. Economic Forecasting

9. Census Analysis

11. Risk Analysis & Evaluation of changes.

Discipline Specific Elective Papers -2(A)

Operations Research

The **'Operations Research'** is not only confined to any specific agency like defence services but today it is widely used in all industrial organizations.

It can be used to find the best solution to any problem be it simple or complex. It is useful in every field of human activities. Thus, it attempts to resolve the conflicts of interest among the components of organization in a way that is best for the organization as a whole.

The **'Operations Research'** is very important paper to study. Those are interested to make their carrier in OR.

Main fields where OR is extensively used are

- National Planning and Budgeting
- Defence Services
- Industrial Establishment and Private Sector Units
- Research & Development and Engineering

STAT-C-201 Probability and Probability Distributions

A probability distribution is a statistical model that shows the possible outcomes of a particular event or course of action as well as the statistical likelihood of each event.

Probability distribution functions are quite important and widely used in actuarial science (insurance), engineering, physics, evolutionary biology, computer science and even social sciences such as psychiatry, economics and even medical trials.

STAT-C-401 Statistical Inference

Statistical inference: Drawing conclusions about the whole population on the basis of a sample.

Statistical inference is the process of deducing properties of an underlying probability distribution by analysis of data. Inferential statistical analysis infers properties about a population, this includes testing hypotheses and deriving estimates.

Skill Enhancement Elective

STAT-SEE-2 Statistical Data Analysis Using R (Sem III)

This course will review and expand upon core topics in probability and statistics through the study and practice of data analysis and graphical interpretation using `R'. Being an open-source and user-friendly programming language, students would be able to perform better in research as well. R is one of the most powerful and popular programming languages used by data scientists today thus it will prepare the students with current market pace.

Core Papers in Statistics

STAT-C-403 Statistical Quality Control

This course will introduce the student to the concept of quality. Competitive pressure is forcing the Organizations to look for the ways and means for improving their processes so that the Quality of the products and services improve, waste reduces and customer satisfaction increases. This course will prepare the students to work in industry/ service sector with sound knowledge of statistics.

Core Papers in Statistics

STAT-C-502 Statistical Computing Using C/C++ Programming

In this course students learn to write code in C to do statistical computing. C is a powerful, structured programming language widely used in all areas of study. This course develops the analytical as well as logical thinking of the student. It also opens the adaptability to learn any other programming language as computer is a tool to analyze data statistically.

stochastic processes

The students will be able to understand random prosesses which evolve with time. They will be able to analyse the data related to systems/processes/management operations like market research, student evolution, weather forecast, that can be modelled by a Marko Chain, study popultion growth, characterize a queue and determine the suitable levels of certain queueing systems parameters which balance the social waiting cost with the cost associated with the resources consumed.

Mathematical Analysis

Numerical Analysis: students will be able to estimate the values of a function of independent variable corresponding to some value of the dependent variable lying in between known data

points ,find its derivatives , its quadrature in situations where the exact relation between dependent and independent variable is either not known (but certain data points are known) or the relation between the two is very complex by approximating the data points by a polynomial using interpolation formulae.

Real Analysis: Students will have the knowledge of basic properties of the field of real numbers, the knowledge of the series of real numbers and convergence, Bolzano –Weirstrass theorem, Cauchy criteria, the knowledge of real functions-limits of functions and their properties, notion of continuous functions and their properties and the differentiability of real functions and related theorems

Paper: Calculus

Calculus is versatile and Valuable tool for the statistics. Calculus being used in statistics involves integrating over sections of a probability distribution. The content of this paper involves differential calculation, integral calculus and solution of different differential equations which are extremely prevalent in more advanced statistical application.

Paper: Basic course of Statistical Inference (GE-III)

Statistical Inference is a crucial part of the process of informing ourselves about the world around us. Statistical inference helps us understand our world and make sound decisions about how to act. The content of this paper is based on basic statistical methodology which is vital for industry, biosciences and others streams.

Descriptive Statistics:

A politician uses statistics advantageously to lend support and credence to his arguments while elucidating the problems he handles. A businessman, an industrial and a research worker all employ statistical methods in their work. A social scientist, modern administrator whether in public or private sector.leans on statistical data to provide a factual basis for making appropriate decision. Banks, Insurance companies and Government all have their statistics departments. Course covers measures of central tendency and dispersion, correlation, regression, curve fitting, theory of attributes and introduction to probability.

DEPARTMENT OF MATHEMATICS

Mathematics has a dual nature: It is a science and way of thinking, with its own language designed for logical discourse, and it also provides unique approaches to describing and understanding reality. Much of modern life rests on intellectual and scientific developments that are directed by mathematical equations and algorithms: space flight, computers, the Internet, weather modelling, security codes, and a lot of others. Students would familiarity with two primary aspects of mathematical thinking after graduating in this course.

The first aspect is mathematics as a body of knowledge. It is concerned with such issues as enumeration and computation, quantifying change, geometrical figures, shape, and symmetry. It deals with these topics via precise, unambiguous symbolic language. Students would understand some of the aesthetically beautiful ideas and their history that have implications so powerful that science and technology would be impossible without this underpinning—selected from topics such as number theory, geometric analysis, calculus, probability and statistics, Combinatorics, and symbolic logic, among others.

The second aspect of mathematical thinking is its broad applicability, its "unreasonable effectiveness" in the natural, biological and engineering sciences, as well in many of the social sciences and psychology. The essential concept is "mathematical modelling." Using mathematical ideas many problems that arise in the everyday world can be abstracted and expressed as mathematical problems. The solutions, often obtained via scientific computation, are then applied to the original problem, and their conformance to reality checked. These elegant solutions to applied problems are necessary for a deeper understanding of the forces that continuously transform our world. The hands-on experiment of mathematical software ***MATHEMATICA***, ***MATLAB, R-Software*** and ***TORA*** will help gain a clear understanding of the subject.

Course offered: B.Sc. (Honours) Mathematics

Link to Syllabus:

http://www.du.ac.in/du/uploads/Syllabus_2015/B.Sc.%20Hons.%20Mathematics.pdf

Course Outcome:

After completing graduation in mathematics, there is a wide array of career prospects in mathematics field. All the highest paying jobs are directly or indirectly related with mathematics. Mathematics jobs are available in both government as well as private organizations. In the government sector, mathematics graduates may consumed in government departments, semi-governments, PSUs, research organizations, technical branches, banking sectors, colleges and universities. Besides academics jobs, trained mathematicians are also engaged at good remuneration and package in Indian Space Research Organisation (ISRO), Defence Research and Development Organisation (DRDO), National Aeronautic Limited (NAL) and Society for Electronic Transaction and Security (SETS). Financial Mathematics is another booming area where student can get one of the best packages in the industry. IT giants like IBM and Microsoft hired candidates as scientists where salary is beyond your expectation.

A. Expected Learning Outcomes for Core Courses

1. *C 1: Calculus*

Calculus is essential for many areas of science and engineering. Both make heavy use of mathematical functions to describe and predict physical phenomena that are subject to continuous change, and this requires the use of calculus. This course provides a comprehensive survey of differential and integral calculus concepts, including limits, derivative and integral computation, linearization, Riemann sums, the fundamental theorem of calculus, and differential equations. Content is presented in 5 units and covers various applications, including graph analysis, linear motion, average value, area, volume, and growth and decay models. In this course students use an online textbook, which supplements the instruction they receive and provides additional opportunities to practice using the content they've learned. Students will learn to use an embedded graphing calculator (**CASIO 991 ES**) and Mathematical Software **MATHEMATICA** for their Practical understanding of the topic.

2. *C 2 :Algebra*

Becoming an algebra expert opens the doors to some of today's most trendy (and well-paid) careers. From computer science to medicine, algebra serves as a foundational skill. Understanding algebra also puts students on track for college success, no matter what major they choose. The content of the course is well defined and give a glimpse of Complex

Number, Linear Algebra, Analytical Geometry and Applied Algebra. Content is presented in 5 units and covers various applications, including Polar representation of complex numbers, nth roots of unity, De Moivre's theorem for rational indices and its applications. Equivalence relations, Division algorithm, Divisibility and Euclidean algorithm, Congruence relation between integers, Principles of Mathematical Induction, Systems of linear equations, row reduction and echelon forms, applications of linear systems, linear independence. Subspaces of R^n, dimension, rank, Eigen values, Eigen Vectors and Characteristic Equation of a matrix. The scope of this learning experience is to study basic mathematical concepts required for adult learners at a college or university level. Learners will become proficient at solving linear and quadratic equations, graphing linear and quadratic equations, functions, exponents and logarithms, and applying these concepts to real world problems.

3. *C 3: Real Analysis*

The course of Real Analysis is designed in such a way that students should understand mathematical analysis dealing with the real numbers and real valued functions of a real variable. In particular, it deals with the analytic properties of real functions and sequences, including convergence and limits of sequences of real numbers, the calculus of the real numbers, and continuity, smoothness and related properties of real-valued functions. The curriculum is divided into five units.

4. *C 4: Differential Equation*

A differential equation is a mathematical equation that relates some function with its derivatives. In applications, the functions usually represent physical quantities, the derivatives represent their rates of change, and the equation defines a relationship between the two. Because such relations are extremely common, differential equations play a prominent role in many disciplines including engineering, physics, economics, and biology.

The content covered in the widest sense in four units: ordinary and partial differential equations, functional and abstract differential equations, dynamical model including predator-prey model and its analysis, competing species and its analysis, epidemic model of influenza and its analysis, battle model and its analysis,integro-differential equations etc. The topics include the study of asymptotic behavior, stability, oscillations, periodic solutions, bifurcations and applications to ecology, population, biology, and engineering sciences. The student will design and analyse the

outcomes of above model and predict the result through mathematical software Mathematica/Matlab.

5. *C 5 :Theory of Real Functions*

The course covered in 7units that deals with, Limits of functions (epsilon-delta approach), Continuity of functions ,Uniform continuity, Rolle's theorem, Mean value theorem, intermediate value property of derivatives - Darboux's theorem Taylor's series &Maclaurin's series. The students will be able to understand the behavior of sequence and series, its convergence and divergence property and the application of it in real world.

6. *C 6: Group Theory-I*

The subject gives the idea about the general structure of elements occur in our society. The types of group they formed and their properties, including Dihedral groups, permutation groups and quaternion groups , Subgroups, centralizer, normalizer, center of a group, product of two subgroups. Properties of cyclic groups, classification of subgroups of cyclic groups, alternating group, etc. The topics also covered Lagrange's theorem and consequences including Fermat's Little theorem, normal subgroups, factor groups, Cauchy's theorem for finite abelian groups. It also discuss the homeomorphisms, properties of homeomorphisms, properties of isomorphism. The entire topic is covered in 3units

7. *C 7: Multivariate Calculus (including practical)*

The students get to learn the advanced calculus that described in 4 units, which includes homeomorphisms, properties of homeomorphisms, Cayley's theorem, properties of isomorphism, Lagrange multipliers, constrained optimization problems, vector field, divergence and curl Double integration over rectangular region, double integration over nonrectangular region. Double integrals in polar co-ordinates, Triple integrals, Triple integral over a parallelepiped and solid regions. Volume by triple integrals, cylindrical and spherical co-ordinates. Line integrals, Applications of line integrals: Mass and Work. Fundamental theorem for line integrals, conservative vector fields, independence of path. Green's theorem, surface integrals, integrals over parametrically defined surfaces. Stokes' theorem, The Divergence theorem are also being taught in the subject.

8. *C8: Partial Differential Equations (including practical)*

The subject emphasize on the use of PDEs whenever multivariate functions occur in mathematical modeling. The student get hand on experience on mathematical software about mathematical modeling of vibrating string, vibrating membrane, conduction of heat in solids, gravitational potential, conservation laws and Burger's equations and able to analyse the use and application in physical, biological and in engineering sciences. The theoretical knowledge of classification of second order PDE, reduction to canonical forms, equations with constant coefficients, general solution. finite strings with fixed ends, non-homogeneous wave equation, Riemann problem, Goursat problem, spherical and cylindrical wave equation, vibrating string problem, existence and uniqueness of solution of vibrating string problem, heat conduction problem, existence and uniqueness of solution of heat conduction problem, Laplace and beam equation, non-homogeneous problem is also being taught.

9. *C9: Riemann Integration & Series of functions*

This gives students to understand the classical approach of integration using Riemannian sum. The topic covered in five units, which includes Riemann conditions of integrability. Riemann sum and definition of Riemann integral through Riemann sums; Convergence of Beta and Gamma functions, Limit superior and Limit inferior. The subject also describes the Power series, radius of convergence, Cauchy Hadamard Theorem, Differentiation and integration of power series; Abel's Theorem; Weierstrass Approximation Theorem, which is of great help in higher mathematics.

10. *C10: Ring Theory & Linear Algebra-I*

The classical approach to understand the higher mathematics is prescribed in this topic through ring theory. The subject emphasis on rings, properties of rings, subrings, integral domains and fields, characteristic of a ring. Ideals, ideal generated by a subset of a ring, factor rings, operations on ideals, prime and maximal ideals. Ring homeomorphisms, its properties, Isomorphism theorems. In the second part it provide information about higher Linear Algebra, that includes Vector spaces, subspaces, algebra of subspaces, quotient spaces, linear combination of vectors, linear span, linear independence, basis and dimension, dimension of subspaces. Linear transformations, null space, range, rank and nullity of a linear transformation, matrix representation of a linear transformation, algebra of linear transformations.

11. C11: Metric Spaces

This topic covered the analysis of pure mathematics, which is prescribed in five units, Metric spaces Continuous mappings, sequential criterion and other characterizations of continuity, Uniform continuity, Homeomorphism, Contraction mappings, Banach Fixed point Theorem. Connectedness, Compactness are the area to be covered in this subject.

12. C12: Group Theory-II

This section continues with idea of pure mathematics through classical approach. It deals with automorphism, inner automorphism, Fundamental Theorem of finite abelian groups, Group actions, stabilizers and kernels, permutation representation associated with a given group action. It also includes applications of group actions: Generalized Cayley's theorem, Index theorem. Groups acting on themselves by conjugation, class equation and consequences, conjugacy in Sn, *p*-groups, Sylow's theorems and consequences, Cauchy's theorem, Simplicity of An for $n \geq 5$, non-simplicity tests.

13. C13: Complex Analysis

The classical complex analysis is discussed in this section, which is covered in six units. Analytic functions, examples of analytic functions, exponential function, Logarithmic function, trigonometric function, derivatives of functions, definite integrals of functions.c-r equation, Contours, Contour integrals and its examples, upper bounds for moduli of contour integrals. Laurent series and its examples, absolute and uniform convergence of power series, is covered under this topic. Students also get a hand on experience of the above properties through mathematical software.

14. C14: Ring Theory and Linear Algebra-II

Higher order mathematics is continue in this section, which provides information about Laurent series, absolute and uniform convergence of power series, uniqueness Bessel's inequality, the adjoint of a linear operator, Least Squares Approximation, minimal solutions to systems of linear equations, Normal and self-adjoint operators, Orthogonal projections and Spectral theorem.

B. Discipline Specific Electives

I. DSE: Cryptography and Network Security

Cryptography and encryption are most critical components of network security. Cryptography can be used to implement confidentiality, integrity, authentication, and nonrepudiation. Network security is concerned with the protection of network resources against alteration, destruction and unauthorized use. The course contain covers the topic required to undersatand the importance of Network Security using Cryptography. The various cryptographic methods discussed are cipher model, Classical encryption techniques- Substitution and transposition ciphers, caesar cipher, Playfair cipher. Block cipher Principles, Shannon theory of diffusion and confusion, Data encryption standard, Chinese Remainder theorem, Advanced Encryption Standard(AES), Stream ciphers, RSA algorithm and security of RSA, elliptic curve cryptography, cryptographic Hash functions, Secure Hash algorithm, SHA-3. The learner will understand the safety and security of communication and main goal is user authentication, data authentication such as integrity and authentication, non-repudiation of origin, and confidentiality. The topic also covers digital signature, elgamal signature, digital signature standards, digital signature algorithm and E-mail security: Pretty Good Privacy (PGP).

II. DSE: Discrete Mathematics

Computer Science, Graph theory and Boolean algebra are based on discrete mathematics. The content provides deep information about properties of modular and distributive lattices, Boolean algebras, Boolean polynomials, Quinn-McCluskey method, Karnaugh diagrams, switching circuits , basic properties of graphs, pseudo graphs, complete graphs, bipartite graphs, isomorphism of graphs, paths and circuits, Eulerian circuits, Hamiltonian cycles, the adjacency matrix, weighted graph, travelling salesman's problem, shortest path, Dijkstra's algorithm, Floyd-Warshall algorithm covered under three units.

III. DSE: Probability theory & Statistics

Probability and statistics were the only well-founded theories of uncertainty for a long time. Statistics is about gaining information from sets of data. Sometimes you want to represent a lot of complicated information from a large data set in a way that is easily understood. This is called *descriptive statistics*. Statistics is intimately linked to probability theory. students can use statistics to work out the probability, the chance that a certain event will occur. This course provides a comprehensive survey of *descriptive statistics* and *Probability*concepts, including

discrete and continuous random variables, cumulative distribution function, probability mass/density functions, mathematical expectation, moments, moment generating function, characteristic function, marginal and conditional distributions, expectation. Content is presented in 3 units and covers various applications, including Chebyshev's inequality, Central Limit theorem, Markov Chains, Chapman-Kolmogorov equations, classification of states etc. Students will learn to use an embedded graphing calculator (CASIO 991 ES) and Mathematical/Statistical Software MS-EXCEL AND SPSS for their Practical understanding of the topic.

IV. DSE: Linear Programming and Theory of Games

Life is full of conflicts and competition. The examples of conflicts include parlour games, military battles, political campaigns, advertising and marketing campaigns by competing business firms etc. There is a great scope for economists, statisticians, administrators and the technicians working as a team to solve problems of defense by using the OR approach. Besides this, OR is useful in the various other important fields like: 1. Agriculture 2. Finance 3.Industry 4.Marketing and Personnel management 5.Production Management 6.Research and Development etc. The content is divided in four units and covers the topic including Introduction to linear programming problem, simplex method, optimality and unboundedness, the simplex algorithm, two-phase method, Big-M method and their comparison. Duality, economic interpretation of the dual. Transportation problem, assignment problem and its mathematical formulation, Hungarian method for solving assignment problem and Game theory: formulation of two person zero sum games, mixed strategies, graphical solution procedure, and linear programming solution of games.

V. DSE :Numerical Analysis

Problems of the real world have measurement errors that propagate step by step and started dominating the desired result. The iterative process in Numerical analysis aims to reduce the error as much as possible through various technique/algorithm. Most simulators of physical phenomena Maxwell's equations (electromagnetic phenomena), Navier-Stokes equations (fluid mechanics), Schrödinger's equation (quantum mechanics), Fourier equations (heat conduction), etc are using numerical methods rather than closed-form solutions.The prescribed course curriculum is divided into four units and help students, 1) to get to know how fast errors cause problems 2) to find better algorithms that cause less errors. They will learn the different method

to generate solutions of mathematical modelling using Newton-Raphson Method, Secant Method, Iterative Method, Gauss-Siedel Method, trapezoidal, Newton-cotes Method, Runge-Kutta Method etc. that minimizes the error while computing. Students will learn to use an embedded graphing calculator (**CASIO 991 ES**) and Mathematical Software **TORA** for their Practical understanding of the topic.

C. Skill Enhancement Courses

I. SEC_1 [LATEX]

The Skill Enhancement Courses are skill-based and are aimed at providing hands-on-training, competencies, skills, etc. through ***the tools of modern Mathematics***. One such important tool is LATEX, which is an easy-to-use version of TEX designed by Leslie Lamport. LATEX files are text files, which we can edit with simple text editors such as Notepad or Notepad++. There are dedicated editor for L ATEX files.

While it is possible to create beautiful mathematical documents with other software, no other program has the ubiquity of LATEX for mathematical writing. It can be used to type assignments, research articles and books involving equations, in more convenient ways than any other available software. This course provides comprehensive information including graphic design using PS-tricks, beamer presentation formats etc. The hands on training on LATEX will open the door for the students to be a freelancer or can associate themselves with publishing companies, as many of the reputed publishing companies require LATEX expert and they also outsource the assignment for freelancers.

II. SEC_2 [COMPUTER ALGEBRA SYSTEM]

A computer algebra system is a program with which students can perform calculations, evaluate functions, create graphics, and develop their own programs. The key feature of computer algebra systems is the ability to manipulate expressions symbolically. Typical manipulations possible in a CAS include simplifying expressions, factoring, taking derivatives, computing integrals (symbolically and numerically), and solving systems of equations. The course curriculum is designed in such a way that enhance their skill in Mathematical/Statistical Software like, **MATHEMATICA**, created by Stephen Wolfram, **MAPLE**, created by Waterloo Maple, **MAXIMA**, **R-software** and **MATLAB**. The exposure of such software can help them to work

as an independent analyst, financial assistant, survey analyst or can be easily associate themselves with other firms.

III. SEC_3 [R-Software]
IV. SEC_4 [Transportation and Game Theory]

GENERIC ELECTIVES OFFERED BY DEPARTMENT OF MATHEMATICS TO STUDENTS OF OTHER COURSES

I. GE_1a: Calculus
II. GE_1b: Analytic Geometry and Theory of Equations
III. GE_2a: Linear Algebra
IV. GE_2b: Discrete Mathematics
V. GE_3a: Differential Equation
VI. GE_3b: Linear Programming and Theory of Games
VII. GE_4a: Numerical Methods
VIII. GE_4B: Elements of Analysis

Mathematics Papers for Students of BA(Program)

I. Paper _1: Calculus
II. Paper _2: Algebra
III. Paper _3: Analytic Geometry and Applied Algebra :-The subject aims to impart analytical knowledge of geometry and application of network analysis in real world problem to the students of BA(P). The content is prescribed in three units and covers various application of conics, including graphing of conics, 2-D &3-D graphing of sphere, cylinders, mathematical modelling of Matching Job, Network reliability, Street Surveillance, Scheduling Meetings, Spelling Checker etc.
IV. Paper _4: Analysis
V. Paper _5: Differential Equations
VI. Paper _1: Numerical Analysis

DEPARTMENT OF COMMERCE

The Department of Commerce at RLA College has a computer laboratory exclusively maintained for commerce students. This computer lab is well-equipped with internet facility, LCD projectors etc. The college library has a well-stocked Commerce section containing oversix thousand books, several journals and magazines for enrichment of knowledge of students and faculty. The department has well-qualified and experienced faculty.

Courses Offered:

1.B Com (Honours)

Link to Syllabus:

http://www.du.ac.in/du/uploads/Syllabus_2015/B.Com%20(H).pdf

The B Com (Honours) course is one of the most sought after courses of the University of Delhi as is evident from the spiralling cut-offs. It attracts some of the brightest minds brimming with innovative ideas and enthusiasm.

This course aims at providing comprehensive insight into finance, banking, law, accounting, taxation and management, which play an important role in today's dynamics business environment. It provides a good knowledge of business and develops entrepreneurial skills. On successful completion of B Com (Honours) and B Com, aspirants can apply for jobs relating to accounting, finance, marketing banking or pursue higher education such as M.Com, CA, CMA,CS etc.

Given below is a brief description of expected learning outcomes of the various papers taught as part of this three year under-graduate program

Sr. No.	Course Name	Paper Name	Paper Type	Learning Outcomes of Papers
Semester I				
1	C-1	Financial Accounting	BCH1.2	To provide basic theory,concepts and practice of financial accounting and to enable students to understand information contained in the published financial statements of companies and organisation.
2	C-2	Business Laws	BCH1.3	To provide knowledge with case laws of The Indian Contract Act, The Sale of Goods Act The Limited Liability Partnership Act, and The Information Technology Act

3	GE	Insurance and Risk Management		Helps in identifying, analysing and managing various types of risks and helpsstudents to understand principles of insurance and its usefulness in business alongwith its regulatory framework.
Semester II				
4	C-3	Corporate Accounting	BCH2.2	Preparation and Presentation of Companies Financial Accounts and enhance ability of students to understand the same in better manner.
5	C-4	Corporate Laws	BCH2.3	Formation, Regulation and working of Companies according to Companies Act 2013 and Depositories Act 1996
6	GE	Investing in Stock Markets		Basic skills to operate and analyse in stock market.
Semester III				
7	C-5	Human Resource Management	BCH 3.1	To acquaint students with the techniques and principles to manage human resources of an organisation.
8	C-6	Income Tax Law and Practice	BCH 3.2	To provide knowledge of Income tax and also practical knowledge of filing Income tax return ITR-1, ITR-2 and TDS Return
9	C-7	Management Principles and Applications	BCH 3.3	To acquaint with basic management concept, principles and practices.
10	SEC-1	E-Commerce	BCH 3.5	This subject enable student to become familiar with the mechanism for conductingbusiness transactions through electronic means.
11	GE	Project Management		This subject enables the student to evolve a suitable framework for thepreparation,appraisal,monitoring and control and hedge-risk of industrial projects.
Semester IV				
12	C-8	Cost Accounting	BCH 4.1	It helps in ascertaining the costing profit or loss of any activity on an objective basis by matching cost with the revenue of the activity.
13	C-9	Business Mathematics	BCH 4.2	To prepares students for lifelong learning and successful conduct usingtheir mathematical skills.It emphasises on using mathematical tools in differenteconomic situation.
14	C-10	Computer Applications in Business	BCH 4.3	To provide students with the knowledge and skills needed inachieving proficiency in the use of software packages in the areas of word-processing,spread-sheets,databases,internet and

				multimedia software.
15	SEC-2	E –Filing of Returns	BC H 4.5	E Filing of Income tax Returns ITR-1,ITR-2, ITR-3, ITR-4.
Semester V				
16	C-11	Principle of Marketing	BCH 5.1	To develop not only personal skills but also presentation skills, knowledge of concepts,principles, tools and techniques of marketing.
17	C-12	Fundamental of Financial Management	BCH 5.2	It provides framework for optimum financial decision, making designing a method of operating the internal investment and financing of a firm.
18a	DSE-1	Management Accounting	BCH 5.3	Use of Standard Costing, Marginal costing and budgetary control techniques for managerial planning,control and decision making.
18b	DSE-1	Advertising	BCH 5.3	To familiarize the students with the basic concepts tools and techniques of advertising used in marketing as well as how to create and manage media campaigns the course includes training in legal ethical and social responsibility of advertisers and ways to engage and communicate with clients and target audience.
19a	DSE-2	Corporate Tax Planning	BCH 5.4	To provide knowledge of Corporate tax planning and its impact on decision making and to maximize after tax return on business operations and giving corporations a competitive edge over other entities.
19b	DSE-2	Organisation Behaviour	BCH 5.4	It develops a theoretical understanding among students about the structure and behaviour of organisation as it develops overtime.it makes them capable of realizing competitiveness of firms.
Semester VI				
20	C-13	Auditing and Corporate Governance	BCH 6.1	It provides students with knowledge of auditing principles,procedures and techniques in accordance with current legal requirements and professional standards.
21	C-14	Indirect Tax Laws	BCH 6.2	it provides basic knowledge and equip students with application of principles and provisions of goods and service tax and custom laws
22a	DSE-3	Fundamental of Investment	BCH 6.3	It helps in understanding of investments choices and risks and return associated with different products and also provides the knowledge of

				various investment strategies
22b	DSE-3	Industrial Relation and Labour Laws	BCH 6.3	Industrial relation is concerned with the relationship between management and workers and the role of regulatory mechanism in resolving industrial dispute
23	DSE-4	Compensation Management	BCH 6.4	It focuses on employees' efforts,attracting quality employees,retaining top performers and motivating your employees.

2. The B Com Program

The B Com program is an undergraduate course designed to inculcate business acumen in students. Unlike the Honours course which enables students to specialize in specific subject, the B Com program is much more broad-based and provides an overview of all subjects taught in the Honours course.

Link to Syllabus:

http://www.du.ac.in/du/uploads/Syllabus_2015/B.Com.pdf

Given below is a brief description of expected learning outcomes of the various papers taught as part of this three year under-graduate program. A similar course structure is shared by the B Com and BA programs offered by colleges affiliated to the University of Delhi.

Sr. No.	Course Name	Paper Name	Paper No.	Outcome of Paper
Semester I				
1	AECC-1	Environmental Studies	BC 1.1	
2	Core Course (DSC-1)	Financial Accounting	BC1.2	To provide the basic theory,concepts and practice of financialaccounting and to enable students to understand information

				contained in the published financial statements of companies and organisation.
3	Core Course (DSC-2)	Business Organisation and Management	BC 1.3	To introduces the study of general organisation theory and behaviour of groups and individual with in organisation and their fundamentals of management
4	Language-1	English Language	BC 1.4	
Semester II				
5	AECC-2	English/Hindi/Modern Indian Language	BC 2.1	
6	Core Course (DSE-3)	Business Laws	BC2.2	To provide knowledge with case laws of The Indian Contract Act, The Sale of Goods Act The Limited Liability Partnership Act, and The Information Technology Act
7	Core Course (DSE-4)	Business Mathematics and Statistics	BC 2.3	It prepares students for lifelong learning and successful conduct using their mathematical and statistical skills.
8	Language-2	Hindi/Modern Indian Language	BC 2.4	
Semester III				
9	DSC-5	Company Law	BC 3.1	Formation, Regulation and working of Companies according to Companies Act 2013 and Depositories Act 1996
10	DSC-6	Income Tax Law and Practice	BC 3.2	To provide knowledge of Income tax and also practical knowledge of filing Inome tax return ITR-1, ITR-2 and TDS Return
11	Language-3	Hindi/Modern Indian Language	BC 3.3	
12	Ability Enhancement Elective Course-1	Computer Application in Business	BC 3.4 (a)	to provide students with the knowledge and skills needed in achieving proficiency in the use of

	(Skill Based-AEEC-1)			software packages in the areas of word processing,spread-sheets,databases,internet and multimedia software.
Semester IV				
13	Language-4	Business Communication(English/Hindi)	BC 4.1	
14	Core Course	Corporate Accounting	BC 4.2	Preparation and Presentation of Companies Financial Accounts and enhance ability of students to understand the same in better manner.
15	Core Course	Cost Accounting	BC 4.3	It helps in ascertaining the costing profit or loss of any activity on an objective basis by matching cost with the revenue of the activity.
16	Ability Enhancement Elective Course -2 (Skill Based-AEEC-2)	E Commerce	BC 4.4 (a)	This subject enable student to become familiar with the mechanism for conducting business transactions through electronic means
17	Ability Enhancement Elective Course -2 (Skill Based-AEEC-2)	Investing in Stock Markets	BC 4.4 (b)	It provides students basic skills to operate in stock market and the ways of investing in it.
Semester V				
18	Discipline Specific Elective (DSE-1)	Human Resource Management	BC 5.1 (a)	To acquaint students with the techniques and principles to manage human resources of an organisation.
19	DSE-1	Financial Reporting and Analysis	BC 5.1 (d)	To provides information about the financial position performance and changes in financial position of a company that is useful to a wide range of users in making economic decisions.

20	DSE-2	Fundamentals of Financial Management	BC 5.2 (a)	It provides a framework for optimum financial decision-making, designing a method of operating the internal investment and financing of a firm.
21	DSE-2	Indirect Tax Laws	BC 5.2 (b)	It provides basic knowledge and equip students with application of principles and provisions of goods and service tax and custom laws
22	Skill Based AEEC-3	Advertising	BC 5.3 (b)	To familiarize the students with the basic concepts tools and techniques of advertising used in marketing as well as how to create and manage media campaigns the course includes training in legal ethical and social responsibility of advertisers and ways to engage and communicate with clients and target audience.
23	General Elective (GE-1)	Principles of Microeconomics	BC 5.4 (a)	A beginner's course in Microeconomics. Helpful in the understanding of economic reports and events and for competitive examinations.
Semester VI				
24	DSE-3	Human Resource Management	BC 6.1(a)	To acquaint students with the techniques and principles to manage human resources of an organisation
25	DSE-3	Financial Reporting and Analysis	BC 6.1(d)	To have information about the financial position performance and changes in financial position of a company that is useful to a wide range of users in making economic decisions.
26	DSE-4	Fundamental of Financial Management	BC 6.2(a)	It provides framework for optimum financial decision

				making.they are concerned with designing a method of operating the internal investment and financing of a firm.
27	DSE-4	Indirect Tax Laws	BC6.2(c)	it provides basic knowledge and equip students with application of principles and provisions of goods and service tax and custom laws.
28	AEEC-4	Advertising	BC6.3(b)	To acquaint basic concepts tools and techniques of advertising used in marketing as well as how to create and manage media campaigns the course includes training in legal ethical and social responsibility of advertisers and ways to engage and communicate with clients and target audience.

GENERIC ELECTIVES OFFERED BY THE DEPARTMENT OF COMMERCE TO NON COMMERCE STUDENTS:

Semester	Title of GE offered	Scope and syllabus Web link
Semester-1	Insurance and Risk Management	http://www.du.ac.in/du/uploads/Syllabus_2015/B.Com%20(H).pdf
Semester-2	Investing in Stock Markets	http://www.du.ac.in/du/uploads/Syllabus_2015/B.Com%20(H).pdf

DEPARTMENT OF ENGLISH

Course Offered: BA (Honours) English

Link to Syllabus:
http://www.du.ac.in/du/uploads/Syllabus_2015/B.A.%20Hons.%20English.pdf

Course Outcome:

English is considered a window to the world. A window not only in terms of communication skills, economic growth and scientific discoveries but also in terms of best literature which emerges all over the world. English Honours offers the window to young students. The course is demanding one and requires lot of efforts to grasp the issues raised through various genres under the umbrella of English literature. The Course includes literature written in English all over the world for instance American, African, Indian and the emerging like Dalit Literature and Women's Writings. Under Choice Based Credit System (CBCS) English Honours students study 14 compulsory core papers which make them familiar with various developments in literature right from the beginning of literary studies to postcolonial studies.

After the completion of the course the students must have an understanding of various movements in literature, literary criticism and approaches which are used to interpret literary text. The Course helps the students to develop the skill of self-expression. It opens a wide-ranging career opportunities in fields of social sciences, humanities, journalism, publishing, script writing and editing.

Given below is a brief description of expected learning outcomes of the various papers taught as part of this three year under-graduate program. The course structure is the same as for all Honours Courses in Arts.

Semester 1

1. **Indian Classical Literature:** The paper aims to introduce the students to Sanskrit and Tamil classical texts. Initiates engagement with Indian aesthetic theory and discussions on different genres of classical literature and their scope.
2. **European Classical Literature:** Aims to introduce beginnings of Western literature and theory written during the Greco-Roman period. The paper also offers a primary acquaintance with the origin of western philosophical thought.

Semester 2

3. **Indian Writing in English:** The paper focuses on the modern Indian writings that depict and examine the Indian consciousness written in the language which was a colonial legacy,that is, English.
4. **British Poetry and Drama: 14th to 17th Century:** The paper introduces students with renaissance literature in England and traces the evolution through the Jacobean and the Commonwealth period.

Semester 3

5. **American Literature:** The paper includes major creative writers and theoreticians who contributed to the development and evolution of American literature. The paper hence offers a preliminary introduction to American Literature and its development.
6. **Popular Literature:** The paper through various popular texts ranging from romantic to detective fiction tries to engage students in a critical dialogue with the politics
7. **British Poetry and Drama 17th and 18th Century:** Introduction to Restoration drama and Neoclassical Poetry.

Semester 4

8. **British Literature: 18th Century:** The paper deals with the Enlightenment Period that marked rise of prose writing, beginning of the genre of novel in England, and a gradual movement towards the Romantic movement.
9. **British Romantic Literature:** This paper goes into a detailed study of the Romantic Movement in the history of English Literature. Through the works of Wordsworth and Coleridge it studies the centrality of imagination and primacy of Nature in development of human character.
10. **British Literature 19th Century**: Known as the Victorian Period the age sees rise in the popularity of Novel as a genre in its realistic form. Most of the narratives deal with the socio-economic changes like Industrialization.

Semester 5

11. **Women's Writing:** This paper involves a critical engagement with the issues of gender and women's writing. It traces the development of women's movement through their writing.
12. **British Literature - The Early Twentieth Century:** This paper goes into detail to trace the essential tenets of the early modernist movements through the writings of Yeats, Eliot and others.

Semester 6

13. **Modern European Drama:** The paper introduces the students to developments in the field of theatre and performance from 19th century realistic theatre of Ibsen to post-modernist avant-garde theatre of Genet.
14. **Postcolonial Literatures:** The paper includes narratives of resistance and re-interpretation of histories from the former colonies of Britain. These narratives usually are subversive and radical in nature.

Discipline Specific Electives

1. **Modern Indian Writing in English Translation:** It introduces Indian regional literatures through English translation and dwells upon the problems of translation.
2. **Literature of the Indian Diaspora:** This paper is a study of the different trends of diasporic Indian writing across the globe and deals with issues of identity in marginalized immigrant communities.
3. **19th Century European Realism:** This paper is about the study of realism in European novels of the 19th century. The writings of Flaubert, Dostoyevsky, etc. are the texts that are read and discussed.
4. **Literary Criticism:** The history of literary criticism in the Western world especially Wordsworth, Coleridge, Richards etc.
5. **Partition Literature:** Deals with the traumas and violent experiences of Partition in the history of India from different perspectives. The subversive narratives interrogate the logicality of partition and other political decisions.
6. **World Literature:** The paper provides the students an opportunity to get a glimpse of the diverse and varied literature produced around the globe under different socio-cultural contexts.
7. **Understanding Dalit Literature:** The paper critically looks into and evaluates the caste hierarchy that permeates the Indian social system. It records the voices of resistance to the deeply dehumanizing and exploitative system and traces the development of Dalit movement in the Indian history.
8. **Autobiography:** The paper includes several autobiographies of well-known writers and readers. It engages with the issues like the relationship between the self and the society, role of memory and autobiography as a tool of resistance narrative.

GENERIC ELECTIVES OFFERED BY DEPARTMENT OF ENGLISH TO STUDENTS OF OTHER COURSES

1. **Text and Performance:** Introduction to the theories of performance and a historical overview of Western and Indian Theater.
2. **Women and Empowerment:** This paper is an introduction to the social construction of gender and the history of women's movement in India.

3. **Culture and Theory:** The paper aims to increase awareness of the students regarding contemporary trends in Indian culture, by providing them with theoretical and critical tools of evaluating the same.
4. **Readings on Indian Diversities and Literary Movements:** Provides an overview of plurality of Indian culture, language, and literatures. A course that reflects the heterogeneous and multifaceted reality of Indian-ness.

DEPARTMENT OF HINDI & PATRAKARITA EVAM JANSANCHAR

The Department of Hindi has eminently qualified and experienced faculty.

There is a dedicated Media lab with a video, audio, computer and internet facility.The Department publishes an annual newsletter under the banner of Hindi PatrakaritaEvamJansanchar. Students undertake internship at different media schools during the summer vacations. During the session they take part in educative TV programmes on channels like IBN7 and TV Today. Prominent journalists and faculty from other Mass Communication Institutes are invited to give lecture in the interactive workshops for the students.

Courses Offered:

1. **BA (Honours) Hindi**
2. **BA (Honours) Hindi Journalism and Mass Communication (PatrakaritaEvam Jan Sanchar)**
3. **MA Hindi**

1. BA (Honours) Hindi

Link to syllabus:

http://www.du.ac.in/du/uploads/Syllabus_2015/B.A.%20Hons.%20Hindi.pdf

Course Outcome:

Hindi is the mother tongue of approximately 41 percent of India's population. It has a history of more than 1000 years and a rich literary tradition. Hindi played a pivotal role in national integration during India's struggle for freedom from the British regime. After the independence Hindi was declared as the official languageof the republic of India. We can say that Hindi is a language of national character. The honors course in Hindi language and literature offered by the department has the right mix of practical and theoretical knowledge of the subject. After completing the course graduate students can get employment in government sector as translator, RajBhashaadhikaari, Teacher, language expert in Indian embassy all over the world. In media

graduate students can work as script writer, editor, anchor, Radio Jockey, reporter, feature writer, PR executive etc. Students can also pursue a career in higher education and can work as researcher and teachers. Students can also go for UPSC as Hindi is one of the subject in Main IAS exam.

Given below is a brief description of expected learning outcomes of the various papers taught as part of this three year under-graduate program. The course structure is the same as for all Honours Courses in Arts.
Hindi Core (HCC)

Semester - 1
Paper No. - 1 'HindiBhashaAurUsakiLipikaItihas'
The main objective of this paper is to give information about the history of Hindi language, its regional expansion and the various dimensions of Devanagari script.

Paper No. - 2 HindiKavita (AdikaleenevamBhaktikaleenkavya)
In Hindi literature, poetry has been the mainstay of the period from Aadikaal to Bhaktikaal. In this paper - 'Hindi Kavita (AdikaleenevamBhaktikaleenkavya)' the student will study the poetry prior to Ritikaal. Through its study, the student will be able to know the different conditions of society at that time. In the literature of this era, the political, social, and religious conditions have been expressed clearly or in symbols.

Name of the paper - MIL Comm., 'Hindi Bhashaaursampreshan'
'Hindi BhashaAurSampreshan' is a course of Hindi language. The aim of this paper is to enhance the work efficiency and linguistic skills of students.This course is definitely useful. Be it commercial, academic, social or political -in every sphere of life today, efficient communication is the basis of success. Its significance is progressively increasing.
Generic . Elective (SamanyaAichchhik)

Semester - 1
(1.3) - 'LokpriyaSahitya'
This paper introduces the students to the concept of popular literature. The study of 'LokpriyaSahitya' helps in understanding the 'popular culture'. This includes the study of 'KaviSammelans' and popular poetry. The study of this paper is an analysis of several popular novelists such as Gulshan Nanda, Omprakash Sharma, Surendra Mohan Pathak, VedPrakash Sharma.

Semester - 2
(2.1)
HCC - 3: Hindi SahityaKa Etihash (AadikaalaurMadhyakaal)
The paper explores the social status of primordial period, major literary trends and general characteristics of ancient and medieval poetry. The Paper discuses the rise of Bhakti, it’s various streams and main characteristics.. Realization of medieval poetic traditions will be followed through the knowledge of the general characteristics of Ritikal's main poets.There have been many good poets of Bhakti, Niti and Veerata in this time, who represent medieval trends.

Semester - 2

(2.3) - RachnatmakLekhan

Through this paper students will learn the creativity in art, literature and all other forms of human activity. It also improves the language skill of students, as language skills are essential for communication and self-expression. Use of rhyme, rhythm, alliteration, irony, dialogue and a number of other devices while writing a particular piece of prose, poem or play can be learned through this paper.

Semester -3

Paper 3.1 / HCC - 5

Hindi SahityakaItihaas(AadhunikKaal)

The goal of the curriculum is to understand the history of Hindi literature -the evolution of independence movement and the Renaissance consciousness. And make aware of the outline of Hindi prose literature.

Paper 3.2 / HCC - 6

Hindi Kavita (AadhunikKaalChhayavadTak)

The objective of the paper is to introduce the students to compositions of great modern poets like MaithilisharanGupt, Jaishankar Prasad, SuryakantTripathiNirala, Ramdhari Singh Dinkar, SubhadraKumariChauhan and awareness of social, political and economic problems which were portrayed through the medium of Hindi poetry

Paper 3.3 / HCC – 7

Hindi Kahani

The main aim is to know the great storyteller of the modern era and understand the Indian society through the writings of Chandradhar Sharma Guleri, MunshiPremchand and Kashinath Singh.

Paper -3.4 / HGEC

BhashaaurSamaaj

This Paper explores and debate the interrelation between language and society. This paper discusses how language and society influences each other.

Paper 3.5 / HSEC

Social Media

The objective of the paper is to explain the importance and purpose of social media like Twitter, Facebook, Instagram etc. in global context

Semester -4

Paper 4.1 / HCC - 8

BharatiyaKavyaShastra

The basic purpose of this paper is to introduce the students to the rich tradition of Indian poetics. The Paper also explains different debates on Rasa ,Dhawani, and Alankaar etc.

Paper 4.2 / HCC - 9

Hindi Kavita (ChhayavadkeBaad)

The objective of this paper is to introduce the compositions of great modern Hindi poets like Agyeya ,NagaarjunDhoomilArun Kamal and others to our students

Paper 4.3 / HCC – 10

Hindi Upanyas

This paper is a study of the Hindi Novel and paper discusses in detail the work of great Hindi novelists like Premchand, Jainendra Kumar, Yash Pal and MannuBhandari.

Paper -4.4 / HGEC

BhashaShikshan

This Paper provides practical knowledge the art of language teaching to the students . It also throws light on the interrelationship between language and society.

Paper 4.5 / HSEC

BhashaaurSamaaj

The objective of the curriculum is to understand the importance and purpose of language in society and the inter-relation between the two.

Semester 5

Paper 5.1 :PaschatyaKavyashastra (HCC-11)

This paper introduces the students to western literary theories and their impact on Hindi literature. Ideological approaches about literature of renowned philosopher's, thinkers and writers are basic parts of this paper.

Paper 5.2 : Hindi NatakEvamEkanki (HCC-12)

This paper explores modern Hindi drama and Ekanki (One Act Play) mainly written in post-independence era (Modern era of Hindi literature).

Paper 5.3 (A) :AashmitamoolakVimershaur Hindi Sahitya (HDSEC)

This is a discourse centric paper which introduces the students to different contemporary discourses like Dalit, Women, Tribal and Gender and their presence in Hindi Literature etc.

Paper 5.3(B) :BhartiyaEvemPashchatyaRangmanchsiddanta (HDSEC)

This paper is a comparative study of western and Indian theatre theories. The paper helps the students to critically examine the relationship and contradictions between the both.

Paper 5.4(A) : Hindi BhashakaVyavharikVyakran (HDSEC)

This paper focuses on Hindi grammar and linguistics Hindi language. It is an advance level grammar paper which is mandatory in nature for every language student.

Paper 5.4(B) :BhartiyaSahityakiSankshiptRooprekha (HDSEC)

This paper focuses on classical and modern Indian literature of different languages like Sanskrit, Urdu, Kannada, Tamil, Telegu, Malayalam, Marathi, Gujrati etc.

Semester 6

Paper 6.1: Hindi Alochana (HCC-13)

This paper introduces the students to the origin and development of Hindi Criticism. It also explains the different approaches of Hindi critics and their contribution to Hindi Literature.

Paper 6.2: Hindi NibandhAur Anya GadyaVidhayen (HCC-14)

This paper is based on Hindi Essays and other literary forms of prose like autobiography, travelogue, Satire, character Sketch, Memoirs etc.

Paper 6.3(A) :Lok-Natak (HDSEC)

This paper introduces the students to Indian folk theater and its rich tradition. The famous regional folk Indian drama is part of this paper.

Paper 6.4(A) : Research methodology (HDSEC)

This paper introduces to different research methodology mainly in field of literature.

Paper 6.4(B) :AvdharnatmakSahityikPadya (HDSEC)

This paper deals with different different socio-political concepts and its depiction in both classical and modern Hindi Poetry.

Paper 6.4(C) : Hindi Rangmanch (HDSEC)

This paper explains the origin and development both of Indian classical and modern Hindi theatre. It also throws light on contribution of famous theatre personalities and their different styles.

Semester -1, 3 and 5

Paper - Compulsory Test in Hindi (C.T.H)

Link to syllabus: http://www.du.ac.in/du/uploads/Syllabus2016/CTestHindi.pdf

This is a compulsory paper for Non-Hindi speaking students who have not studied Hindi up to 8th standard. The aim of this paper is to make students proficient in Hindi so that they can use Hindi in their daily life.

Semester -2, 4 and 6

Paper –Compulsory Test in Hindi (C.T.H)

Link to syllabus: http://www.du.ac.in/du/uploads/Syllabus2016/CTestHindi.pdf

This too is a compulsory paper for Non-Hindi speaking students who have not passed the Hindi paper in class eight. It aims to make students proficient enough in Hindi so that they can use this language in their daily life.

Hindi for B.Com (Program)

Link to Syllabus:

http://www.du.ac.in/du/uploads/Syllabus_2015/B.A.%20Prog.%20Hindi.pdf

Hindi BhashaaurSahitya

Hindi A- This Paper is offered to the students who have studied Hindi Language upto12th standard. The Paper introduces the student of commerce to Hindi Prose , its different forms and famous writers like Bhartendu, Premchand, Hazari Prasad Dwivedi, Mohan Rakesh, MahadeviVerma,

Hindi B- This Paper is offered to the students who have studied Hindi Language up to 10th standard. This paper introduces the student to the History of Prose through the Modern era.

Hindi C- This Paper is offered to the students who have studied Hindi Language up to 8th standard. This Paper aims to provide in depth knowledge of History of Hindi poetry especially Bhakti and Ritikaleen poetry

2.BA (Honours) Hindi Journalism and Mass Communication (PatrakaritaEvam Jan Sanchar)

Link to syllabus:
http://www.du.ac.in/du/uploads/Syllabus_2015/B.A.%20Hons.%20Hindi%20Journalism%20&%20Mass%20Communication.pdf.

Course Outcome:

Today we are living in the age of mass communication and information technology. Media has the power to change the society and career in media is glamourous, demanding and rewarding. Hindi media is today arguably the most influential media as it directly covers 41 percent of total population of India. To meet the challenges of 21st century media we offer a course in Hindi PatrakaritaEvamJansanchar which is a job oriented course. after completing this course students can get employment in different Newspapers, Magazines, Radio, Films, Television, News Channels, Web Portals as reporters, content writers, editors, producers, anchors, radio Jockeys, news readers, translators, photo journalist, PR executive, advertising etc. This course provides necessary knowledge and tools for the challenging career in media. Graduate students will be proficient in areas ranging from media ethics, media policy, production skills and will be committed to providing the different media platforms with the content that meets local and regional needs. Students can also pursue a career in higher education and do M.A., M.Phil and Ph.D. and research in the field of Journalism and Mass communication. To provide practical knowledge and training we have a media lab and a Media Production Centre with latest machines and software. The department publishes a Newspaper RLA SAMACHAR and a magazine SAMBHAV, regularly.

Given below is a brief description of expected learning outcomes of the various papers taught as part of this three-year under-graduate program. The course structure is the same as for all Honors Courses in Arts.

Semester-1
Paper-1.1 JansancharMadhyam (Core Discipline-1)
This Paper introduces the students to the basics of Mass communication and Mass Media. Through this paper student can also learn about the impact of mass media on the society.

Paper-1.2
Hindi PatrakaritakaItihas (Core Discipline-2)

This Paper introduces the students to the History of the Hindi Journalism. The Paper is divided in four sections, titled- 1. History of Hindi Journalism before Independence 2.History of Hindi Journalism after Independence 3.Hindi Journalism from 1975 to 1990 4.Hindi Journalism after

1990. Through this Paper students can learn about the role of of Hindi Journalism in Indian freedom movement, Hindi Journalism in the time of emergency, Hindi Journalism in the age of liberalization and post liberalization.

Paper-1.3

(a) Sanskritisahityaaur Media (Generic Elective, Any one)

or

(b) Photo Journalism

The first generic paper discuses the relationship between the culture and the media. It also throws light on the impact of Media on society and deals with the issues of Popular culture, folk culture and culture in the time of internet and information technology.

The Second Generic paper - Photo Journalism introduce the students to the fascinating and challenging field of Photo Journalism and through this paper student can gain in depth knowledge of different types of Cameras, Camera angles and shots. Students also learn about the different photo editing tools and the basics of dubbing.

1-4 Language-MIL-Comm./ENGLISH, Environmental Science (AECC)

Semester-2

Paper- 2.1 JanmadhymonkiBhasha(Core Discipline-3)

This paper deals with the different aspects of language in mass media. which includes 'Print Media, Electronic Media (Audio and video), Translation and Technical terms of Media

Paper- 2.2 Samachar Ki Avadharanaaur Reporting

This paper explains the craft of Report writing and reporting to the students. The paper is divided four parts. Named.Meaning definition and elements of Report writing. This paper also tells about the functioning of news agencies.

Paper-2:3 Generic Elective (Anyone)

(A) **Film Adhyayan** -The paper on film studies introduces the students to the world of cinema, its history and different genres. This paper helps the students to understand the technique of film making and marketing of it.

or

(B) **Social Media** -The paper on Social media explains the students the basics of Social Media. This Paper is divided in four sections. 1. Introduction to the social Media 2. Different platform of social media like Facebook, Twitter, Instagram etc. 3. Commercial Usage of Social Media 4. Social Media and Society.

Paper 2.4 **Language-MIL-Comm./ENGLISH, Environmental Science (AECC)**

Semester. 3

3.1 **MadhaymKanoonAurAacharSamhita (Core Discipline-5)**

The Paper MadhaymKanoonAurAacharSamhita (Press Law and Ethics) provides in depth knowledge of Press Laws and ethics in India.

3.2 Sampadan (Core Discipline-6)

This Paper is designed to provide in depth knowledge of editing in print media, which includes principles of editing, copy editing, online editing, layout design of a newspaper,

3.3 Radio (Core Discipline-7)

The purpose of this paper is to provide knowledge about the Radio programming. It includes history of Radio, Types of radio channels like FM Radio, AM Radio, short wave and community radio, radio bulletin, programmes on women, children, science, sports, politics etc.

3.4 (A) RajnitiVichardharaaur Hindi Media (Generic Elective)

This Paper provide in depth knowledge about the Hindi Media's relationship with Politics and Ideology.

or

3.5 (B) Media Production

The aim of this paper is to provide knowledge of the process of media production in Print, Radio, Television/ Video, Film and Web.

3.5 (A) MudritMadhyamon Ki PrishthSajja(Skill Enhancement Course)

This paper is designed to enhance capabilities of the students to excel in the field of newspaper and magazine production.

or

3.5(B) Radio KarykramaurNirmaan

This Paper is designed for the skill enhancement of the students in the field of Radio Programming starting from idea to the broadcast.

Semester-4

4.1 New Media (Core Discipline-8)

We are living in the age of New Media. This paper focuses on practical knowledge of New Media. Which includes the history of Blog, its importance in bringing social change.Social Media, Web Portals and their functioning.

4.2 Television (Core Discipline-9)

This Paper familiarizes the students with functioning of Television as medium of Mass Communication, the role of Doordarashan as National broadcaster, the structure of Television Studio, editing and script writing for television programmes.

4.3 VikasPatrakarita (Core Discipline-10)

This Paper introduces the students to debates on meaning, basic principles and concept of Developmental Journalism, rural and regional journalism. This paper also discusses the problems and challenges of unorganised journalism sector.

4.4 (A) PatkathaLekhan (Generic Elective)

This Paper aims to provide the theoretical and practical knowledge of the craft of script writing in cinema, television and radio to the students. It also explores the relationship between script writing and Literature.

Or

4.4 (B) Sanchar Kranti, VaishvikPridrishyaaur Hindi Media

This Paper is focuses on Information technology, Contemporary world Scenario and Hindi Media. It introduces the students to the key debates of our times like privatization and corporatization of Media, Globalization, Terrorism, War and Politics of Arms, Environment and Contemporary Media.

4.5 (A) Documentary Making (Skill Enhancement Course)

This is a skill based paper to provide knowledge in the field of Documentary Film making, its history, principles and production.

or

(B) Television Karyakram :NirmankiPrakriya

This Paper explains the process of Television programme production its different stages and provide practical training in graphics, special effects, camera and video editing.

Semester-5

5.1 Media Research (Core Discipline-11)

This paper deals with the idea of research. Research methodology and content analysis topics are also included in it. This paper enables the students to use their knowledge and skills they have gained in the past academic years.

5.2 Media writing and News Paper making (Core Discipline-12)

This Paper includes different concepts of writing for media. In this paper students not only cover the theoretical aspects but also cover the practical aspects like designing and layout of Newspapers, Magazines, etc.

5.3 Hashiyekasamaj, Asmitavimarshaur Hindi media (Discipline specific elective-1)

This Paper deals with the different aspects of society and its relationship with mass media in Hindi speaking belt. This paper describes the marginalized society and their identification question indicating towards social-traditional background, question of caste, division in present social structure etc.

5.4 JanmadhyamokiSaidhantiki(Discipline specific elective-2)

This paper introduces mass media by describing its formats and types, work styles, objectives, new mass media and reviewing the mass media's presentation.

Semester-6

6.1 Vigyapan and Jansampark (Core Discipline-13)

In this paper students learn about advertising and public relations. How advertising is a means ofcommunication. In second unit of this paper describe about the different aspects of PR. It includes not only definition, needs and challenges but structure and functions of a PR industry as well.

6.3 PariyojnaKarya(Core Discipline-14)

This paper is practical part of the course with emphasis on Research.The topics are given by the External Examiners who then assess the student’s knowledge and skill through written document and viva -voce.

6.3 Media Management (Discipline specific elective-3)

This paper enables the students to know the meaning, definition, importance and principles of media management. This paper also includes press council act, management and capital planning and the economics of mass communication.

6.4 New Dimensions of Hindi Journalism (Discipline specific elective-4)

This paper describes new dimensions of Hindi journalism in four units, like interconnectivity of event management, sponsorship and journalism, the role of media in environment, disaster management, social liabilities of corporations and public administration institutions, interconnectivity commerce-management and journalism.

3. MA (Hindi)

To be filled in…

GENERIC ELECTIVES OFFERED BY DEPARTMENT OF HINDI TO STUDENTS OF OTHER COURSES

To be filled in…

DEPARTMENT OF HISTORY

Course Offered: BA (Honours) History

Link to Syllabus: http://www.du.ac.in/du/uploads/Syllabus_2015/BA%20Hons.%20History.pdf

Course Outcome:

History is not what is past, but the past which is forever made present. As a discipline, history allows the past to repeat itself. History covers the evolution of human civilization from time immemorial to present times. The course gives a good understanding of human strengths and limitations to the students. Faculty members of this department have diversified scholarly interests which enable them to respond creatively to the emerging needs of student community. After this course students can choose careers in administration, civil services, journalism, mass communication, teaching, research, and archaeology and museum studies.

Given below is a brief description of expected learning outcomes of the various papers taught as part of this three year under-graduate program. The course structure is the same as for all Honours Courses in Social Sciences.

History of India (750-1206AD): (B.A. Hons. History)

While explicating papers like History of India (750-1206AD) the students were exposed to rigors of how historical narratives are constructed/deconstructed and what critical historical methods are employed in this. In course of discussions on different aspects of courses offered, the taught learnt the craft of how to build arguments based on collated facts driven premises predicated on cogent reasoning. Since much attention was paid on their ability to communicate, this attribute along with other soft skills helped enhance their employability to carve a niche for oneself in the competitive job market/world.

Making of Contemporary India

While explicating papers like Making of Contemporary India, the students were exposed to rigors of how historical narratives are constructed/deconstructed and what critical historical methods are employed in this. In course of discussions on different aspects of courses offered, the taught learnt the craft of how to build arguments based on collated facts driven premises predicated on cogent reasoning. Since much attention was paid on their ability to communicate,

this attribute along with other soft skills helped enhance their employability to carve a niche for oneself in the competitive job market/world.

History of Modern East Asia-1 (c. 1840-1949):(BAHons. History)

This paper focuses on four key topics in China's modern history. The first is that of China's conflict with an aggressively expanding West in the 1800s, beginning with the demands made by England at the end of the eighteenth century; England, as was true with the other imperial powers, was intent on "opening up" trade with China. A second key topic is that of the internal crises that were occurring in China at this time: the rebellions, famines, and explosive population growth of the eighteenth and nineteenth centuries. A third major topic is that of the dialogue within China about how best to respond to these combined challenges and the extent and nature of the changes that were required. Dialogue about reform was many-faceted, and it vacillated between the progressive combinations of elements from the West with the best of Chinese traditions, to the outright rejection of the Chinese past. Finally, by the 1920s, some reformers turned revolutionary, discussing the relevance of Marxism for China. The fourth major topic is that of the Chinese communist revolution that unfolded in China in the 1930s and 1940s and the particular role played by Mao Zedong (Mao Tse-Tung) in adapting Marxism to the Chinese situation. Therefore this paper provides a broad canvas of thoughts in nation building.

History of the Modern Europe: (BA Hons. History (3rd year)

The history of modern Europe constitutes a sequel to the paper offered to the students in the previous semester as 'The Rise of the Modern West'. Alongside the chronological continuity, the paper on Modern Europe gives a thematic treatment to critical processes of historical significance like the French revolution, Industrial revolution, Spread of Nationalism and Liberalism as political and social ideas, Colonialism, Imperialism and the World War. The domain of culture is also touched upon in, as is evident in their connection with the Indian history and experience. It adds an extra edge tothe understanding of History.

Rise of Modern West: BA Hons. History (3rd year)

The paper intends to provide a wide ranging knowledge base of early modern European history.It covers enormous time span and vast geographical areas . The historiography relevant to this period enables the student to take note of the changes in the method of writing and interpreting history .Therefore it meets the requirement of student seeking careers in which an in depth knowledge of European history is desirable.

History of India (1206- 1770): BA Program (3rd year)

The paper enhances the ability to understand and appreciate the social, economic and political aspects of Indian history in its designated time period. It also facilitates for students to go in career options that require a good grounding in Indian history

History of India

With the study of this paper the students can define and identify the Indian earliest civilization from the primitive life to a civilized life. The study of this paper will be very beneficial for the students not only for the academic point of view but for the Indian civil services & provincial civil services also.

Delhi Sultanate

This paper enables students to create link between the ancient and Mughal history. This paper provides an insight into the new Indo-Islamic Culture, be it architecture or music and the new philosophy of Sufi ideas that binds different cultures. New literature flourished with mix of vernaculars and Persian.

History of India (c. 1605-1750) BA (H) History, 3rd Year (CORE PAPER)

The paper aims at making the students aware about various aspects of political, economic, religious and cultural progress of India during the rule of the Mughals. In addition, the paper also enlightens the students about several dimensions of regional state formation subsequent to the decline of the Mughal empire in the 18th century

Understanding Heritage B A (H) History, 2nd Year (SE Course)

This skill enhancement paper aims at sensitizing the students about the need to protect and preserve our heritage (both tangible and intangible). It also make students aware about the national and international bodies engaged in such an endeavor besides the legislations enacted for the same. Through field projects students learn about the significance of and problems faced in preservation and protection of our heritage.

Social Formations and Cultural Patterns of Ancient and Medieval World

The course is designed to familiarize students with the evolution of human societies, from the origin of humankinds to the development of societies in central Islamic lands. The broad themes of the course illuminate fascinating journey of the human past, beginning of agriculture and animal husbandry, emergence of Bronze Age civilizations, Greco-Roman antiquity European feudalism etc.

DSE 1 History of USA: Independence to Civil War

This paper deals with history of USA from colonialism to Civil war. It will help understand contemporary political, economic and diplomatic moves of USA and its relationship with other counties. Students will be able to connect its history from origin, British colonialism to emergence of new state and how USA coped with internal problems such as slavery. Knowing history of USA become important after disintegration of USSR as world has unipolar axis that revolves around USA.

DSE II

History of the USSR: From Revolution to World War II (1917-1945)

This course aims to examine the political, social and cultural developments in the Soviet Union between 1917 and 1945.

The course highlights the social tensions and political inconsistencies that spurred radical change in the government of Russia and its foreign policy issues

Delhi through ages (GE)((B.A. Hons.)

Students are expected to learn the changing morphology of the city Delhi in different era. It gives an insight to students regarding different cities of Delhi in different times from ancient to modern. One needs to understand the monumental evidences of the city that represents and retell the history of

B.A. Program (3rd year)

Some Aspects of Society and Economy of Modern Europe: 15^{th} -18^{th} Century

This paper covered broad historical knowledge about feudalism, renascence, and objectives of colonialism, modern scientific developments in the world and economic development with emergence of capitalism and industrial revolution. Students strengthen themselves with origin of advanced historical development of Europe by studying this paper.

Archives and Museum (SEC) BA Program (3rd year)

Archives and Museum is a skill based paper intended to hand-hold the students into their understanding about the history, circumstances and purpose of setting up archives and museums in the modern sense of the term equipped with the case studies of several Indian museums and archives, the paper also exposes the students to the changing technological and displays related challenges in the contemporary times.

History of India from Earliest Times up to 300 CE: (BA Program I^{st}year)

A history of India upto 300 AD is an overview course for B.A. program students who have chosen History as their option. In terms of time, it covers the history of India from the earliest instant of social life of our ancestors down to the emergence of Indian state as an entire in the form of Mauryas. It also covers the issues related to sources, methods and interpretation in history writing.

History of India III (8th- 18th Century): BA Program

Semester III.

This course gives a comprehensive overview of the history of the Indian subcontinent during the thousand-year period between the eighth and the eighteenth century. It particularly emphasizes on the characteristics of the Medieval India. It highlights the coming of Delhi Sultanate and its social, political, economic and administrative structure. Interestingly the course covers other aspects of Delhi Sultanate such as its architecture, religious movements etc.

GENERIC ELECTIVES OFFERED BY DEPARTMENT OF HISTORY TO STUDENTS OF OTHER COURSES

Gender and Education in India (GE)

This paper deals with role of education in empowering women in different historical times including present day. Paper will help to understand the present low literacy rate of women as it connects with different political, economic and social-cultural conditions which hampered women's education.

Possibly incomplete

DEPARTMENT OF POLITICAL SCIENCE

Course offered: BA (Honours) Political Science

Link to Syllabus:
http://www.du.ac.in/du/uploads/Syllabus_2015/BA%20Hons%20Political%20Science.pdf

Course outcome:

One of the most sought after Social Science courses at the undergraduate level in the University of Delhi. The syllabus includes a blend of conceptual and theoretical papers along with others based on contemporary as well as classical political and social themes. Apart from focusing on India the course provides an in-depth understanding of world politics as well. In recent years the course has been restructured to also include various empirical research based topics. The course offers students a strong platform to venture into diverse fields like academics, research, teaching, civil services, journalism, etc.

In terms of providing facilities to its students the department organizes various in-class as well as intra-department activities some of which includes seminars, debates, quiz contests, mock parliament, creative writing contests, group discussions, paper presentations etc. These are especially designed to prepare students to become better equipped towards pursuing their desired career goals and ambitions.

The course aims to equip students with analytical skills which can broaden his/her understandings of the societal complexities, especially socio-political. Overall the course trains students for various pursuits ahead in life, be it professional, personal or as part of larger human community. Precisely the course helps students to pursue careers like research, teaching, NGO work, civil services, journalism, social work and activism, etc. Apart from providing knowledge, set of skills the course is also designed such that it helps develop an attitude among students which is progressive, inclusive, and rigorous in approach and has a definitive moral compass.

Given below is a brief description of expected learning outcomes of the various papers taught as part of this three year under-graduate program. The course structure is the same as for all Honours Courses in Social Sciences.

CORE Papers

1. **Understanding Political Theory -** introduces the students to the idea of political theory, its history and approaches, and an assessment of its critical and contemporary trends.
2. **Constitutional Government & Democracy in India –** introducesthe constitutional design of state structures and institutions, their actual working over a period of time and interaction with the larger extra-constitutional environment.

3. **Political Theory –Concepts and Debates –** familiarizes students with the basic normative concepts and various debates of political theory to encourage critical and reflective analysis.
4. **Political Process in India –** discusses how actual politics in India diverges quite significantly from constitutional legal rules.
5. **Introduction to Comparative Government and Politics -** Focuses on examining politics in a historical framework while engaging with various themes of comparative analysis in developed and developing countries.
6. **Perspectives On Public Administration –** Discussespublic administration in its historical context and also explores some of the recent trends, including feminism and ecological conservation, greater democratization etc.
7. **Perspectives on International Relations and World History –** Introduces theoretical approaches for studying international relations and provides overview of the major political developments and events starting from the twentieth century.
8. **Political Processes and Institutions in Comparative Perspective –** Trains students in the application of comparative methods to the study of politics.
9. **Public Policy and Administration in India –** Elaborates interface between public policy and administration in India and deals with issues of decentralization, financial management, citizens and administration and social welfare from a non-western perspective.
10. **Global Politics -** Introduces students to the key debates on the meaning and nature of globalization by addressing its political, economic, social, cultural and technological dimensions.
11. **Classical Political Philosophy -** Course goes back to Greek antiquity and familiarizes students with the manner in which the political questions were first posed.
12. **Indian Political Thought-I -** Introduces the specific elements of Indian Political Thought spanning over two millennia while encouraging a specific knowledge of individual thinkers and texts.
13. **Modern Political Philosophy –** The paper discusses how philosophy and politics are closely intertwined and explores this convergence by identifying four main tendencies here: Modernity, Romantics, Liberal Socialists and Radicals.
14. **Indian Political Thought-II -** Based on the study of individual thinkers, the courseintroduces a wide span of thinkers and themes that defines the modernity of Indian political thought.

Discipline Specific Elective Papers (DSE)

1) **CITIZENSHIP IN A GLOBALIZING WORLD -** Citizenship assigns a legal status, a set of rights, immunities and protections in the modern age. Paper explores theories of

citizenship, the historical development of the concept and its practice of in an increasingly globalizing world.

2) **Development Process and Social Movements in Contemporary India -** Course proposes to introduce students to the conditions, contexts and forms of political contestation over development paradigms and their bearing on the retrieval of democratic voice of citizens.
3) **Women, Power and Politics -** This course opens up the question of women's agency, taking it beyond 'women's empowerment' and focusing on women as radical social agents. It attempts to question the complicity of social structures and relations in gender inequality.

Ability Enhancement Skill Based Paper (AESB)

1) **Your Law, Your Rights -** This course aims to understand law as a source of rights, as a progressively widening sphere of substantive justice, welfare, and dignity.

GENERIC ELECTIVES OFFERED BY DEPARTMENT OF POLITICAL SCIENCE TO STUDENTS OF OTHER COURSES

1) GE-1
   Nationalism in India – The paper helps students to understand India's freedom struggle from various perspectives.

2) GE-2
   Gandhi & the contemporary world – The paper locates Gandhi in the global frame and how he continues to stay relevant.

3) GE-3
   Understanding Ambedkar – the paper introduces Ambedkar's ideas and their relevance in contemporary India, by looking beyond caste.

4) GE-4
   Governance – Issues and challenges – introduces concepts and different dimensions of governance highlighting the major debates in the contemporary times.

The BA Program

PROGRAM SPECIFIC OUTCOME

The ever-rising cut-off percentages for admissions indicate that the B.A. Program is a very popular course. Students appreciate the tremendous potential of this program as it can be tailor-made to suit their interests and abilities. It gives them a broad academic orientation, allowing them to choose from various discipline, application and language courses. The wide range of options available for this program truly epitomizes the **choice-based** approach to higher education. The program has now been restructured with subjects of contemporary and topical relevance.

STRUCTURE OF BA PROGRAM

Semester I	**Semester II**
Language Course- IA (ENGLISH A or B)	Language Course- II A (HINDI A or B or C)
AECC(EVS/MIL)	AECC(EVS/MIL)
Discipline Course-IA	Discipline Course-IB
Discipline Course-IIA	Discipline Course-II B

* Course content subject to change as per the University guidelines.

Semester III	**Semester IV**
Language Course- I B(ENGLISH A or B)	Language Course- II B(HINDI A or B or C)
SEC I	SEC I
Discipline Course-IC	Discipline Course-ID
Discipline Course-IIC	Discipline Course-II D

Semester V	**Semester VI**
Discipline Specific Elective-I A	Discipline Specific Elective-IB
Discipline Specific Elective-II A	Discipline Specific Elective-II B
SEC-III	SEC-IV
Generic Elective-I	Generic Elective-II

Four combinations of Discipline Courses offered to students of BA Program at RLA:

1. **Computer Applications and Mathematics**
2. **Computer Applications and Economics**
3. **Mathematics and Economics**
4. **History and Political Science**

Papers of Semester I

1. Compulsory Paper, Advanced English: Stream A (Core, English)
   Details pending

2. Paper: Principles of Microeconomics – I
   Type: Core Course Economics

   Value from the paper: A beginner's course on Microeconomics. This paper helps students understand economic reports and events. The paper also helps in gaining a broad perspective and thus prepares students for competitive examinations.

3. Paper: History of India from Earliest Times up to 300 CE (Core, History)
   A history of India up to 300 AD is an overview course for B.A. program students who have chosen History as their option. In terms of time, it covers the history of India from the earliest moments of social life of our ancestors down to the emergence of Indian state as a whole in the form of the Mauryas. It also covers the issues related to sources, methods and interpretation in history writing.

4. Paper: Introduction to Political Theory (Core)
   This paper introduces the students to the idea of political theory, its history and approaches, and an assessment of its critical and contemporary trends.

5. Paper: Computer Fundamentals (Core, Computer Science)
   This course will provide with the fundamental skills and concepts required to maintain, support, and work efficiently with personal computers. This course is designed to teach the students basic concepts of computer system, Networks and Internet. It includes computer hardware, computer software, networking, security, and basic IT literacy.

6. Paper: Calculus (Core, Mathematics)
   Calculus is essential for many areas of science and engineering. Both make heavy use of mathematical functions to describe and predict physical phenomena that are subject to continuous change, and this requires the use of calculus. This course provides a comprehensive survey of differential and integral calculus concepts, including limits, derivative and integral computation, linearization, Riemann sums, the fundamental theorem of calculus, and differential equations. Content is presented in 5 units and covers various applications, including graph analysis, linear motion, average value, area, volume, and growth and decay models. In this course students use an online textbook, which supplements the instruction they receive and provides additional opportunities to practice using the content they've learned. Students will learn to use an embedded graphing calculator (**CASIO 991 ES**) and Mathematical Software **MATHEMATICA** for their Practical understanding of the topic.

7. Paper: English A (AECC, English)
   Details awaited

8. Paper: Hindi BhashaaurSampreshan (AECC, Hindi)
   'Hindi BhashaAurSampreshan' is a course of Hindi language. The aim of this paper is to enhance the work efficiency and linguistic skills of students. This course is definitely useful. Be it commercial, academic, social or political -in every sphere of life today, efficient communication is the basis of success. Its significance is progressively increasing.

Papers of Semester II

To be filled in…

Papers of Semester III

1. Advanced English Stream A (Core, English)
   Details awaited

2. Comparative Government and Politics (Core, History)
   Details awaited…62324306

3. History of India from C 1206- 1707 (Core, History)

The paper enhances the ability to understand and appreciate the social, economic and political aspects of Indian history in its designated time period. It also facilitates for students to go in career options that require a good grounding in Indian history

4. Legislative Support (Core??, Political Sciences??) 62323312

5. Principles of Macroeconomics –I (Core, Economics)
   Value from the paper: A beginner's course in Macroeconomics. It helps students to make sense of economic reports and events. It also broadens their perspective and prepares them to face competitive examinations with sound understanding of the subject.

6. Computer Networks and Internet Technologies (DSC-1C, Computer Science)
   This paper introduces the basic knowledge on Computer Networks i.e. how the computers are connected in a network, what are the different layers, how data is travelled and exchanged between two computer systems. The second part deals with introduction of creating web pages, forms using HTML, and usage of little bit of JavaScript.

7. Office Automation Tools (SEC-1, Computer Science)
   The objective of the course is to make students understand and learn various Office Automation Tools like MS Word, MS Excel & MS PowerPoint. The outcome of the course is that the students will be able to use various Office Automation Tools like MS Word, MS Excel & MS PowerPoint.

8. Analytic Geometry and Applied Algebra (Core, Mathematics)
   The subject aims to impart analytical knowledge of geometry and application of network analysis in real world problem to the students of BA (Program). The content is prescribed in three units and covers various application of conics, including graphing of conics, 2-D &3-D graphing of sphere, cylinders, mathematical modelling of Matching Job, Network reliability, Street Surveillance, Scheduling Meetings, Spelling Checker etc.

9. Latex and HTML (SEC, Mathematics)
   The Skill Enhancement Courses are skill-based and are aimed at providing hands-on-training, competencies, skills, etc. through ***the tools of modern Mathematics***. One such important tool is LATEX, which is an easy-to-use version of TEX designed by Leslie Lamport. LATEX files are text files, which we can edit with simple text editors such as Notepad or Notepad++. There are dedicated editor for LATEX files.

While it is possible to create beautiful mathematical documents with other software, no other program has the ubiquity of LATEX for mathematical writing. It can be used to type assignments, research articles and books involving equations, in more convenient ways than any other available software. This course provides comprehensive information including graphic design using PS-tricks, beamer presentation formats etc. The hands-on training on LATEX will open the door for students to become freelancers. They can also associate themselves with publishing companies, as reputed publishing companies require LATEX experts. Publishers also outsource projects to freelancers.

10. Hindi A (AECC ???, Hindi)
    This Paper is offered to the students who have studied Hindi Language upto12 thstandard. The Paper introduces the student of commerce to Hindi Prose, its different forms and famous writers like Bhartendu, Premchand, Hazari Prasad Dwivedi, Mohan Rakesh, MahadeviVerma

Papers of Semester IV

To be filled in

Papers of Semester V

1. Economic Development and Policy in India –I (Discipline Specific Elective, Economics)
   Prepares for advanced studies on Indian Economy and competitive examinations and promotes understanding of economic reports and issues.

2. Some Aspects of Society and Economy of Modern Europe: 15th -18th Century (DSE, History)
   This paper broadly covers the history about feudalism, renaissance, colonialism, modern scientific developments in the world and economic development with emergence of capitalism and industrial revolution. Students strengthen themselves with knowledge about the origin of advanced development of Europe by studying this paper.

3. Archives and Museum (SEC, History)

Archives and Museum is a skill based paper intended to hand-hold the students into their understanding about the history, circumstances and purpose of setting up archives and museums in the modern sense of the term equipped with the case studies of several Indian museums and archives, the paper also exposes the students to the changing technological and displays related challenges in the contemporary times.

4. Administration and Public Policy: Concepts and Theory (Core, Political Science)
   This paper elaborates the interface between public policy and administration in India and deals with issues of decentralization, financial management, citizens and administration and social welfare from a non-western perspective.

5. Gender education in India (GE, History)
   This paper deals with role of education in empowering women in different historical times including present day. Paper will help to understand the present low literacy rate of women as it connects with different political, economic and social-cultural conditions which hampered women's education.

6. IT Fundamentals (GE, Computer Science)
   This course will provide the fundamental skills and concepts required to maintain, support, and work efficiently with personal computers. This course is designed to teach the students basic concepts of computer system, Networks and Internet. It includes computer hardware, computer software, networking, security, and basic IT literacy.

7. Visual Programming (DSE-1B, Computer Science)
   This course introduces computer programming using the Visual BASIC programming language with object-oriented programming principles. Emphasis is on event-driven programming methods, including creating and manipulating objects, classes, and using object-oriented tools such as the class debugger. Upon completion, students should be able to design, code, test and debug at a beginning level.

8. Data Analysis (SEC, Economics)
   This paper offers a basic course in statistics, with an emphasis on economics.

9. Differential Equations (Core, Mathematics)

A differential equation is a mathematical equation that relates some function with its derivatives. In applications, the functions usually represent physical quantities, the derivatives represent their rates of change, and the equation defines a relationship between the two. Because such relations are extremely common, differential equations play a prominent role in many disciplines including engineering, physics, economics, and biology.
The content covered in the widest sense in four units: ordinary and partial differential equations, functional and abstract differential equations, dynamical model including predator-prey model and its analysis, competing species and its analysis, epidemic model of influenza and its analysis, battle model and its analysis, integro-differential equations etc. The topics include the study of asymptotic behavior, stability, oscillations, periodic solutions, bifurcations and applications to ecology, population, biology, and engineering sciences. The student will design and analyse the outcomes of above model and predict the result through mathematical software Mathematica/Matlab.

Papers of Semester VI

To be filled in

MATHEMATICS & ECO COMBINATION

SEM_I

AECC-ENG/MIL

Language- English A or B

Discipline Course-IA- CALCULUS

Discipline Course-IIA- Principles of Microeconomics – I

SEM_II

AECC-EVS

Language- Hindi A or B or C

Discipline Course-I B- ALGEBRA

Discipline Course-II B- Principles of Microeconomics – II

SEM_III

Language- English A or B

Discipline Course-IC- Analytic Geometry and Applied Algebra

Discipline Course-II C- Principal of Macroeconomics -1

SEC-1 - LATEX

SEM_IV

Language- Hindi A or B or C

Discipline Course-I D- Analysis
Discipline Course-II D- Principal of Macroeconomics -1I

SEC-2 - COMPUTER ALGEBRA SYSTEM

SEM_V

Discipline Specific Elective-I A- Differential Equations

Discipline Specific Elective-II A- Development and Policy in India –I

GE- CS/HISTORY

SEC-3 - R-Software

SEM_VI

Discipline Specific Elective-I B- Numerical Analysis

Discipline Specific Elective-II B

GE- CS/HISTORY

SEC-4 - Transportation and Game Theory

MATHEMATICS & CS COMBINATION

SEM_I

AECC-ENG/MIL

Language- English A or B

Discipline Course-IA- CALCULUS

Discipline Course-IIA- Computer Fundamental

SEM_II

AECC-EVS

Language- Hindi A or B or C

Discipline Course-I B- ALGEBRA

Discipline Course-II B- DBMS

SEM_III

Language- English A or B

Discipline Course-IC- Analytic Geometry and Applied Algebra

Discipline Course-II C- Computer Networks and Internet Technologies

SEC-1 - LATEX

SEM_IV

Language- Hindi A or B or C

Discipline Course-I D- Analysis
Discipline Course-II D-

SEC-2 - COMPUTER ALGEBRA SYSTEM

SEM_V

Discipline Specific Elective-I A- Differential Equations

Discipline Specific Elective-II A- Visual Programming

GE- ECO/HISTORY

SEC-3 - R-Software

SEM_VI

Discipline Specific Elective-I B- Numerical Analysis

Discipline Specific Elective-II B

GE- ECO/HISTORY

SEC-4 - Transportation and Game Theory