Annasaheb Gundewar College

Katol Road, Nagpur-13

Faculty of Science & Technology

Four Year Bachelor of Science with Major (Honours / Research) Degree

Duration of the Programme: Four academic years consisting of eight semesters.

Class	Sem.	Courses	Names of Major & Their Papers/ Subjects					
			Chemistry	**Physics**	**Botany**	**Zoology**	**Mathematics**	**Computer Science**
B.A. Part-I 1st Year Level : 4.5	1st	Major	Inorganic Chemistry 1 (Atomic structure, bonding and main group elements) - T & P	Measurement, Mechanics, and Properties of Matter – T&P	Microorganisms- Viruses, Prokaryotes, Algae and Fungi –T&P	Life and Diversity of Animals-Nonchordates (Protozoa to Annelida) –T&P	Algebra and Trigonometry –T&P	Programming in 'C' – T&P
		Major	Organic Chemistry-1 (Fundamentals, stereochemistry and hydrocarbons) – T & P	Kinetic Theory of Gases and Thermodynamics – T&P	Cryptogams-Bryophyta, Palaeobotany & Pteridophyta –T&P	Environmental Biology –T&P	Differential Calculus –T&P	Computer Fundamentals –T&P
		OE	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3
		OE	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3
		VSC	Soap, detergent and disinfectant Technology	Electronic and Electrical Components	Identification of Angio spermic plants	Vermicomposting	Sage Math software system	Office Automation
		SEC	Food Adulteration Analysis	Electric Wiring for Domestic Applications	Soil analysis and hydrobiology	Beekeeping	Aptitude and Reasoning	Desk Top Publishing
		AEC	English Compulsory	English Compulsory	English Compulsory	English Compulsory	English Compulsory	English Compulsory
		VEC	Environmental Science	Environmental Science	Environmental Science	Environmental Science	Environmental Science	Environmental Science
		IKS	Vedic Mathematics	Vedic Mathematics	Vedic Mathematics	Vedic Mathematics	Vedic Mathematics	Vedic Mathematics
		CC	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS
	2nd	Major	Organic Chemistry-2 (Functional group chemistry) - T & P	Acoustic and Ultrasonics – T&P	Spermatophyte- Gymnosperm & Angiosperm Morphology-T&P	Life and Diversity of Animals-Nonchordates (Arthropoda to Hemichordata) -T&P	Integral Calculus and Ordinary DEq -T&P	Object Oriented Programming using 'C ++' -T&P
		Major	Physical Chemistry-1 (Thermodynamics, gaseous and liquid	Oscillations and Blackbody Radiation – T&P	Cell Biology & Genetics (Mendelism)-T&P	Cell Biology -T&P	Vector Analysis - T&P	Operating Systems T&P

			states) – T & P				
		OE	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3
		OE	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3
		VSC	Drug synthesis and analysis	Instrumental Errors in Measurement	Horticulture	Culture of Indian major Carps	Maxima software system	Computer Animation
		SEC	Water and wastewater analysis	Fundamentals of Data Analysis and Data Interpretation	Plant Pathology and Disease Management	Lac culture	Financial Mathematics	Tally
		AEC	Second Language	Second Language	Second Language	Second Language	Second Language	Second Language
		VEC	Constitution of India	Constitution of India	Constitution of India	Constitution of India	Constitution of India	Constitution of India
		IKS	Indian Astronomy	Indian Astronomy	Indian Astronomy	Indian Astronomy	Indian Astronomy	Indian Astronomy
		CC	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS
B.A. Part-II, 2nd Year Level : 5.0	3rd	Major	Physical Chemistry-2 (Surface chemistry, phase equilibria, electrochemistry and kinetics)	Solid State Physics T &P	Algae, Fungi, Lichen &Plant Pathology-T&P	Life and Diversity of Animals- Chordates (Protochordata to Amphibia) -T&P	Partial Differential Equations -T&P	Data Structures -T&P
		Major	Inorganic Chemistry 2 (Bonding, transition elements and solutions)	Optics – T&P	Fossil Angiosperms &Angiosperm Taxonomy-T&P	Genetics -T&P	Analytical Solid Geometry-T&P	Linux Operating System-T&P
		Minor	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5
		Minor	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5
		OE	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3
		VSC	Soil sampling and analysis	Regulated Power Supply	Plant pathology and Disease management	Aquarium preparation and maintenance	Mathematical foundation for data science	Web design using HTML and DHTML
		AEC	Second Language	Second Language	Second Language	Second Language	Second Language	Second Language
		FP	Field Project	Field Project	Field Project	Field Project	Field Project	Field Project
		CC	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS
	4th	Major	Inorganic Chemistry-3 (Coordination chemistry, Redox reactions and Inorganic Polymers) T &P	Lasers and Optical Fibres – T&P	Genetics, Plant breeding, Biostatistics & Evolution-T&P	Life and Diversity of Animals- Chordates (Reptilia to Mammalia) -T&P	Mathematical Methods -T&P	Java Programming -T&P
		Major	Organic Chemistry-3 (Nitrogen	Mathematical Physics T&P	Plant Development, Anatomy& Embryology	Developmental Biology	Sequences and Series -T&P	Software Engineering -T&P

			compounds, Heterocyclics and organometallics) T &P		–T&P	-T&P		
		Minor	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5
		Minor	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5
		OE	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3	Refer Table - 3
		SEC	Phytochemistry	Advanced Experimentation	Nursery & Green House Management	Clinical Pathology	Applied Mathematics for Data Science in Excel	Visual Basic Programming
		AEC	English Compulsory	English Compulsory	English Compulsory	English Compulsory	English Compulsory	English Compulsory
		CEP	Community Service	Community Service	Community Service	Community Service	Community Service	Community Service
		CC	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS	EP/Sports/Cultural/NSS
B.A. Part-III, 3rd Year Level : 5.5	5th	Major	Organic Chemistry-4 (NMR, Enolates and Natural products) – T&P	Electrostatics and Electric Currents –T&P	Biochemistry & Plant Physiology-T&P	General Mammalian Physiology -T&P	Analysis -T&P	Advanced JAVA Programming -T&P
		Major	Physical Chemistry-3 (Solid state, Surface Chemistry, Spectroscopy and Quantum mechanics) - T &P	Magnetostatics and Magnetism –T &P	Economic botany, Ethnobotany & Phytogeography-T&P	Applied Zoology -T&P	Abstract Algebra - T&P	Database Management System-T&P
		Major	Inorganic Chemistry-4 (Complexes and Organometallics)- T &P	Electronic Devices and Circuits –T&P	Medicinal Plants: Cultivation and Practices-T&P	Evolutionary Biology - T&P	Mechanics -T&P	Data Communication and Networks -T&P
		Major ELT	Basic Analytical Chemistry / Industrial Chemistry -T&P	Digital Electronics and Microprocessor / Optoelectronics and Devices –T&P	Pharmacognosy and Phytochemistry / Forestry-T&P	Systematic Entomology / Systematic Ichthyology / Male Mammalian Reproductive Physiology / Endocrinology T&P	Linear Programming Problems / Statistics T&P	Web Technology / E-Commerce T&P
		Minor	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5
		Minor	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5
		VSC	Vocational IT skills	Optical Instruments	Plant propagation and tissue culture	Silkworm culture	Scilab	Web Development using Java
		CEP	Community Service	Community Service	Community Service	Community Service	Community Service	Community Service

		Chemistry	Physics	Botany	Zoology	Mathematics	Computer Science
6th	**Major**	Physical Chemistry-4 (Electrochemistry, Quantum Chemistry and Characterization) T&P	Quantum Mechanics-I T&P	Ecology & Laboratory Instrumentation -T&P	General Mammalian Physiology II -T&P	Complex Analysis - T&P	Cyber Security -T&P
	Major	Inorganic Chemistry-5 (Bioinorganic Chemistry) T&P	Classical Mechanics T&P	Biotechnology& Molecular Biology -T&P	Parasitology -T&P	Linear Algebra - T&P	SQL and PL/SQL - T&P
	Major	Organic Chemistry-5 (Molecules of life) T&P	Atomic and Molecular Physics – T&P	Seed Technology & Plant Nursery -T&P	Molecular Biology - T&P	Graph Theory -T&P	Python Programming-T&P
	Major ELT	Instrumental Methods of Analysis / Chemistry of dyes and drugs - T & P	Analogue and Communication Electronics / Astrophysics and Special Theory of Relativity	Molecular biology & Bioinformatics / Laboratory Techniques - T&P	Insect Morphology and Physiology / Fish Physiology / Female Mammalian Reproductive Physiology / Biochemistry -T&P	Mathematical Modeling / Special Theory of Relativity -T&P	ASP.NET / Embedded System-T&P
	Minor	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5	Refer Table-5
	VSC	Oil and Fats technology	Installation of Rooftop Solar Systems		Prawn culture	Statistics with R	Shell Programming
	OJT / ITSP	Internship (Related to Major)	Internship (Related to Major)	Internship (Related to Major)	Internship (Related to Major)	Internship (Related to Major)	Internship (Related to Major)
B.A. Part-IV, 4th **Year Level : 6.0** **7**th	**Major**	Advanced Inorganic Chemistry-1 –T&P	Numerical Methods and Complex Analysis T&P	Microbiology, Algae and Fungi -T&P	Systematic Zoology-T&P	Algebra-1 -T&P	Artificial Intelligence -T&P
	Major	Advanced Organic Chemistry-1 –T&P	Statistical Physics – T&P	Bryophytes and Pteridophytes -T&P	*For Honours:* *Biotechnology - T&P* *For Research*: *Techniques in Life Sciences*	Real Analysis-1 - T&P	Compiler Construction -T&P
	Major	Advanced Physical Chemistry-1 –T&P	Electrodynamics –T&P	Palaeobotany and Gymnosperms -T&P	Biostatics and Bioinformatics -T&P	Topology -T&P	Neural Network - T&P
	Major	*For Honours Only: Advanced Analytical Chemistry-1 –T&P*	*For Honours Only: Advanced Mathematical Physics T&P*	*For Honours Only: Cytology and Genetics - T&P*	*For Honours Only: Microtechniques -T&P*	*For Honours Only: Ordinary Differential Equations -T&P*	*For Honours Only: Data Mining T&P*
	Major ELT	*Common for both H & R : Environmental Chemistry /*	*Common for both H & R Experimental Techniques in Physics /*	Plant Identification & Herbarium Technique /	*Common for both H & R Insect pests / Applied Fisheries /*	*Common for both H & R* Advanced Numerical Methods /	*For Honours: Discrete Mathematics / Digital Electronics and*

		Chemistry	Physics	Botany	Zoology	Mathematics	Computer Science
		Chemistry of natural products T&P	*Sources of Energy and Energy Storage Devices*	Ethnobotsany)	*Reproductive Endocrinology and Toxicology / Nerve Physiology -T&P*	**For Honours:** Fluid Dynamics ***For Research:*** Ordinary Differential Equations T&P	*Microprocessor **For Research:** Data Mining / Soft Computing*
	RM	Research Methodology T & P	Research Methodology T & P	Research Methodology – T&P	Research Methodology T & P	Research Methodology T & P	Research Methodology T & P
	RP	***For Research Degree:*** *Research Project*	***For Research Degree:*** *Research Project*	***For Research Degree:*** *Research Project*	***For Research Degree:*** *Research Project*	***For Research Degree:*** *Research Project*	***For Research Degree:*** *Research Project*
8th	**Major**	Advanced Inorganic Chemistry-2 –T&P	Quantum Mechanics -II T&P	*Plant Physiology and Biochemistry. For Research: Plant Physiology and Biochemistry Ethnobotany - T&P*	Biotechniques - T&P	Algebra-2 - T&P	Cloud Computing - T&P
	Major	Advanced Organic Chemistry-2 –T&P	Spectroscopy –T&P	*Plant Development and Reproductive Biology For Research: Plant Development and Reproductive Biology Angiosperms-I- T&P*	Ethology - T&P	Real Analysis -2 - T&P	Machine Learning - T&P
	Major	Advanced Physical Chemistry-2 –T&P	Nuclear and Particle Physics – T&P	Cell and Molecular Biology-I -T&P	***For Honours:*** *Molecular Biology - T&P* ***For Research:*** *Molecular Biology& Immunology - T&P*	Differential Geometry - T&P	R-Programming - T&P
	Major	***For Honours Only:*** *Advanced Analytical Chemistry-2 –T&P*	***For Honours Only:*** *Advanced Electrodynamics –T&P*	*Angiosperms-I and Ethnobotany -T&P*	***For Honours Only:*** *Immunology - T&P*	***For Honours Only:*** *Integral Equations - T&P*	***For Honours Only:*** *Computer Graphics T&P*
	Major ELT	***Common for both H & R :*** *Polymer Chemistry / Organometallic and bioinorganic Chemistry T &P*	***Common for both H & R :*** *Biophysics and Biodevices / Nanomaterials and Properties*	(Biodiversity and Environment / Plant Biochemistry) -T&P	***Common for both H & R*** Industrial Entomology / Fishery technology and fish pathology / Avian Biology / Hydrobiology - T&P	***Common for both H & R*** General Theory of Relativity /***For Honours:*** Operations Research ***For Research:*** Integral Equations - T&P	***For Honours:*** *Computer Architecture and Organization / PHP* ***For Research:*** Digital Image Processing / Internet of Things
	OJT / RP	*For Honours: Apprenticeship For Research: Research Project / Dissertation*	*For Honours: Apprenticeship For Research: Research Project / Dissertation*	*For Honours: Apprenticeship For Research: Research Project / Dissertation*	*For Honours: Apprenticeship For Research: Research Project / Dissertation*	*For Honours: Apprenticeship For Research: Research Project / Dissertation*	*For Honours: Apprenticeship For Research: Research Project / Dissertation*

Table - 3

Selection of Open Elective Courses

Basket of Open Elective Courses Available in the College for B.Sc. course only

Gr.	Major	Basket of Minor Semester wise					
		I		II		III	IV
		OE-1	OE-2	OE-3	OE-4	OE-5	OE-6
A	**Chemistry**	Food Adulteration	Cosmetic Chemistry	Kitchen and Nutrition Chemistry	Basics of Environmental Pollution	Chemistry in everyday life	Molecules of Life
B	**Physics**	Space Science		Energy sources		Digital systems S	Communication Systems
	Zoology	Human anatomy and physiologys	Reproductive biology / Attractive insects	Industrial entomology	Fish farming	Animal husbandry	Bio-statistics / Communicable diseases
C	**Botany**	Bio fertilisers, bio-pesticides and compositing	Indoor gardening and landscaping	Sustainable agriculture	Hydroponics and Plant Growth Regulators	Nutraceuticals	Biofuels technology
	Mathematics	Quantitative aptitude	A. Basic Statistics / B. Basic Algebra and Geometry	A. Business statistics-I/ B. Business Mathematics-I	A. Business statistics-II / B. Business Mathematics -II	Basic Mathematics for Coding	Mathematics for Data Analysis
E	**Computer Science**	Computer fundamentals	Office Automation	Programming in C	Web Technologies	Database Management System S	Cyber security

Guidelines for Selection:

A student is required to select an Open Elective Course from the Open Elective Basket of any program offered by the university in any faculty before filling the examination form for the semester concerned. Such an 'Open Elective' cannot be selected from the subjects chosen by a student as 'Major' and 'Minor'subjects.

OR A student is allowed to earn credits for 'Open Elective Course' by successfully completing online courses of equivalent credits from SWAYAM / NPTEL learning platforms or from other higher education institutions affiliated to RTM Nagpur University. However, this needs to be informed by the student to the college before commencement of the semester and an application for transfer of credits is required to be made by student

Table - 5

Selection of Minor Courses

List of Minor Courses Available in the College for B.Sc. course only

Gr.	Major	Basket of Minor Semester wise						
		III		IV		V		VI
		Minor-1	Minor-2	Minor-3	Minor-4	Minor-5	Minor-6	Minor-7
A	Chemistry	Inorganic Chemisty-1 (Atomic structure, bonding and main group elements)	Organic Chemistry-1 (Fundamentals, stereochemistry and hydrosscarbons)	Organic Chemistry-2 (Functional group chemistry)	Physical Chemistry-1 (Thermodynamics, gaseous and liquid state)	Physical Chemistry-2 (Surface chemistry, phase equilibria, electrochemistry and kinetics)	Inorganic Chemistry-2 (Bonding, transition elements and solutions)	Inorganic Chemistry-3 (Coordination chemistry, Redox reactions and Inorganic Polymers)
B	Physics	Measurement, Mechanics, and Properties of Matter	Kinetic Theory of Gases and Thermodynamics	Acoustics and Ultrasonics	Oscillations and Blackbody radiations	Solid State Physics	Optics	Lasers and Optical Fibres
B	Zoology	Life and Diversity of Animals-Nonchordates (Protozoa to Annelida)	Cell Biology and Genetics	Life and Diversity of Animals-Nonchordates (Arthropoda to Hemichordata)	Developmental Biology	Chordata	General Mammalian Physiology	Applied Zoology
C	Botany	Biomolecules & Nutritional Biochemistry	Microbial Biochemistry	Human Physiology & Clinical Biochemistry	Techniques in Biochemistry	Agriculture Biochemistry	Enzymes and Enzyme Technology	Metabolism
C	Mathematics	Algebra and Trigonometry	Differential Calculus	Integral Calculus and Ordinary Differential Equations	Vector Analysis	Partial Differential Equations	Analytical Solid Geometry	Mathematical Methods
E	Computer Science	Programming in 'C'	Computer Fundamentals	Object Oriented Programming using 'C ++'	Operating Systems	Data Structures	Linux Operating System	Java Programming

Gusidelines for Selection of Minor Course: A student is required to select her / his 'Minor' subject from amongst the choices provided in this scheme of examination or any other degree program offered by the university in any faculty before filling the examination form for 3rd semester. Change of Minor subject shall not be permitted after the examination form for 3rd Semester is submitted.